# LECTURES

ON

# METAPHYSICS AND LOGIC

BY

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EDITED BY

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AND
JOHN VEITCH, M. A., EDINBURGH.

IN TWO VOLUMES.

VOL. II.

## LOGIC.

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24 71

ON EARTH, THERE IS NOTHING GREAT BUT MAN;
IN MAN, THERE IS NOTHING GREAT BUT MIND.

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# LECTURES

ON

# LOGIC

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NORMAL SCHOOL

EDITED BY THE

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NEW YORK:
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# AUTHORIZATION.

MESSRS. GOULD AND LINCOLN, OF BOSTON, UNITED STATES, ARE EXCLUSIVELY AUTHORIZED BY ME TO PUBLISH IN AMERICA THE LECTURES, METAPHYSICAL AND LOGICAL, OF THE LATE SIR WILLIAM HAMILTON, BART.

HUBERT HAMILTON.

16 Great King Street,
Edinburgh, 14 Sept., 1858.

# PREFACE.

THE Lectures comprised in the present Volume form the second and concluding portion of the Biennial Course on Metaphysics and Logic, which was commenced by Sir William Hamilton on his election to the Professorial Chair in 1836, and repeated, with but slight alterations, till his decease in 1856. The Appendix contains various papers, composed for the most part during this period, which, though portions of their contents were publicly taught at least as early as 1840, were only to a very small extent incorporated into the text of the Lectures.

The Lectures on Logic, like those on Metaphysics, were chiefly composed during the session in which they were first delivered (1837–8); and the statements made in the Preface to the previous volume, as regards the circumstances and manner of their composition, are equally applicable to the present course. In this, as in the preceding series, the Author has largely availed himself of the labors of previous writers, many of whom are but little known in this country. To the works of the German logicians of the present century, particularly to those of Krug and Esser, these Lectures are under special obligations.

In the compilation of the Appendix, some responsibility rests with the Editors; and a few words of explanation may be necessary as regards the manner in which they have attempted to perform this portion of their task. In publishing the papers of a deceased writer, composed at various intervals during a long period of years, and treating of difficult and controverted questions, there are two opposite dangers to be guarded against. On the one hand, there is the danger of compromising the Author's reputation by the publication of documents which his maturer judgment might not have sanctioned; and, on the other hand, there is the danger of committing an opposite injury to him and to the public, by withholding writings of interest and value. Had Sir William Hamilton, at any period of his life, published a systematic treatise on Logic, or had his projected *New Analytic of Logical Forms* been left in a state at all approaching to completeness, the Editors might probably have obtained a criterion by which to distinguish between those speculations which would have received the final *imprimatur* of their Author, and those which would not. In the absence of any such criterion, they have thought it better to run the risk of giving too much than too little ; — to publish whatever appeared to have any philosophical or historical interest, without being influenced by its coincidence with their own opinions, or by its coherence with other parts of the Author's writings. It is possible that, among the papers thus published, may be found some which are to be considered rather as experimental exercises than as approved results ; but no papers have been intentionally omitted, except such as were either too fragmentary to be intelligible, or manifestly imperfect sketches of what has been published here or elsewhere in a more matured form.

The Notes, in this as in the previous volume, are divided into three classes. Those printed from the manuscript of the Lectures appear without any distinctive mark ; those supplied from the Author's Commonplace-Book and other papers are enclosed within square brackets without signature ; and those added by the Editors are marked by the signature "Ed." These last, as in the Lectures on Metaphysics, are chiefly confined to occasional explanations of the text and verifications of references.

In conclusion, the Editors desire to express their acknowledgments to those friends from whom they have received assistance in tracing the numerous quotations and allusions scattered through this and the preceding volume. In particular, their thanks are due to Hubert Hamilton, Esq., whose researches among his father's books and papers have supplied them with many valuable materials; and to H. W. Chandler, Esq., Fellow of Pembroke College, Oxford, who has aided them from the resources of a philosophical learning cognate in many respects to that of Sir William Hamilton himself.

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# LECTURES ON LOGIC.

## LECTURE I.[*]

### INTRODUCTION.

### LOGIC—I. ITS DEFINITION.

Logic proper,—mode in which its consideration ought to be conducted.

GENTLEMEN:—We are now about to enter on the consideration of one of the most important branches of Mental Philosophy,—the science which is conversant about the Laws of Thought. But, before commencing the discussion, I would premise a word in regard to the mode in which it ought to be conducted, with a view to your information and improvement.

End of instruction.

The great end which every instructor ought to propose in the communication of a science, is, to afford the student clear and distinct notions of its several parts, of their relations to each other, and to the whole of which they are the constituents. For unless he accomplish this, it is of comparatively little moment that his information be in itself either new or important; for of what consequence are all the qualities of a doctrine, if that doctrine be not communicated?—and communicated it is not, if it be not understood.

Methods of written and oral instruction different.

But in the communication of a doctrine, the methods to be followed by an instructor who writes, and by an instructor who speaks, are not the same. They are, in fact, to a certain extent, necessarily different: for, while the reader of the one can always be referred back or forward, can always compare one part of a book with another, and can always meditate at leisure on each step of the evolution; the hearer of the other, on the contrary, must at every moment be prepared, by what has preceded, to comprehend at once what is to ensue. The oral instructor has thus a much more arduous problem to solve, in accomplishing the end which he proposes. For if, on the one hand, he avoid obscurity by communicating only what can easily be understood as isolated fragments, he is intelligible only because he communicates nothing worth learning: and if, on the other, he be unintelligible in proportion as his doctrine is concatenated and systematic, he equally fails in his attempt; for as, in the one case, there is nothing to teach, so, in the other, there is nothing taught. It is, therefore, evident, that the oral instructor must accommodate his mode of teaching to the circumstances under which he acts. He must endeavor to make his audience fully understand each step of his movement before another is attempted; and he must prepare them for details by a previous survey of generals. In short, what follows should always be seen to evolve itself out of what precedes. It is in consequence of this condition of oral instruction, that, where the development of a systematic doctrine is attempted in a course of Lectures, it is usual for the lecturer to facilitate the labor to his pupils and himself, by exhibiting in a Manual or Text-book the order of his doctrine and a summary of its contents. As I have not been able to prepare this useful subsidiary, I shall endeavor, as far as possible, to supply its want. I shall, in the first place, endeavor always to present you with a general statement of every doctrine to be explained, before descending to the details of explanation; and in order that you may be insured in distincter and more comprehensive notions, I shall, where it is possible, comprise the general statements in Propositions or Paragraphs, which I shall slowly dictate to you, in order that they may be fully taken down in writing. This being done, I shall proceed to analyze these propositions or paragraphs, and to explain their clauses in detail. This, I may observe, is the method followed in those countries where instruction by prelection is turned to the best account;—it is the one prevalent on the Continent, more especially in the universities of Germany and Holland.

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[*] The first seven Lectures of the Metaphysical Course (*Lectures on Metaphysics*, pp. 1–90) were delivered by Sir William Hamilton as a General Introduction to the Course of Logic proper.—ED.

Use of Text-book in a systematic course of Lectures.

Author's method of Prelection.

In pursuance of this plan, I at once commence by giving you, as the first proposition or paragraph, the following. I may notice, however, by parenthesis, that, as we may have sometimes occasion to refer articulately to these propositions, it would be proper for you to distinguish them by sign and number.

The first paragraph, then, is this:

Par. I. Of what a system of Logic consists.

¶ I. A System of Logical Instruction consists of Two Parts, — 1°, Of an Introduction to the science; 2°, Of a Body of Doctrine constituting the Science itself.

These, of course, are to be considered in their order.

Par. II. The Introduction to Logic.

¶ II. The Introduction to Logic should afford answers to the following questions: i. What is Logic? ii. What is its Value? iii. What are its Divisions? iv. What is its History? and, v. What is its Bibliography, that is, what are the best books upon the subject?

In regard to the first of these questions, it is evident that its answer is given in a definition of Logic. I therefore dictate to you the third paragraph.

Par. III. I. Definition of Logic.

¶ III. What is Logic? *Answer* — Logic is the Science of the Laws of Thought as Thought.

Explication.

This definition, however, cannot be understood without an articulate exposition of its several parts. I therefore proceed to this analysis and explanation, and shall consider it under the three following heads. In the first, I shall consider the meaning, and history, and synonyms of the word *Logic*. In the second, I shall consider the Genus of Logic, that is, explain why it is defined as a Science. In the third, I shall consider the Object-matter of Logic, that is, explain to you what is meant by saying, that it is conversant about the Laws of Thought as Thought.

1. The word *Logic* — (a) Its History.

First, then, in regard to the significance of the word. *Logic*, you are aware, is a Greek word, λογική; and λογική, like γραμματική, ῥητορική, ποιητική, διαλεκτική, I need hardly tell you, is an adjective, one or other of the substantives ἐπιστήμη, *science*, τέχνη, *art*, or πραγματεία, *study*, or rather *matter of study*, being understood. The term λογική, in this special signification, and as distinctly marking out a particular science, is not so old as the constitution of that science itself. Aristotle did not designate by the term λογική, the science whose doc-

Aristotle.

trine he first fully developed. He uses, indeed, the adjective λογικὸς in various combinations with other substantives. Thus I find in his *Physics*, λογικὴ ἀπορία,[1] — in his *Rhetoric*, λογικαὶ δυσχερείαι,[2] — in his *Metaphysics*, λογικὰς ἀποδείξεις,[3] — in his *Posterior Analytics*, ἔνια λογικά.[4] — in his *Topics*, λογικὸν πρόβλημα.[5] He, likewise, not unfrequently makes use of the adverb λογικῶς.[6] By whom the term λογική was first applied, as the word expressive of the science, does not appear. Boethius, who flourished at the close of the fifth and commencement of the sixth century, says, in his *Commentary on the Topics of Cicero*,[7] that the name of *Logic* was first given by the ancient Peripatetics. In the works of Alexander of Aphrodisias, the oldest commentator we possess on the works of Aristotle (he flourished towards the end of the second century), the term λογική, both absolutely and in combination with πραγματεία, etc., is frequently employed;[8] and the word is familiar in the writings of all the subsequent Aristotelians. Previously, however, to Alexander, it is evident that λογική had become a common designation of the science; for it is once and again thus applied by Cicero.[9] So much for the history of the word *Logic*, in so far as regards its introduction and earlier employment. We have now to consider its derivation and meaning.

Ancient Peripatetics.

Alexander of Aphrodisias.

Cicero.

b) Its derivation and meaning.

Twofold meaning of λόγος.

It is derived from λόγος, and it had primarily the same latitude and variety of signification as its original. What then did λόγος signify? In Greek this word had a twofold meaning. It denoted both thought and its expression; it was equivalent both to the *ratio* and to the *oratio* of the Latins. The

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[1] B. iii. c. 3. Ἔχει δ' ἀπορίαν λογικήν. "Dubitationem quæ non e rerum singularium (physicarum) contemplatione, sed e ratiocinatione sola orta est." Waitz, *ad Arist. Org.*, vol. ii. p. 354. *Logical* and *dialectical* reasoning in Aristotle mean the same thing, — viz., reasoning founded only on general principles of probability, not on necessary truths or on special experiences. — Ed.

[2] This expression occurs not in the *Rhetoric*, but in the *Metaphysics*, B. iii. (iv.) c. 3. and B. xiii. (xiv.) c. 1. In the *Rhetoric* we find the expression λογικοὶ συλλογισμοί B. i. c. 1. — Ed.

[3] B. xiii. (xiv.) c. 1. Cf. *De Gener. Anim.*, ii. 8. — Ed.

[4] B. i. c. 24. — Ed.

[5] B. v. c. 1. — Ed.

[6] E. g., *Anal. Post.*, i. 21, 32; *Phys.* viii. 8; *Metaph.*, vi. 4, 17; xi. 1. — Ed.

[7] L. i. *sub init.* — Ed.

[8] See, especially, his commentary on the *Prior Analytics*, f. 2 (*Scholia*, ed, Brandis, p. 141), where he divides ἡ λογική τε καὶ συλλογιστικὴ πραγματεία into four branches, ἀποδεικτική, διαλεκτική, πειραστική, and σοφιστική. Here *Logic* is used in a wider sense than the adjective and adverb bear in Aristotle, while the cognate term *dialectic* retains its original signification. — Ed.

[9] See *De Finibus*, i. 7; *Tusc. Quæst.*, iv. 14. Cicero probably borrowed this use of the term from the Stoics, to whose founder, Zeno, Laertius (vii. 39) ascribes the origin of the division of Philosophy into Logic, Physics, and Ethics, sometimes erroneously attributed to Plato. — Ed.

Greeks, in order to obviate the ambiguity thus arising from the confusion of two different things under one expression, were compelled to add a differential epithet to the common term. Aristotle, to contradistinguish λόγος, meaning *thought*, from λόγος, meaning *speech*, calls the former τὸν ἔσω, — τὸν ἐν τῇ ψυχῇ, — *that within*, — *that in the mind;* and the latter, τὸν ἔξω, — *that without.*[1] The same distinction came subsequently to be expressed by the λόγος ἐνδιάθετος, for *thought*, the *verbum mentis;* and by λόγος προφορικὸς, for *language*, the *verbum oris.*[2] It was necessary to give you this account of the ambiguity of the word λόγος, because the same passed into its derivative λογική; and it also was necessary that you should be made aware of the ambiguity in the name of the science, because this again exerted an influence on the views adopted in regard to the object-matter of the science.

How expressed by Aristotle.

By others.

Appellations of the science afterwards called *Logic*.

But what, it may be asked, was the appellation of the science before it had obtained the name of *Logic?* for, as I have said, the doctrine had been discriminated, and even carried to a very high perfection, before it received the designation by which it is now generally known. The most ancient name for what was subsequently denominated *Logic*, was *Dialectic.* But this must be understood with certain limitations. By Plato, the term *dialectic* is frequently employed to mark out a particular section of philosophy. But this section is, with Plato, not coëxtensive with the domain of Logic; it includes, indeed, Logic, but it does not exclude Metaphysic, for it is conversant not only about the form, but about the matter of our knowledge. (The meaning of these expressions you are soon to learn.)

Διαλεκτικὴ — its etymology.

This word, διαλεκτικὴ (τέχνη, or ἐπιστήμη, or πραγματεία, being understood) is derived, you are aware, from διαλέγεσθαι, *to hold conversation or discourse together;* *dialectic*, therefore, literally signifies, of a *conversation*, *colloquy*, *controversy*, *dispute.* But Plato, who defined thought an internal discourse of the soul with itself,[3] and who explained τὸ διαλέγεσθαι by the ambiguous expression τῷ λόγῳ

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[1] *Anal. Post.*, i. 10. — ED.

[2] E. g., Philo, *De Vita Mosis*, p. 672, edit. Paris, 1640; Plutarch, *Philos. esse cum principibus*, c. 2 (vol. ii. p. 777, C., ed. Francof., 1620); Sextus Empiricus, *Pyrrh. Hyp.*, i. 65; Simplicius, *In Categ. Arist.*, p. 7; Damascenus, *Fid. Orthod.*, ii. 21. The expressions probably originated with the Stoics. See Wyttenbach's note on Plutarch's *Moralia*, p 44 A (tom. vi. pars 1, p. 378, edit Oxon, 1810). — ED.

[3] Fishaber, p. 10. [*Lehrbuch der Logik*, Einleitung. See *Theætetus* p. 189. *Sophista*, p. 263 — ED.]

Use of the term *Dialectic* by Plato.

By Hegel.

Aristotle's employment of *Dialectic*.

Of *Analytic*, *Apodeictic*, *Topic*.

χρῆσθαι,[1] did not certainly do violence either to the Greek language or to his own opinions, in giving the name of *dialectic* to the process, not merely of logical inference, but of metaphysical speculation. In our own times, the Platonic signification of the word has been revived, and Hegel has applied it, in even a more restricted meaning, to metaphysical speculation alone.[2] But if Plato employed the term *Dialectic* to denote more than Logic, Aristotle employed it to denote less. With him, *Dialectic* is not a term for the pure science, or the science in general, but for a particular and an applied part. It means merely the Logic of Probable Matter, and is thus convertible with what he otherwise denominates *Topics* (τοπική).[3] This, I may observe, has been very generally misunderstood, and it is commonly supposed that Aristotle uses the term Dialectic in two meanings, — in one meaning for the science of Logic in general, in another for the Logic of Probabilities. This is, however, a mistake. There is, in fact, only a single passage in his writings, on the ground of which it can possibly be maintained that he ever employs *Dialectic* in the more extensive meaning. This is in his *Rhetoric* i. 1;[4] but the passage is not stringent, and *Dialectic* may there be plausibly interpreted in the more limited signification. But at any rate it is of no authority, for it is an evident interpolation, — a mere gloss which has crept in from the margin into the text.[5] Thus it appears that Aristotle possessed no single term by which to designate the general science of which he was the principal author and finisher. *Analytic*, and *Apodeictic* with *Topic* (equivalent to *Dialectic*, and including *Sophistic*), were so many special names by which he denoted particular parts, or particular applications of Logic. I say nothing of the vacillating and various employment of the terms *Logic* and *Dialectic* by the Stoics, Epicureans, and other ancient schools of philosophy; and now proceed to explain to you the second head of the definition, — viz., the Genus, — class, of Logic, which I gave as Science.

It was a point long keenly mooted by the old logicians, whether

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[1] I *Alcib.* p 129. ΣΩ. Τὸ δὲ διαλέγεσθαι καὶ τῷ λόγῳ χρῆσθαι ταὐτόν που καλεῖς; ΑΛ. Πάνυ γε. Cf Gassendi, *Logica*, Proœm. *Opera*, t i. p 32 — Ed

[2] See *Encyklopädie*, § 81. — Ed

[3] *Topica*, i. 1 Διαλεκτικὸς δὲ συλλογισμὸς ὁ ἐξ ἐνδόξων συλλογιζόμενος. — Ed.

[4] Περὶ δὲ συλλογισμοῦ ὁμοίως ἅπαντος τῆς διαλεκτικῆς ἐστιν ἰδεῖν ἢ αὐτῆς ὅλης ἢ μέρους τινός. — Ed

[5] See Balforeus. [*R. Balforei Commentarius in Organum Logicum Aristotelis*, Burdigalæ, 1618. Qu 11. § 3, p. 12. Muretus, in his version, omits this passage as an interpolation. — Ed.]

2. Logic — its Genus — whether Science or Art

Logic were a science, or an art, or neither, or both; and if a science, whether a science practical, or a science speculative, or at once speculative and practical. Plato and the Platonists viewed it as a science;[1] but with them Dialectic, as I have noticed, was coëxtensive with the Logic and Metaphysics of the Peripatetics taken together. By Aristotle himself Logic is not defined. The Greek Aristotelians, and many philosophers since the revival of letters, deny it to be either science or art.[2] The Stoics, in general, viewed it as a science;[3] and the same was done by the Arabian and Latin schoolmen.[4] In more modern times, however, many Aristotelians, all the Ramists, and a majority of the Cartesians, maintained it to be an art;[5] but a considerable party were found who defined it as both art and science.[6] In Germany, since the time of Leibnitz, Logic has been almost universally regarded as a science.

The question futile.

The controversy which has been waged on this point is perhaps one of the most futile in the history of speculation. In so far as Logic is concerned, the decision of the question is not of the very smallest import. It was not in consequence of any diversity of opinion in regard to the scope and nature of this doctrine, that philosophers disputed by what name it should be called. The controversy was, in fact, only about what was properly an art, and what was properly a science; and as men attached one meaning or another to these terms, so did they affirm Logic to be an art, or a science, or both, or neither. I should not, in fact, have thought it necessary to say anything on this head, were it not to guard you against some mistakes of the respectable author, whose work on Logic I have recommended to your attention, — I mean Dr. Whately.

Whately quoted.

In the opening sentence of his *Elements*, it is said: "Logic, in the most extensive sense which the name can with propriety be made to bear, may be considered as the Science, and also the Art of Reasoning. It investigates the principles on which argumentation is conducted, and furnishes rules to secure the mind from error in its deductions. Its most appropriate office, however, is that of instituting an analysis of the process of the mind in reasoning; and in this point of view it is, as has been stated, strictly a science; while mentioned in reference to the practical rules above mentioned, it may be called the art of reasoning. This distinction, as will hereafter appear, has been overlooked, or not clearly pointed out, by most writers on the subject; Logic having been in general regarded as merely an art, and its claim to hold a place among the sciences having been expressly denied."

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[1] [Camerarius, *Disputationes Philosophicæ*, p. 30] [Pars i qu. 3. ed. Parisiis, 1630. See also Qu. 4, p. 44 — Ed.]

[2] [See Themistius, *In Anal. Post.*, l i. c. 24, [*Opera*, p. 6, Venice, 1554. — Ed.] Ammonius Hermiæ, *In Categ.*. Præf. [p. 3, ed. Ald 1503. — Ed.] Simplicius. *In Categ.*. Præf. [§ 25, p. 5. ed. Basileæ. 1551. — Ed ] Zabarella. *De Natura Logicæ.* [l. i c 5, *et seq.* — Ed.] Smiglecius, *Logica*, Disp. ii. qu. 4. [p 69, ed. Oxonii, 1658 — Ed.] *Logica Conimbricensis*, [Tract i. § 1 subs. 4. *et seq*, p. 8, ed. 1711 — Ed ] Gerard John Vossius, *De Nat. Artium, sive de Logica*, c. vi ]

[3] [See Laertius, *In Vita Zenonis*, l. vii.] [§ 62. — Ed.]

[4] [Scotus. *Prædicamenta*, Qu. i. Albertus Magnus. *In De Prædicabilibus*, c. 1 ]

[5] [Ramus, *Instit. Dialect*, l. i. c. l. Burgersdicius. *Instit. Log.*, l. i. c. 1, [§ 4. — Ed.]

[6] See Smiglecius, as above. — Ed.

Criticized.

All this is, from first to last, erroneous. In the first place, it is erroneous in what it says of the opinion prevalent among philosophers, in regard to the genus of Logic. Logic was not, as is asserted, in general regarded as an art, and its claim to hold a place among the sciences expressly denied. The contrary would have been correct; for the immense majority of logicians, ancient and modern, have regarded Logic as a science, and expressly denied it to be an art. In the second place, supposing Dr. Whately's acceptation of the terms *art* and *science* to be correct, there is not a previous logician who would have dreamt of denying that, on such an acceptation, Logic was both a science and an art. But, in the third place, the discrimination itself of art and science is wrong. Dr. Whately considers science to be any knowledge viewed absolutely, and not in relation to practice, — a signification in which every art would, in its doctrinal part, be a science; and he defines art to be the application of knowledge to practice, in which sense Ethics, Politics, Religion, and all practical sciences, would be arts. The distinction of arts and sciences is thus wrong.[1] But, in the fourth place, were the distinction correct, it would be of no value, for it would distinguish nothing, since art and science would mark out no real difference between the various branches of knowledge, but only different points of view under which the same branch might be contemplated by us, — each being in different relations at once a science and an art. In fact, Dr. Whately confuses the distinction of science theoretical and science practical with the distinction of science and art. I am well aware that it would be no easy matter to give a general definition of science, as contradistinguished from art, and of art, as contradistinguished from science; but if the words themselves cannot validly be discriminated, it would be absurd to attempt to discriminate anything by them. When I, therefore, define Logic by the genus *science*, I do not attempt to give it more than the general denomination of a branch of knowledge; for I reserve the discrimination of its peculiar character to the differential quality afforded by its object-matter. You will find, when we have discussed the third head of the definition, that Logic is not only a science, but a demonstrative or apodictic science; but so to have defined it, would have been tautological; for a science conversant about laws is conversant about necessary matter, and a science conversant about necessary matter is demonstrative.

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[1] Compare *Lectures on Metaphysics*, p. 81 *et seq.* — ED.

3. LOGIC, — its object-matter

I proceed, therefore, to the third and last head of the definition, — to explain to you what is meant by the object-matter of Logic, — viz., the Laws of Thought as Thought. The consideration of this head naturally divides itself into three questions: 1, What is Thought? 2, What is Thought as Thought? 3, What are the Laws of Thought as Thought?

(a) Thought, — what.

In its wider and narrower meaning.

In the first place, then, in saying that Logic is conversant about Thought, we mean to say that it is conversant about thought strictly so called. The term *thought* is used in two significations of different extent. In the wider meaning, it denotes every cognitive act whatever; by some philosophers, as Descartes and his disciples, it is even used for every mental modification of which we are conscious, and thus includes the Feelings, the Volitions, and the Desires.[1] In the more limited meaning, it denotes only the acts of the Understanding properly so called, that is, of the Faculty of Comparison, or that which is distinguished as the Elaborative or Discursive Faculty.[2] It is in this more restricted signification that thought is said to be the object-matter of Logic.

Objects that lie beyond the sphere of Logic.

Thus Logic does not consider the laws which regulate the other powers of mind. It takes no immediate account of the faculties by which we acquire the rude materials of knowledge; it supposes these materials in possession, and considers only the manner of their elaboration. It takes no account, at least in the department of Pure Logic, of Memory and Imagination, or of the blind laws of Association, but confines its attention to connections regulated by the laws of intelligence. Finally, it does not consider the laws themselves of Intelligence as given in the Regulative Faculty, — Intelligence, — Common Sense; for in that faculty these laws are data, facts, ultimate and, consequently, inconceivable;

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[1] Descartes, *Principia*, p. i. § 9. "Cogitationis nomine intelligo illa omnia quæ nobis consciis in nobis fiunt, quatenus eorum in nobis conscientia est. Atque ita non modo intelligere, velle, imaginari, sed etiam sentire, idem est hic quod cogitare." — ED.

[2] See *Lectures on Metaphysics*, lect. xxxiv. p. 463. — ED.

but whatever transcends the sphere of the conceivable, transcends the sphere of Logic.

Such are the functions about which Logic is not conversant, and such, in the limited signification of the word, are the acts which are not denominated Thought. We have hitherto found what thought is not; we must now endeavor to determine generally what it is.

Thought proper

The contemplation of the world presents to our subsidiary faculties a multitude of objects. These objects are the rude materials submitted to elaboration by a higher and self-active faculty, which operates upon them in obedience to certain laws, and in conformity to certain ends. The operation of this faculty is Thought. All thought is a comparison, a recognition of similarity or difference; a conjunction or disjunction; — in other words, a synthesis or analysis of its objects. In Conception, that is, in the formation of concepts (or general notions), it compares, disjoins, or conjoins attributes; in an act of Judgment, it compares, disjoins, or conjoins concepts; in Reasoning, it compares, disjoins, or conjoins judgments. In each step of this process there is one essential element; to think, to compare, to conjoin, or disjoin, it is necessary to recognize one thing through or under another; and therefore, in defining Thought proper, we may either define it as an act of Comparison, or as a recognition of one notion as in or under another. It is in performing this act of thinking a thing under a general notion, that we are said to understand or comprehend it. For example: an object is presented, say a book; this object determines an impression, and I am even conscious of the impression, but without recognizing to myself what the thing is; in that case, there is only a perception, and not properly a thought. But suppose I do recognize it for what it is, in other words, compare it with, and reduce it under, a certain concept, class, or complement of attributes, which I call *book;* in that case, there is more than a perception, — there is a thought.

All this will, however, be fully explained to you in the sequel; at present I only attempt to give you a rude notion of what thinking is, to the end that you may be able vaguely to comprehend the limitation of Logic to a certain department of our cognitive functions, and what is meant by saying that Logic is a science of thought.

(b) Thought as thought — what

But Thought simply is still too undetermined; the proper object of Logic is something still more definite; it is not thought in general, but thought considered merely as thought, of which this science takes cognizance. This expression requires explanation; we come therefore to the second question, — What is meant by Thought as Thought?

To answer this question, let us remember what has just been said of the act constitutive of thought, — viz., that it is the recognition of a thing as coming under a concept; in other words, the marking an object by an attribute or attributes previously known as common to sundry objects, and to which we have accordingly given a general name. "In this process we are able, by abstraction, to distinguish from each other, — 1°, The object thought of: and, 2°, The kind and manner of thinking it. Let us, employing the old and established technical expressions, call the first of these the *matter*, the second the *form*, of the thought. For example, when I think that the book before me is a folio, the matter of this thought is book and folio; the form of it is a judgment. Now, it is abundantly evident that this analysis of thought into two phases or sides is only the work of a scientific discrimination and contrast; for as, on the one hand, the matter of which we think is only cogitable through a certain form, so, on the other, the form under which we think cannot be realized in consciousness, unless in actual application to an object."[1]

Matter and Form of Thought.

Now, when I said that Logic was conversant about thought considered merely as thought, I meant simply to say, that Logic is conversant with the form of thought, to the exclusion of the matter. This being understood, I now proceed to show how Logic only proposes — how Logic only can propose — the form of thought for its object of consideration. It is indeed true, that this limitation of Logic to the form of thought has not always been kept steadily in view by logicians; that it is only gradually that proper views of the science have been speculatively adopted, and still more gradually that they have been carried practically into effect, insomuch that to the present hour, as I shall hereafter show you, there are sundry doctrines still taught as logical, which, as relative to the matter of thought, are in fact foreign to the science of its form.

Logic properly conversant only with the Form of Thought.

"But although it is impossible to show by the history of the science, that Logic is conversant with the form, to the exclusion of the matter, of thought; this can, however, be satisfactorily done by a consideration of the nature and conditions of the thing itself. For, if it be maintained that Logic takes not merely the form, but the matter of thought into account

This shown by a consideration of the nature and conditions of the thing itself.

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[1] Esser, *Logik*, § 3, p. 4, 2d edit. Münster, 1830. — Ed.

(the matter, you will recollect, is a collective expression for the several objects about which thought is conversant), in that case, Logic must either consider all those objects without distinction, or make a selection of some alone. Now the former of these alternatives is manifestly impossible; for if it were required that Logic should comprise a full discussion of all cogitable objects, — in other words, if Logic must draw within its sphere all other sciences, and thus constitute itself in fact the one universal science, — every one at once perceives the absurdity of the requisition, and the impossibility of its fulfilment. But is the second alternative more reasonable? Can it be proposed to Logic to take cognizance of certain objects of thought to the exclusion of others? On this supposition, it must be shown why Logic should consider this particular object, and not also that; but as none but an arbitrary answer — that is, no answer at all — can be given to this interrogation, the absurdity of this alternative is no less manifest than that of the other. The particular objects, or the matter of thought, being thus excluded, the form of human thought alone remains as the object-matter of our science; in other words, Logic has only to do with thinking as thinking, and has no, at least no immediate, concernment with that which is thought about. Logic thus obtains, in common parlance, the appellation of a formal science, not indeed in the sense as if Logic had only a form and not an object, but simply because the form of human thought is the object of Logic; so that the title *formal science* is properly only an abbreviated expression."[1]

(c) The Laws of Thought as Thought.

I proceed now to the question under this head, — viz., What is meant by the Laws of Thought as Thought? in other words, What is meant by the Formal Laws of Thought?

We have already limited the object of Logic to the form of thought. But there is still required a last and final limitation; for this form contains more than Logic can legitimately consider. "Human thought, regarded merely in its formal relation, may be considered in a twofold point of view; for, on the one hand, it is either known to us merely from experience or observation, — we are merely aware of its phenomena historically or empirically, or, on the other, by a reflective speculation, — by analysis and abstraction, we seek out and discriminate in the manifestations of thought what is contained of necessary and universal. The empirical or historical consideration of our thinking faculty does not belong to Logic, but to the Phænomenology of Mind, — to Psychology. The empirical observation of the phenomena necessarily, indeed, precedes their speculative analysis. But, notwithstanding this, Logic possesses a peculiar province of its own, and constitutes an independent and exclusive science. For where our empirical consideration of the mind terminates, there our speculative consideration commences; the necessary elements which the latter secures from the contingent materials of observation, — these are what constitute the laws of thought as thought."[1]

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[1] Esser, *Logik*, § 3, pp. 5, 6. Cf. Krug, *Denklehre oder Logik*, § 8, p. 17 *et seq.*, 2d edit. 1819 — Ed.

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[1] Cf. Esser, *Logik*, § 4, pp. 6, 7. — Ed

# LECTURE II.

## INTRODUCTION.

### LOGIC — I. ITS DEFINITION — HISTORICAL NOTICES OF OPINIONS REGARDING ITS OBJECT AND DOMAIN — II. ITS UTILITY.

**Recapitulation.**

In my last Lecture I commenced the consideration of Logic, — of Logic properly so denominated, — a science for the cultivation of which every European university has provided a special chair, but which, in this country, in consequence of the misconceptions which have latterly arisen in regard to its nature and its end, has been very generally superseded; insomuch that, for a considerable period, the chairs of Logic in our Scottish universities have in fact taught almost everything except the doctrine which they were established to teach. After some precursory observations in regard to the mode of communication which I should follow in my Lectures on this subject, I entered on the treatment of the science itself, and stated to you that a systematic view of Logic would consist of two parts, the one being an Introduction to the doctrine, the other a body of the Doctrine itself. In the introduction were considered certain preparatory points, necessary to be understood before entering on the discussion of the science itself; and I stated that these preparatory points were, in relation to our science, exhausted in five questions and their answers — 1°, What is Logic? 2°, What is its value? 3°, How is it distributed? 4°, What is its history? 5°, What are its subsidiaries?

I then proceeded to the consideration of the first of these questions; and as the answer to the question, — what is Logic, — is given in its definition, I defined Logic to be the science conversant about the laws of thought considered merely as thought; warning you, however, that this definition could only be understood after an articulate explanation of its contents. Now this definition, I showed you, naturally fell into three parts, and each of these parts it behooved to consider and illustrate by itself. The first was the word significant of the thing defined, — *Logic*. The second was the genus by which Logic was defined, — science. The third was the object-matter constituting the differential quality of Logic, — the laws of thought as thought. Each of these I considered in its order. I, first of all, explained the original meaning of the term *Logic*, and gave you a brief history of its application. I then stated what was necessary, in regard to the genus, — science; and, lastly, what is of principal importance, I endeavored to make you vaguely aware of that which you cannot as yet be supposed competent distinctly to comprehend; I mean the peculiar character of the object, — object-matter, — about which Logic is conversant. The object of Logic, as stated in the definition, is the laws of thought as thought. This required an articulate explanation; and such an explanation I endeavored to afford you under three distinct heads; expounding, 1°, What was meant by thought; 2°, What was meant by thought as thought; 3°, What was meant by the laws of thought as thought.

In reference to the first head, I stated that Logic is conversant about thought taken in its stricter signification, that is, about thought considered as the operation of the Understanding Proper, or of that faculty which I distinguished as the Elaborative or Discursive, — the Faculty of Relations, or Comparison. I attempted to make you vaguely apprehend what is the essential characteristic of thought, — viz., the comprehension of a thing under a general notion or attribute. For such a comprehension enters into every act of the discursive faculty, in its different gradations of Conception, Judgment, and Reasoning. But by saying that Logic is conversant about thought proper, Logic is not yet discriminated as a peculiar science, for there are many sciences, likewise, *inter alia*, conversant about the operations and objects of the Elaborative Faculty. There is required a further determination of its object-matter. This is done by the limitation, that Logic is conversant not merely about thought, but about thought as thought. The explanation of this constituted the second head of our exposition of the object-matter. Thought, I showed, could be viewed, by an analytic abstraction, on two sides or phases. We could either consider the object thought, or the manner of thinking it; in other words, we could scientifically distinguish from each other the matter and the form of thought. Not that the matter and form have any separate existence; no object being cogitable except under some form of thought, and no form of thought having any existence in consciousness except some object be thought under it. This, however, formed no impediment to our analysis of these elements, through a mental abstraction. This is in fact only one of a thousand similar abstractions we are in the habit of making; and if such were impossible, all human science would be impossible. For example: extension is only presented to sense, under some modification of color, and even imagination cannot represent extension except as colored. We may view it in phantasy as black or white, as translucent or opaque; but represent it we cannot, except either under some positive variety of light, or under the negation of light, which is darkness. But, psychologically considered, darkness or blackness is as much a color, that is, a positive sensation, as whiteness or redness; and thus we cannot image to ourselves aught extended, not even space itself, out of relation to color. But is this inability even to imagine extension, apart from some color, any hinderance to our considering it scientifically apart from all color? Not in the smallest; nor do Mathematics and the other sciences find any difficulty in treating of extension, without even a single reference to this condition of its actual manifestation. The case of Logic is precisely the same. Logic considers the form apart from the matter of thought; and it is able to do this without any trouble; for though the form is only an actual phænomenon when applied to some matter, — object, — yet, as it is not necessarily astricted to any object, we can always consider it abstract from all objects; in other words, from all matter. For as the mathematician, who cannot construct his diagrams, either to sense or to imagination, apart from some particular color, is still able to consider the properties of extension apart from all color; so the logician, though he cannot concretely represent the forms of thought except in examples of some particular matter, is still able to consider the properties of these forms apart from all matter. The possibility being thus apparent of a consideration of the form abstractly from the matter of thought, I showed you that such an abstraction was necessary. The objects (the matter) of thought are infinite; no one science can embrace them all, and therefore, to suppose Logic conversant about the matter of thought in general, is to say that Logic is another name for the encyclopædia — the *omne scibile* — of human knowledge. The absurdity of this supposition is apparent. But if it be impossible for Logic to treat of all the objects of thought, it cannot be supposed that it treats of any; for no reason can be given why it should limit its consideration to some, to the exclusion of others. As Logic cannot, therefore, possibly include all objects, and as it cannot possibly be shown why it should include only some, it follows that it must exclude from its domain the consideration of the matter of thought altogether; and as, apart from the matter of thought, there only remains the form, it follows that Logic, as a special science of thought, must be viewed as conversant exclusively about the form of thought.

But the limitation of the object-matter of Logic to the form of

(c) The Laws of Thought as Thought.

thought (and the expression *form of thought* is convertible with the expression *thought as thought*), is not yet enough to discriminate its province from that of other sciences; for Psychology, or the Empirical Science of Mind, is likewise, among the other mental phænomena, conversant about the phænomena of formal thought. A still further limitation is therefore requisite; and this is given in saying that Logic is the science not merely of Thought as Thought, but of the Laws of Thought as Thought. It is this determination which affords the proximate and peculiar difference of Logic, in contradistinction from all other sciences; and the explanation of its meaning constituted the third head of illustration, which the object-matter in the definition demanded.

The phænomena of formal thought are of two kinds—contingent and necessary.

The phænomena of the formal, or subjective phases of thought, are of two kinds. They are either such as are contingent, that is, such as may or may not appear; or they are such as are necessary, that is, such as cannot but appear. These two classes of phænomena are, however, only manifested in conjunction; they are not discriminated in the actual operations of thought; and it requires a speculative analysis to separate them into their several classes. In so far as these phænomena are considered merely as phænomena, that is, in so far as philosophy is merely observant of them as manifestations in general, they belong to the science of Empirical or Historical Psychology. But when philosophy, by a reflective abstraction, analyzes the necessary from the contingent forms of thought, there results a science, which is distinguished from all others by taking for its object-matter the former of these classes; and this science is Logic. Logic, therefore, is at last fully and finally defined as the science of the necessary forms of thought. Here terminated our last Lecture. But though full and final, this definition is not explicit; and it still remains to evolve it into a more precise expression.

Now, when we say that Logic is the science of the necessary forms of thought, what does the quality of necessity here imply?

Form of thought.—Four conditions of its necessity.

1. Determined by the nature of the thinking subject itself.

"In the first place, it is evident that in so far as a form of thought is necessary, this form must be determined or necessitated by the nature of the thinking subject itself; for if it were determined by anything external to the mind, then would it not be a necessary, but a merely contingent determination. The first condition, therefore, of the necessity of a form of thought is, that it is subjectively, not objectively, determined.

2. Original.

"In the second place, if a form of thought be subjectively necessary, it must be original and not acquired. For if it were acquired, there must have been a time when it did not exist; but if it did ever actually not exist, we must be able at least to conceive the possibility of its not existing now. But if we are so able, then is the form not necessary; for the criterion of a contingent cognition is, that we can represent to ourselves the possibility of its non-existence. The second condition, therefore, of the necessity of a form of thought is, that it is original, and not acquired.

3. Universal.

"In the third place, if a form of thought be necessary and original, it must be universal; that is, it cannot be that it necessitates on some occasions, and does not necessitate on others. For if it did not necessitate universally, then would its necessitation be contingent, and it would consequently not be an original and necessary principle of mind. The third condition, therefore, of the necessity of a form of thought is, that it is universal.

4. A law.

"In the fourth place, if a form of thought be necessary and universal, it must be a law; for a law is that which applies to all cases without exception, and from which a deviation is ever, and everywhere, impossible, or, at least, unallowed. The fourth and last condition, therefore, of the necessity of a form of thought is, that it is a law."[1] This last condition, likewise, enables us to give the most explicit enunciation of the object-matter of Logic, in saying that Logic is the science of the Laws of Thought as Thought, or the science of the Formal Laws of Thought, or the science of the Laws of the Form of Thought; for all these are merely various expressions of the same thing.

The Object-matter of Logic explicitly enounced.

General historical retrospect of views in regard to the object and domain of Logic.

Before proceeding further, it may be proper to take a very general retrospect of the views that have prevailed in regard to the object and domain of Logic, from the era when the science received its first grand and distinctive development from the genius of Aristotle to the present time.

Merit of the Author's view of Logic.

I may say, in general, that the view which I have now presented to you of the object and domain of Logic, is the one which concentrates, corrects, and completes the views which have been generally held by logicians of the peculiar province of their science. It is the one to which they all gravitate.

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[1] Esser, *Logik*, § 6, pp. 9, 10, with a few original interpolations. — Ed

Aristotle.

It is unfortunate, that by far the greater number of the logical writings of Aristotle have perished, and that those which remain to us exhibit only his views of the science considered in its parts, or in certain special relations. None of the treatises which are now collected in the *Organon*,[1] considers the science from a central point; and we do not even possess a general definition of Logic by its illustrious founder. It would, therefore, be unjust to the mighty master, if, as has usually been done, we estimated his conception of the science only by the partial views contained in the fragmentary or special treatises which have chanced to float ashore from the general wreck of his logical writings. These by themselves are certainly enough to place the Stagirite high above comparison with any subsequent logician; but still, if he has done so much in the half-dozen treatises that still remain, what may we not conceive him to have accomplished in the forty which are recorded and seem to have been lost? It is, therefore, not to be attributed to Aristotle, that subsequent logicians, mistaking his surviving treatises of a logical nature — few in number, and written, in general, not in exposition of the pure science, but only of the science in certain modified applications — for a systematic body of logical doctrine, should have allowed his views of its partial relations to influence their conceptions of the science absolutely and as a whole. By this influence of the Aristotelic treatises, we may explain the singular circumstance, that, while many, indeed most, of the subsequent logicians speculatively held the soundest views in regard to the proper object and end of Logic, few or none of them have attempted by these views to purify the science of those extraneous doctrines, to which the authority of Aristotle seemed to have given a right of occupancy within its domain.

Greek Aristotelians and Latin Schoolmen.

I shall not attempt to show you, *in extenso*, how correct, in general, were the notions entertained by the Greek Aristotelians, and even by the Latin schoolmen, for this would require an explanation of the signification of the terms in which their opinions were embodied, which would lead me into details which the importance of the matter would hardly warrant. I shall only say, in general, that, in their multifarious controversies under this head, the diversity of their opinions on subordinate points is not more remarkable than their unanimity on principal. Logic they all discriminated as a science of the form and not of the matter of thought.[1] Those of the schoolmen who held the object of Logic to be things in general, held this, however, under the qualification that things in general were not immediately and in themselves considered by the logician, but only as they stood under the general forms imposed on them by the intellect ("quatenus secundis intentionibus substabant"), — a mode of speaking which is only a periphrasis of our assertion, that Logic is conversant about the forms of thought.[2] The other schoolmen, again, who maintained that the object of Logic was thought in its processes of simple apprehension, judgment, and reasoning (three, two, or one), carefully explained that these operations were not in their own nature proposed to the logician, for as such they belonged to Animastic, as they called it, or Psychology, but only in so far as they were dirigible or subject to laws, — a statement which is only a less simple expression of the fact, that Logic is the science of the laws of thought.[3] Finally, those schoolmen who held that the object-matter of Logic was found in second notions as applied to first, only meant to say that Logic was conversant with conceptions, judgments and reasonings, not in themselves, but only as regulators of thought,[4] — a statement which merely varies and perplexes the expression, that the object of Logic is the formal laws of thought.

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[1] See below, p. 24. — ED.

Leibnitio-Wolfian and Kantian Schools.

The same views, various in appearance, but, when analyzed, essentially the same, and essentially correct, may be traced through the Leibnitio-Wolfian school into the Kantian; so that, while it must be owned that they were never adequately carried out into practical application, it cannot be denied that they were theoretically not unsound.

Bacon, — Locke.

The country in which, perhaps, the nature of Logic has been most completely and generally misunderstood, is Great Britain. Bacon wholly misconceived its character in certain respects; but his errors are insignificant, when compared with the total misapprehension of its nature by Locke. The character of these mistakes I shall have occasion to illustrate in the sequel; at present I need only say, that, while those who, till lately, attempted to write on Logic in the English language were otherwise wholly incompetent to the task, they, at the same time, either shared the misconceptions of its nature with Locke, or only contributed, by their own hapless attempts, to justify the prejudices prevalent against the science which they professed to cultivate and improve.

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[1] "Logicus solas considerat formas intentionum communes." Albertus Magnus, *In De Anima*, L. I. trac. i. c. 8. For various scholastic theories on the object-matter of Logic, see Scotus, *Super Univ. Porphyrii*, Qu. iii.; Zabarella, *De Natura Logicæ*, lib. i. cap. 10; Smiglecius, *Logica*, Disp. ii. qu. 1; Camerarius, *Disputationes Philosophicæ*, Pars i. qu. 1, p. 2, et seq. Compare *Discussions*, p. 138. — Ed.

[2] [Cf. J. Vossius, *De Nat. Artium sive De Logica*, c. i.] Compare Alex. de Ales, *In Metaph.*, l. iv. t. 5. "Dialectica est inventa ad regulandum discursum intellectus et rationis; ideo quædam secundæ intentiones inventæ sunt ad regulandum discursum, de quibus proprie est Logica." See also Zabarella and Camerarius as above. — Ed.

[3] [Camerarius, *Disp. Phil.*, P. i. qu. 1, p. 3. — Ed.] Schuler, *Philosophia*, p. 307, [L. v., *Logica*, Exer. i., ed. Hagae Comitis, 1763. — Ed.] D'Abra de Raconis, [*Tractatio Totius Philosophiæ*, *Præludia Logica*, Post., c. i. p. 48, ed. Parisiis, 1640. — Ed.]

[4] See Zabarella and Camerarius, as above. — Ed. [Compare Poncius, *Cursus Philosophicus*, Disp. i. qu. ult., p. 48, 2d ed. Paris, 1649.]

Whately, — general character of his Elements.

It would be unjust to confound with other attempts of our countrymen in logical science the work of Dr. Whately. The author, if not endowed with any high talent for philosophical speculation, possesses at least a sound and vigorous understanding. He unfortunately, however, wrote his *Elements of Logic* in singular unacquaintance with all that had been written on the science in ancient and in modern times, with the exception, apparently, of two works of two Oxford logicians, — the *Institutio* of Wallis, and the *Compendium* of Aldrich, — both written above a century ago, neither of them rising above a humble mediocrity, even at the date of its composition; and Aldrich, whom Whately unfortunately regards as a safe and learned guide, had himself written his book in ignorance of Aristotle and of all the principal authors on the science, — an ignorance manifested by the grossest errors in the most elementary parts of the science. It is not, therefore, to be wondered at, that the *Elements* of Whately, though the production of an able man, are so far behind the advancement of the science of which they treat; that they are deformed with numerous and serious errors; and that the only recommendation they possess, is that of being the best book on the subject in a language which has absolutely no other deserving of notice![1]

Wallis.
Aldrich.

Whately's view of the object-matter and domain of Logic stated and criticized.

I have now, therefore, to call your attention to Dr. Whately's account of the object-matter and domain of Logic. "The treatise of Dr. Whately," says his Vice-Principal and epitomator Dr. Hinds,[2] "displays, and it is the only one that has clearly done so, the true nature and use of Logic; so that it may be approached no longer as a dark, curious, and merely speculative study, such as one is apt in fancy to class with astrology, and alchemy."

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[1] See *Discussions*, p. 128, second edition, foot-note.

[2] *Introduction to Logic*, Preface. p. viii. Oxford, 1827. — ED.

Let us try whether this eulogy be as merited as it is unmeasured.

Whately proposes to Logic different and contradictory object-matter.

Now, Dr. Whately cannot truly be said clearly to display the nature of Logic, because in different passages he proposes to it different and contradictory objects; and he cannot be said to display the true nature of Logic, for of these different objects there is not one which is the true.

In several passages,[1] he says that "the process or operation of reasoning is alone the appropriate province of Logic." Now, this statement is incorrect in two respects. In the first place, it is incorrect, inasmuch as it limits the object-matter of Logic to that part of the Discursive Faculty which is especially denominated Reasoning. In this view Logic is made convertible with Syllogistic. This is an old error, which has been frequently refuted, and into which Whately seems to have been led by his guide Dr. Wallis.

The operation of Reasoning not the object-matter of Logic, as Whately affirms.

In the second place, this statement is incorrect, inasmuch as it makes the process, or, as he also calls it, the operation, of reasoning the object-matter of Logic. Now, a definition which merely affirms that Logic is the science which has the process of reasoning for its object, is not a definition of this science at all; it does not contain the differential quality by which Logic is discriminated from other sciences; and it does not prevent the most erroneous opinions (it even suggests them) from being taken up in regard to its nature. Other sciences, as Psychology and Metaphysic, propose for their object (among the other faculties) the operation of reasoning, but this considered in its real nature: Logic, on the contrary, has the same for its object, but only in its formal capacity; in fact, it has in propriety of speech nothing to do with the process or operation, but is conversant only with its laws. Dr. Whately's definition is therefore not only incompetent, but delusive; it would confound Logic and Psychology and Metaphysic, and tend to perpetuate the misconceptions in regard to the nature of Logic which have been so long prevalent in this country.

Whately erroneously and contradictorily makes Language the adequate object-matter of Logic.

But Dr. Whately is not only wrong as measured by a foreign standard, he is wrong as measured by his own; he is himself contradictory. You have just seen that, in some places, he makes the operation of reasoning not only the principal but the adequate object of Logic. Well, in others he makes this total or adequate object to be language. But as there cannot be two adequate objects, and as language and the operation of reasoning are not the same, there is, therefore, a contradiction. "In introducing," he says, "the mention of language previously to the definition of logic, I have departed from established practice, in order that it may be clearly understood that logic is entirely conversant about language; a truth which most writers on the subject, if indeed they were fully aware of it themselves, have certainly not taken due care to impress on their readers."[1] And again: "Logic is wholly concerned in the use of language."[2]

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[1] See pp. 1, 13, 140, third edition.

In our last Lecture, I called your attention to the ambiguity of the term λόγος, in Greek, meaning ambiguously either thought or its expression; and this ambiguity favored the rise of two counter-opinions in regard to the object of logic; for while it was generally and correctly held to be immediately conversant about the internal λόγος, *thought*, some, however, on the contrary, maintained that it was immediately conversant about the external λόγος, *language*. Now, by some unaccountable illusion, Dr. Whately, in different places, adopts these opposite opinions, and enunciates them without a word of explanation, or without even a suspicion that they are contradictory of each other.[3]

The true nature of Logic more correctly understood by the scholastic logicians than by Whately.

From what I have now said, you may, in some degree, be able to judge how far credit is to be accorded to the assertion, that Dr. Whately is the only logician who ever clearly displayed the true nature and use of Logic. In fact, so far is this assertion from the truth, that the object-matter and scope of Logic was far more correctly understood even by the scholastic logicians than by Dr. Whately; and I may caution you, by the way, that what you may find stated in the *Elements* of the views of the schoolmen touching the nature and end of Logic, is in general wrong; in particular, I may notice one most erroneous allegation, that the schoolmen "attempted to employ logic for the purpose of physical discovery."

But if, compared only with the older logicians, the assertion of Dr. Hinds is found untenable, what will it be found, if we compare Whately with the logicians of the Kantian and Leibnitian schools, of whose writings neither the Archbishop nor his abbreviator seems ever to have heard? And here I may observe, that Great Britain is, I believe, the only country of Europe in which books are written by respectable authors upon sciences, of the progress of which, for above a century, they have never taken the trouble to inform themselves.

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[1] Page 56.

[2] Page 74.

[3] Besides most vague. — *Jotting*.

II. The Utility of Logic.

The second question, to which in the Introduction to Logic an answer is required, is, — What is the Value or Utility of this science? Before proceeding to a special consideration of this question, it may be proper to observe, in general, that the real utility of Logic has been obscured and disparaged by the false utilities which have too frequently been arrogated to it; for when logic was found unable to accomplish what its unwise encomiasts had promised, the recoil was natural, and as it failed in performing everything, it was lightly inferred that it could perform nothing. Both of these extremes are equally erroneous. There is that which Logic can, and there is that which Logic cannot, perform; and, therefore, before attempting to show what it is that we ought to expect from the study of this science, it will be proper to show what it is that we ought not. I shall therefore, in the first place, consider its false utilities, and, in the second, its true.

Utilities falsely attributed to Logic.

The attribution of every false utility to Logic has arisen from erroneous opinions held in regard to the object of the science. So long as it was supposed that logic took any cognizance of the matter of thought, — so long as it was not distinctly understood that the form of thought was the exclusive object of this science, and so long as it was not disencumbered of its extraneous lumber, — so long must erroneous opinions have been prevalent as to the nature and comprehension of its end.

As an instrument of scientific discovery.

It was accordingly, in the first place, frequently supposed that Logic was, in a certain sort, an instrument of scientific discovery. The title of *Organon*, — *instrument*, — bestowed on the collection we possess of the logical treatises of Aristotle, contributed to this error. These treatises, as I observed, are but a few of the many writings of the Stagirite on Logic, and to him we owe neither the order in which they stand arranged, nor the general name under which they are now comprehended.[1] In later times, these treatises were supposed to contain a complete system of Logic, and Logic was viewed as the organ not only of Philosophy, but of the sciences in general. Thus it was that Logic obtained not only the name of *instrument*, or *instrumental philosophy*, but many other high-sound-ing titles. It was long generally styled the *Art of arts and Science of sciences.* "Logica," says Scotus, "est ars artium et scientia scientiarum, qua aperta, omnes aliæ aperiuntur; et qua clausa, omnes aliæ clauduntur; cum qua quælibet, sine qua nulla."[1] In modern times, we have systems of this science under the titles of *Via ad Veritatem*[2] — *Cynosura Veritatis*[3] — *Caput et Apex Philosophiæ*[4] — *Heuristica, sive Introductio ad Artem Inveniendi*,[5] etc. But it was not only viewed as an instrument of discovery, it was likewise held to be the infallible corrector of our intellectual vices, the invigorator of our intellectual imbecility. Hence some entitled their Logics, *The Medicine of the Mind*,[6] *The Art of Thinking*,[7] *The Lighthouse of the Intellect*,[8] *The Science teaching the Right Use of Reason*,[9] etc., etc. Now, in all this there is a mixture of truth and error. To a certain extent, and in certain points of view, Logic is the organ of philosophy, the criterion of truth, and the corrector of error, and in others it is not.

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[1] See Brandis *Aristoteles, seine akademischen Zeitgenossen und nachsten Nachfolger*, P. i. p. 140. Trendelenburg, *Elementa Log. Aristot.*, p. 38. — Ed.

As the corrector of intellectual vices.

In what respect Logic is an instrument of the sciences.

In reference to the dispute, whether logic may with propriety be called the *instrument*, the *organon* of the other sciences, the question may be at once solved by a distinction. One science may be styled the instrument of another, either in a material or in a formal point of view. In the former point of view. one science is the organ of another when one science determines for another its contents or objects. Thus Mathematics may be called the material instrument of the various branches of physical science; Philology — or study of the languages, Latin, Greek, Hebrew, Chaldee, etc., with a knowledge of their relative history — constitutes a material instrument to Christian Theology; and the jurist, in like manner, finds a material instrument in a knowledge of the history of the country whose laws he expounds.[10] Thus, also, Physiology, in a material point of view, is the organon of medicine; Aristotle has indeed well said, that medicine begins where the philosophy of nature leaves off.[1] In the latter point of view, one science is the organon of another, when one science determines the scientific form of another. Now, as it is generally admitted that Logic stands in this relation to the other sciences, as it appertains to Logic to consider the general doctrine of Method and of systematic construction, in this respect Logic may be properly allowed to be to the sciences an instrument, but only a formal instrument.[2]

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[1] *Mauritii Expositio Quæstionum Doctoris Subtilis in quinque Universalia Porphyrii*, Quæst. i (*Scoti Opera*, Lugd. 1639, tom. i. p. 434.) Mauritius refers to St Augustin as his authority for the above quotation. It slightly resembles a passage in the *De Ordine*, l. ii. c. 13. — ED.

[2] Gundling, *Via ad Veritatem Moralem*, Halæ, 1713 Daries, *Via ad Veritatem*, Jenae, 1764 (2d edit). — ED.

[3] P. Laurembergius, *Cynosura Bonæ Mentis s. Logica* Rostoch, 1633. R Loenus, *Cynosura Rationis*, Arnhem. 1657. — ED.

[4] See Krug, *Logik*, § 9, p. 23. from whom several of the above definitions were probably taken. — ED.

[5] Gunner, *Ars Heuristica Intellectualis*, Lipsiæ, 1756. *Trattato di Messer Sebastiano Erizzo, dell' Instrumento et Via Inventrice de gli antichi nelle scientie*, Venice, 1554. — ED.

[6] Tschirnhausen, *Medicina Mentis, sive Artis Inveniendi Præcepta Generalia*, Amst. 1687. Lange, *Medicina Mentis*, Halæ, 1703. — ED.

[7] *L'Art de Penser*, commonly known as the Port Royal Logic. Several other works have appeared under the same title. — ED.

[8] Grosserus, *Pharus intellectus, sive Logica Electiva*, Lips., 1697. — ED

[9] Watts, *Logic, or the Right Use of Reason*. — ED.

[10] See Genovesi, p 41, [*Elementorum Artis Logico-Criticæ Libri V.*, l. i. c. iii. — ED.]

Logic not properly an art of discovery.

In regard to the other titles of honor, Logic cannot with propriety be denominated a [Heuretic or] Art of Discovery. "For discovery or invention is not to be taught by rules, but is either the free act of an original genius, or the consequence of a lucky accident, which either conducts the finder to something unknown, or gives him the impulse to seek it out. Logic can at best only analytically teach how to discover, that is, by the development and dismemberment of what is already discovered. By this process there is nothing new evolved, and our knowledge is not amplified; all that is accomplished is a clearer and distincter comprehension of the old; our knowledge is purified and systematized."[3] It is well observed by Antonius, in Cicero: "Nullum est præceptum in hac arte quomodo verum inveniatur, sed tantum est, quomodo judicetur."[4] Logic is thus not creative; it is only plastic, only formative, in relation to our knowledge.

In what sense Logic can be styled the medicine of the mind.

Again: "Logic cannot with propriety be styled the medicine of the mind, at least without some qualifying adjective, to show that the only remedy it can apply is to our formal errors, while our material errors lie beyond its reach. This is evident. Logic is the science of the formal laws of thought. But we cannot, in limiting our consideration to the laws of formal thinking, investigate the contents, — the matter of our thought. Logic can, therefore, only propose to purge the understanding of those errors which lie in the confusion and perplexities of an inconsequent thinking. This, however, it must be confessed, is no radical cure, but merely a purification of the understanding. In this respect, however, and to this extent, Logic may justly pretend to be the medicine of the mind, and may therefore, in a formal relation, be styled, as by some logicians it has in fact been, *Catharticon intellectus.*

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[1] *De Sensu et Sensili*, c. 1.

[2] Krug, *Logik*, § 9. p. 23: Cf. Platner, *Philosophische Aphorismen*, Pt. i. p. 23, ed. 1793.—Ed.

[3] Krug, *Logik*, § 9, p. 24. — Ed. Cf. [Richter, *Logik*, p. 83 *et seq.*]

[4] *De Oratore*, ii. 38. — Ed.

"By these observations the value of Logic is not depreciated; they only prepare us to form an estimate of its real amount. Precisely, in fact, as too much was promised and expected from this study, did it lose in credit and esteem."[1]

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[1] Krug, *Logik*, § 9, pp. 24-6. — ED. Cf. [Richter, *Logik*, p. 85.]

# LECTURE III.

## INTRODUCTION.

### LOGIC — II. ITS UTILITY — III. ITS DIVISIONS — SUBJECTIVE AND OBJECTIVE — GENERAL AND SPECIAL.

Recapitulation.

THE last Lecture was occupied with the consideration of the latter part of the introductory question, — What is Logic? and with that of the first part of the second, — What is its Utility? In the Lecture preceding the last, I had given the definition of Logic, as the science of the laws of thought as thought, and, taking the several parts of this definition, had articulately explained, 1°, What was the meaning and history of the word *Logic;* 2°, What was the import of the term *science*, the genus of Logic; and, 3°, What was signified by laws of thought as thought, the object-matter of Logic. This last I had considered under three heads, explaining, 1°, What is meant by *thought;* 2°, What is meant by *thought as thought;* and, 3°, What is meant by *laws of thought as thought.* It was under the last of these heads that the last Lecture commenced. I had, in the preceding, shown that the form of thought comprises two kinds of phænomena, given always in conjunction, but that we are able by abstraction and analysis to discriminate them from each other. The one of these classes comprehends what is contingent, the other what is necessary, in the manifestations of thought. The necessary element is the peculiar and exclusive object of Logic; whereas the phænomena of thought and of mind in general are indiscriminately proposed to Psychology. Logic, therefore, I said, is distinguished from the other philosophical sciences by its definition, as the science of the necessary form of thought. This, however, though a full and final definition, is capable of a still more explicit enunciation; and I showed how we are entitled to convert the term *necessary* into the term *laws;* and, in doing so, I took the opportunity of explaining how, the necessity of a mental element being given, there is also implicitly given the four conditions, 1°, That it is subjective; 2°, That it is original; 3°, That it is universal; and, 4°, That it is a law. The full and explicit definition of Logic, therefore, is, — the science of the Laws of Thought as Thought; or, the science of the Laws of the Form of Thought; or, the science of the Formal Laws of Thought; — these being only three various expressions of what is really the same.

Logic being thus defined, I gave a brief and general retrospect of the history of opinion in regard to the proper object and domain of Logic, and showed how, though most logicians had taken, speculatively and in general, a very correct view of the nature of their science, they had not carried this view out into application, by excluding from the sphere of Pure and Abstract Logic all not strictly relative to the form of thought, but had allowed many doctrines relative merely to the matter of thought to complicate and to deform the science.

I then called attention to the opinions of the author whom I recommend to your attention, and showed that Dr. Whately, in his statements relative to the object-matter of Logic, is vague and obscure, erroneous and self-contradictory; and that so far from being entitled to the praise of having been the only logician who has clearly displayed the true nature of the science, on the contrary, in the exposition of this nature, he is far inferior, not only in perspicuity and precision, but in truth, to the logicians of almost every age and country except our own.

Observations interposed relative to the question, — What is Logic?

And here, taking a view of what we have already established, I would interpolate some observations which I ought in my last Lecture to have made, before leaving the consideration of the first question, — viz., What is Logic? Logic, we have seen, is exclusively conversant about thought, — about thought considered strictly as the operation of Comparison, or the faculty of Relations; and thought, in this restricted signification, is the cognition of any mental object by another in which it is considered as included; — in other words, thought is the knowledge of things under conceptions. By the way, I would here pause to make an observation upon the word *conception*, and to prepare you for the employment of a term which I mean hereafter to adopt. You are aware, from what I have already said, that I do not use *conception* in the signification in which it is applied by Mr. Stewart. He usurps it in a very limited meaning, in a meaning which is peculiar to himself, — viz., for the simple and unmodified representation of an object presented in Perception.[1] Reid, again, vacillates in the signification he attaches to this term, — using it sometimes as a

The terms *Conception* and *Concept*.

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[1] See *Lectures on Metaphysics*, lect. xxxiii. p. 452. — ED.

synonym for Imagination, sometimes as comprehending not only Imagination, but Understanding and the object of Understanding.[1]

Author's employment of these terms

It is in the latter relation alone that I ever employ it, and this is its correct and genuine signification, whether we regard the derivation of the word, or its general use by philosophers. *Conception*, in English, is equivalent to *conceptio* and *conceptus* in Latin; and these terms, by the best philosophers, and the most extensive schools, have been employed as synonymous for *notion* (*notio*), the act or object of the Understanding Proper, or Faculty of Relations. So far, therefore, you are sufficiently prepared not to attribute to the word *conception*, when you hear it from me, the meaning which it bears in the philosophical writings with which you are most likely to be familiar. What is the precise meaning of the term will be soon fully explained in its proper place, when we commence the treatment of Logic itself. But what I principally pause at present to say is — that, for the sake of perspicuity, I think it necessary, in reference to this word, to make the following distinction. The term *conception*, like *perception*, *imagination*, etc., means two things, or rather the same thing in two different relations, — relations, however, which it is of great importance to distinguish, and to mark the distinction by the employment of distinct words. *Conception* means both the act of conceiving, and the object conceived; as *perception*, both the act of perceiving, and the thing perceived; *imagination*, both the act of imagining, and what is imagined. Now, this is a source of great vagueness in our philosophical discussions: have we no means of avoiding this inconvenience? I think we have; and that, too, without committing any violence upon language. I would propose the following distinction: For the act of conceiving, the term *conception* should be employed, and that exclusively; while for the object of conception, or that which is conceived, the term *concept* should be used.[2] Concept is the English of the Latin *conceptum*, — *id quod conceptum est*, — and had it no vested right as an actual denizen of the language, it has good warrant for its naturalization. There are a thousand words in English formed on precisely the same analogy, as *precept*, *digest*, etc., etc. But we have no occasion to appeal to analogy. The term *concept* was in common use among the older philosophical writers in English,[3] though, like many other valuable expressions of these authors, it has been overlooked by our

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[1] See *Lectures on Metaphysics*, lect. xxxiii p. 472. — Ed.

[2] See Biel, [*In Sent.*, l. l dist. 2, qu. 8; l. ii dist. 2, qu. 2. By Occam and most others, *conceptus* is used as "id quod terminat actum intelligendi." See Occam, *In Sent.*, l. i. d. 2, qu. 8, and Biel, l. i. d. 3, q. 5.]

[3] See Zachary Coke, *Art of Logick*. London 1654, pp. 11, 101, *et alibi*; Gideon Harvey, *Archelogia Philosophica Nova, or New Principles*

English lexicographers. I may add, that nearly the same fortune has befallen the term in French. *Concept* was in ordinary use by the old French philosophers, but had latterly waxed obsolete. It has, however, I see, been reïnstated in its rights since the reäwakening of philosophy in France; and, in particular, it is now employed in that language in translating from the German the term *Begriff*. I shall, therefore, make no scruple in using the expression *concept* for the object of conception, and *conception* I shall exclusively employ to designate the act of conceiving. Whether it might not, in like manner, be proper to introduce the term *percept* for the object of perception, I shall not at present inquire.

Analogy between Logic and Mathematics.

But to return from this digression. Logic, we have seen, is exclusively conversant about thought strictly so denominated, and thought proper, we have seen, is the cognition of one object of thought by another, in or under which it is mentally included; — in other words, thought is the knowledge of a thing through a concept or general notion, or of one notion through another. In thought, all that we think about is considered either as something containing, or as something contained; — in other words, every process of thought is only a cognition of the necessary relations of our concepts. This being the case, it need not move our wonder that Logic, within its proper sphere, is of such irrefragable certainty, that, in the midst of all the revolutions of philosophical doctrines, it has stood not only unshattered but unshaken. In this respect, Logic and Mathematics stand alone among the sciences, and their peculiar certainty flows from the same source. Both are conversant about the relations of certain *a priori* forms of intelligence: — Mathematics about the necessary forms of Imagination; Logic about the necessary forms of Understanding; Mathematics about the relations of our representations of objects, as out of each other in space and time; Logic about the relations of our concepts of objects, as in or under each other, that is, as, in different relations, respectively containing and contained. Both are thus demonstrative or absolutely certain sciences only as each develops what is given — what is given as necessary, in the mind itself. The laws of Logic are grounded on the mere possibility of a knowledge through the concepts of the Understanding, and through these we know only by comprehending the many under the one. Concerning the nature of the objects delivered by the Subsidiary Faculties

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*of Philosophy.* Lond 1663, P. i., b. ii., c. 4, p. 22. For several authorities for the use of this term among the older English logicians, see Baynes, *New Analytic of Logical Forms*, pp. 5-6. note. — Ed.

to the Elaborative, Logic pronounces nothing, but restricts its consideration to the laws according to which their agreement or disagreement is affirmed.[1]

Logic is the negative condition of truth.

It is of itself manifest that every science must obey the laws of Logic. If it does not, such pretended science is not founded on reflection, and is only an irrational absurdity. All inference, evolution, concatenation, is conducted on logical principles — principles which are ever valid, ever imperative, ever the same. But an extension of any science through Logic is absolutely impossible; for by conforming to logical canons we acquire no knowledge — receive nothing new, but are only enabled to render what is already obtained more intelligible, by analysis and arrangement. Logic is only the negative condition of truth.[2] To attempt by a mere logical knowledge to amplify a science, is an absurdity as great as if we should attempt by a knowledge of the grammatical laws of a language to discover what was written in this language, without a perusal of the several writings themselves. But though Logic cannot extend, cannot amplify a science by the discovery of new facts, it is not to be supposed that it does not contribute to the progress of science. The progress of the sciences consists not merely in the accumulation of new matter, but likewise in the detection of the relations subsisting among the materials accumulated; and the reflective abstraction by which this is effected, must not only follow the laws of Logic, but is most powerfully cultivated by the habits of logical study. In these intercalary observations I have, however, insensibly encroached upon the second question, —What is the Utility of Logic? On this question I now dictate the following paragraph:

Par. IV. Utility of Logic.

> ¶ IV. As the rules of Logic do not regard the matter but only the form of thought, the Utility of Logic must, in like manner, be viewed as limited to its influence on our manner of thinking, and not sought for in any effect it can exert upon what we think about. It is, therefore, in the first place, not to be considered useful as a Material Instrument, that is, as a mean of extending our knowledge by the discovery of new truths; but merely as a Formal Instrument, that is, as a mean by which knowledge, already acquired, may be methodized into the form accommodated to the conditions of our understanding. In the second place, it is not to be regarded as a Medicine of the mind

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[1] Cf. Bachmann, *Logik*, Einleitung, § 20. Edit. 1828. — ED.

[2] [Ancillon, *Essais Philosophiques*, t. ii p 291.]

to the extent of remedying the various errors which originate in the nature of the objects of our knowledge, but merely to the extent of purging the mind of those errors which arise from inconsequence and confusion in thinking.[1]

Logic, however, is still of eminent utility, not only as presenting to us the most interesting object of contemplation in the mechanism of human thought, but as teaching how, in many relations, to discriminate truth from error, and how to methodize our knowledge into system; while, at the same time, in turning the mind upon itself, it affords to our higher faculties one of their most invigorating exercises. Another utility is, that Logic alone affords us the means requisite to accomplish a rational criticism, and to communicate its results.

What is now summarily stated in the preceding paragraph, I illustrated, in my last Lecture, in detail, — in so far as it was requisite to disencumber the real value of our science from those false utilities which, in place of enhancing its worth in the opinion of the world, have, in fact, mainly contributed to reduce the common estimate of its importance far beneath the truth. I now proceed to terminate what I have to say under this head by a few words, in exposition of what renders the cultivation of Logic — of genuine logic — one of the most important and profitable of our studies.

Logic gives us, to a certain extent, dominion over our thoughts.

"Admitting, therefore, that this science teaches nothing new, — that it neither extends the boundaries of knowledge, nor unfolds the mysteries which lie beyond the compass of the reflective intellect, — and that it only investigates the immutable laws to which the mind in thinking is subjected, still, inasmuch as it develops the application of these laws, it bestows on us, to a certain extent, a dominion over our thoughts themselves. And is it nothing to watch the secret workshop in which nature fabricates cognitions and thoughts, and to penetrate into the sanctuary of self-consciousness, to the end that, having learnt to know ourselves, we may be qualified rightly to understand all else? Is it nothing to seize the helm of thought, and to be able to turn it at our will? For, through a research into the laws of thinking, Logic gives us, in a certain sort, a possession of the thoughts themselves. It is true, indeed, that the mind of man is, like the universe of matter, governed by eternal laws, and follows, even without consciousness, the invariable canons of its nature. But to know and understand itself, and out of the boundless chaos of phænomena presented to the senses to form concepts, through concepts to reduce that chaos to harmony and arrangement, and thus to establish the dominion of intelligence over the universe of existence, — it is this alone which constitutes man's grand and distinctive preëminence."[1] "Man," says the great Pascal, "is but a reed, — the very frailest in nature; but he is a reed that thinks. It needs not that the whole universe should arm to crush him. He dies from an exhalation, from a drop of water. But should the universe conspire to crush him, man would still be nobler than that by which he falls; for he knows that he dies; and of the victory which the universe has over him, the universe knows nothing. Thus our whole dignity consists in thought. . . . . Let us labor, then, to think aright; this is the foundation of morality."[2]

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[1] Cf. Krug, *Logik*, § 9. — Ed.

Supplies in part the criterion of truth from error.

In the world of sense, illusive appearances hover around us like evil spirits; unreal dreams mingle themselves with real knowledge; the accustomed assumes the character of certainty; and the associations of thought are mistaken for the connections of existence. We thus require a criterion to discriminate truth from error; and this criterion is, in part at least, supplied to us by Logic. Logic teaches us to analyze the concrete masses of our knowledge into its elements, and thus gives us a clear and distinct apprehension of its parts, it teaches us to think consistently and with method, and it teaches us how to build up our accumulated knowledge into a firm and harmonious edifice.[3] "The study of logic is as necessary for correct thinking, as the study of grammar is for correct speaking; were it not otherwise and in itself an interesting study to investigate the mechanism of the human intellect in the marvellous processes of thought. They, at least, who are familiar with this mechanism, are less exposed to the covert fallacies which so easily delude those unaccustomed to an analysis of these processes."[4]

Invigorates the Understanding

But it is not only by affording knowledge and skill that Logic is thus useful; it is perhaps equally conducive to the same end by bestowing power. The retorsion of thought upon itself — the thinking of thought — is a vigorous effort, and, consequently, an invigorating exercise of the Understanding; and as the understanding is the instrument of all scientific, of all philosophical, speculation, Logic, by preeminently cultivating the understanding, in this respect likewise vindicates its ancient title to be viewed as the best preparatory discipline for Philosophy and the sciences at large.

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[1] [Heinrich Richter], [*Über den Gegenstand und den Umfang der Logik*, pp. 3, 4, Leipsic, 1825. — Ed.]

[2] *Pensees*, P. i. art. iv. § 6. (vol. ii. p. 84. ed. Faugère.) Compare *Discussions*, p. 311 — Ed.

[3] Cf. Richter, *Logik*, pp. 5, 6, 12. — Ed

[4] Krug, *Logik*, § 9, p. 26. — Ed.

There is, however, one utility which, though of a subordinate kind, I must not omit, though I do not remember to have seen it insisted on by any logical writer. In reference to this, I give you the following paragraph:

Par. V. Utility of Logic, — as affording a scientific nomenclature.

¶ V. But Logic is further useful as affording a Nomenclature of the laws by which legitimate thinking is governed, and of the violation of these laws, through which thought becomes vicious or null.

Illustration.

It is said, in Hudibras,[1]—

> "That all a Rhetorician's rules
> Serve only but to name his tools;"

and it may be safely confessed that this is one of the principal utilities of Rhetoric. A mere knowledge of the rules of Rhetoric can no more enable us to compose well, than a mere knowledge of the rules of Logic can enable us to think well. There is required from nature, in both, the faculty; but this faculty must, in both departments, be cultivated by an assiduous and also a well-directed exercise; that is, in the one, the powers of Comparison must be exercised according to the rules of a sound Rhetoric, in the other, according to the rules of a sound Logic. In so far, therefore, the utility of either science is something more than a mere naming of their tools. But the naming of their tools, though in itself of little value, is valuable as the condition of an important function, which, without this, could not be performed. Words do not give thoughts; but without words, thoughts could not be fixed, limited, and expressed. They are, therefore, in general, the essential condition of all thinking, worthy of the name. Now, what is true of human thought in general, is true of Logic and Rhetoric in particular. The nomenclature in these sciences is the nomenclature of certain general analyses and distinctions, which express to the initiated, in a single word, what the uninitiated could (supposing — what is not probable — that he could perform the relative processes) neither understand nor express without a tedious and vague periphrasis; while, in his hands, it would assume only the appearance of a particular observation, instead of a particular instance of a general and acknowledged rule. To take a very simple example: there is in Logic a certain sophism,

Importance of a scientific nomenclature.

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[1] P. Cant i. 89 — Ed

Example.

or act of illegal interference, by which two things are, perhaps in a very concealed and circuitous manner, made to prove each other. Now, the man unacquainted with Logic may perhaps detect and be convinced of the fallacy; but how will he expose it? He must enter upon a long statement and explanation, and after much labor to himself and others, he probably does not make his objection clear and demonstrative after all. But between those acquainted with Logic, the whole matter would be settled in two words. It would be enough to say and show that the inference in question involved a *circulus in concludendo*, and the refutation is at once understood and admitted. It is in like manner that one lawyer will express to another the *ratio decidendi* of a case in a single technical expression; while their clients will only perplex themselves and others in their attempts to set forth the merits of their cause. Now, if Logic did nothing more than establish a certain number of decided and decisive rules in reasoning, and afford us brief and precise expressions by which to bring particular cases under these general rules, it would confer on all who in any way employ their intellect — that is, on the cultivators of every human science — the most important obligation. For it is only in the possession of such established rules, and of such a technical nomenclature, that we can accomplish, with facility, and to an adequate extent, a criticism of any work of reasoning. Logical language is thus, to the general reasoner, what the notation of Arithmetic, and still more of Algebra, is to the mathematician. Both enable us to comprehend and express, in a few significant symbols, what would otherwise overpower us by their complexity; and thus it is that nothing would contribute more to facilitate and extend the faculty of reasoning, than a general acquaintance with the rules and language of Logic, — an advantage extending indeed to every department of knowledge, but more especially of importance to those professions which are occupied in inference, and conversant with abstract matter, such as Theology and Law.

III. Divisions of Logic.

I now proceed to the third of the preliminary questions — viz., How is Logic divided? Now, it is manifest that this question may be viewed in two relations; for, in asking how is Logic divided, we either mean how many kinds are there of Logic, or into how many constituent parts is it distributed?[1] We may consider Logic either as a universal, or as an integrate, whole.

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[1] Division of Logic into Natural and Artificial, inept.

"He hits each point with native force of mind,
Whilst puzzled Logic struggles far behind."

Cf. Krug, *Logik*, p. 29. Troxler *Logik*, i. 48.

I. The Species of Logic.

It is necessary to consider the former question first; for, before proceeding to show what are the parts of which a logic is made up, it is requisite previously to determine what the logic is of which these parts are the components. Under the former head, I therefore give you the following:

Par. VI. Logic, by relation to the mind, is Objective and Subjective.

¶ VI. Logic, considered as a Genus or Class, may, in different relations, be divided into different Species. And, in the first place, considered by relation to the mind or thinking subject, Logic is divided into Objective and Subjective, or, in the language of some older authors, into *Logica systematica* and *Logica habitualis*.[1]

Explication.

By Objective or Systematic Logic is meant that complement of doctrines of which the science of Logic is made up; by Subjective or Habitual Logic is meant the speculative knowledge of these doctrines which any individual, (as Socrates, Plato, Aristotle) may possess, and the practical dexterity with which he is able to apply them.

Both these Logics ought to be proposed as the end of logical instruction.

Now, it is evident that both these Logics, or, rather, Logic considered in this twofold relation, ought to be proposed to himself by an academical instructor. We must, therefore, neglect neither. Logic considered as a system of rules, is only valuable as a mean towards logic considered as a habit of the mind; and, therefore, a logical instructor ought not to think that he fulfils his duty — that he accomplishes all that he is called on to perform — if he limit himself to the mere enouncement of a code of doctrine, leaving his pupils to turn his instructions to their own account as best they may. On the contrary, he is bound to recollect that he should be something more than a book; that he ought not only himself to deliver the one Logic, but to take care that his pupils acquire the other. The former, indeed, he must do as a condition of the latter; but if he considers the systematic logic which he pronounces, as of any value, except in so far as his pupils convert it into an habitual logic, he understands nothing of the character of the function which he attempts to perform. It is, therefore, incumbent on an academical instructor, to do what in him lies to induce his pupils, by logical exercise, to digest what is presented to them as an objective system into a subjective habit. Logic, therefore, in both these relations belongs to us, and neither can be neglected without compromising the utility of a course like the present.

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[1] See Timpler, p. 877; Vossius, p. 217; Pacius. [*Logicæ Systema, authore M. Clemente Timplero*, Hanoviæ, 1612. Vossius, *De Natura Artium*, l. iv. *Sive de Logica*, c. ix. Pacius, *In Porphyrii Isagogen*, p. 2, ed. Francof, 1697. On various divisions of Logic, see Timpler, *Logicæ Systema*, l. i. c. 1, q. 13—20, p. 40—56, Gisbert ab Isendoorn, *Effata Philosophica*, [Cent. i. § 51—63, p. 95 *et seq.*, ed. Daventriæ 1643. — ED.]

Par. VII. Logic, by relation to objects, is Abstract or General, and Concrete or Special.

¶ VII. In the second place, by relation to its application or non-application to objects, Logic is divided into Abstract or General, and into Concrete or Special. The former of these is called, by the Greek Aristotelians, διαλεκτικὴ χωρὶς πραγμάτων, and, by the Arabian and Latin schoolmen, *Logica docens;* while the latter is denominated, by the Greeks, διαλεκτικὴ ἐν χρήσει καὶ γυμνασίᾳ πραγμάτων; by the Arabians and Latins, *Logica utens.*

Explication.

Abstract Logic considers the laws of thought as potentially applicable to the objects of all arts and sciences, but as not actually applied to those of any; Concrete Logic considers these laws in their actual and immediate application to the object-matter of this or that particular science. The former of these is one, and alone belongs to philosophy, whereas the latter is as multiform as the arts and sciences to which it is relative.[1]

This division of Logic remounts to Alexander the Aphrodisian.

This division of Logic does not remount to Aristotle, but it is found in his most ancient commentator, Alexander the Aphrodisian, and, after him, in most of the other Greek Logicians. Alexander illustrates the opposition of the logic divorced from things (χωρὶς πραγμάτων, — *rebus avulsa*), to the logic applied to things (ἐν χρήσει καὶ γυμνασίᾳ πραγμάτων, — *rebus applicata*), by a simile. "The former, he says, "may be resembled to a geometrical figure, say a triangle, when considered abstractly and in itself; whereas the latter may be resembled to the same triangle, as concretely existing in this or that particular matter: for a triangle considered in itself is ever one and the same; but viewed in relation to its matter, it varies according to the variety of that matter; for it is different as it is of silver, gold, lead — as it is of wood, of stone, etc.[2] The same holds good of Logic. General or Abstract Logic is always one and the same; but as applied to this or to that object of consideration, it appears multiform." So far Alexander. This appearance of multiformity I may, however, add, is not real; for the mind has truly only one mode of thinking, one mode of reasoning, one mode of conducting itself in the investigation of truth, whatever may be the object on which it exercises itself. Logic may therefore be again well compared to the authority of an universal empire — of an empire governing the world by common laws. In such a dominion there are many provinces, various regions, and different præfectures. There is one præfect in Asia, another in Europe, a third in Africa, and each is decorated by different titles; but each governs and is governed by the common laws of the empire confided to his administration. The nature of General Logic may likewise be illustrated by another comparison. The Thames, for instance in passing London, is a single river, — is one water, — but is there applied to many and different uses. It is employed for drinking, for cooking, for brewing, for washing, for irrigation, for navigation, etc. In like manner, Logic in itself is one: as a science or an art, it is single; but, in its applications, it is of various and multiform use in the various branches of knowledge, conversant be it with necessary, or be it with contingent matter. Or further, to take the example of a cognate science, if any one were to lay down different grammars of a tongue, as that may be applied to the different purposes of life, he would be justly derided by all grammarians, indeed by all men; for who is there so ignorant as not to know that there is but one grammar of the same language in all its various applications?[1]

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[1] See Krug, p. 27 [*Logik*, § 10, Anm. — Ed.]

[2] [Isendoorn, *Effata*, Cent. i. 55; Crellius, *Isagoge Logica*, p. 12.] The illustration is fully given by Balforeus, *Commentarius in Organum*, p. 23. q. v. § 2. "Alexander Aphrodisiensis Logicam illam abjunctam similem esse ait figuræ geometricæ, utpote triangulo, dum in se et per se spectatur; Logicam vero

Illustrated by comparisons.

Thus, likewise, there is only one method of reasoning, which all the sciences indifferently employ; and although men are severally occupied in different pursuits, and although one is, therefore, entitled a Theologian, another a Jurist, a third a Physician, and so on, each

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cum rebus conjunctam similem eidem triangulo huic aut illi materiæ impresso. Nam trianguli in se una est et eadem ratio; at pro varietate materiæ varia. Aliud enim est argenteum, aliud aureum, aliud ligneum, lapideum, aut plumbeum." The passage referred to is probably one in the Commentary on the *Prior Analytics*, p. 2, ed. Ald. The distinction itself, though not the illustration, is given more exactly in the language of the text by some of the later commentators. See the Introductions of Ammonius to the *Categories*, and of Philoponus to the *Prior Analytics*. — Ed.]

[1] See Rami *Sch.*, p. 350, [*P. Rami Scholæ in Liberales Artes*, Basileæ, 1578. "Unus est Lutetiæ Sequana, ad multos tamen usus et varios accommodatus, lavandum, aquandum, vehendum, irrigandum, coquendum: sic una est Logica, varii et multiplicis usus, in propositione necessaria, probabili, captiosa; ars tamen una. Si Grammaticas tres aliquis ineptus nobis instituat, unam civilem, alteram agrestem, tertiam de vitis amborum, merito rideatur a Grammaticis omnibus, qui unam Grammaticam norunt omnium ejusdem linguæ hominum communem." — Ed.]

employs the same processes, and is governed by the same laws, of thought. Logic itself is, therefore, widely different from the use — the application of Logic. For Logic is astricted to no determinate matter, but is extended to all that is the object of reason and intelligence. The use of Logic, on the contrary, although potentially applicable to every matter, is always actually manifested by special reference to some one. In point of fact, Logic, in its particular applications, no longer remains logic, but becomes part and parcel of the art or science in which it is applied. Thus Logic, applied to the objects of geometry, is nothing else than Geometry; Logic, applied to the objects of physics, nothing else than Natural Philosophy. We have, indeed, certain treatises of Logic in reference to different sciences, which may be viewed as something more than these sciences themselves. For example: we have treatises on Legal Logic, etc; but such treatises are only introductions — only methodologies of the art or science to which they relate. For such special logics only exhibit the mode in which a determinate matter or object of science, the knowledge of which is presupposed, must be treated, the conditions which regulate the certainty of inferences in that matter, and the methods by which our knowledge of it may be constructed into a scientific whole. Special Logic is thus not a single discipline, not the science of the universal laws of thought, but a congeries of disciplines, as numerous as there are special sciences in which it may be applied. Abstract or General Logic, on the contrary, in virtue of its universal character, can only and alone be one; and can exclusively pretend to the dignity of an independent science. This, therefore, likewise exclusively concerns us.

General Logic is alone one; Special Logic is manifold, and part of the science in which it is applied.

# LECTURE IV.

## INTRODUCTION.

### LOGIC — III. ITS DIVISIONS — PURE AND MODIFIED.

Recapitulation.

In my last Lecture, after terminating the consideration of the second introductory question, touching the Utilities of Logic, I proceeded to the third introductory question, — What are the Divisions of Logic? and stated to you the two most general classifications of this science. Of these, the first is the division of Logic into Objective and Subjective, or Systematic and Habitual; the second is its division into General and Special, or Abstract and Concrete.

To speak only of the latter, Abstract or General Logic is logic viewed as treating of the formal laws of thought, without respect to any particular matter. Concrete or Special Logic is logic viewed as treating of these laws in relation to a certain matter, and in subordination to the end of some determinate science. The former of these is one, and belongs alone to philosophy, that is, to the science of the universal principles of knowledge; the latter is as manifold as the sciences to which it is subservient, and of which it, in fact, constitutes a part, — viz., their Methodology. This division of logic is given, but in different terms, by the Greek Aristotelians and by the Latin schoolmen. The Greek division does not remount to Aristotle, but it is found in his earliest expositor, Alexander of Aphrodisias, and he was probably not the first by whom it was enounced. It is into διαλεκτικὴ χωρὶς πραγμάτων, *Logica rebus avulsa*, that is, Logic merely formal, Logic apart from things; in other words, abstract from all particular matter; and διαλεκτικὴ ἐν χρήσει καὶ γυμνασίᾳ πραγμάτων, *Logica rebus applicata*, that is, Logic as used and exercised upon things; in other words, as applied to certain special objects.

This distinction of Logic by the Greek Aristotelians seems altogether unknown to modern logicians. The division of Logic by the scholastic Aristotelians is the same with the preceding, but the terms in which it is expressed are less precise and unambiguous.

This division is into the *Logica docens* and *Logica utens.* The *Logica docens* is explained as logic considered as an abstract theory, — as a preceptive system of rules, — "que tradit præcepta;" — the *Logica utens*, as logic considered as a concrete practice, — as an application of these rules to use, — "quæ utitur præceptis."[1]

The division of Logica docens, and Logica utens, mistaken by some modern authors.

This scholastic division of Logic into *docens* and *utens* has, I see, been noticed by some of the more modern authors; but it has been altogether mistaken, which it would not have been, had these authors been aware of the meaning in which the terms were employed, and had they not been ignorant of the more explicit expression of it by the Greeks. Thus the terms *docens* and *utens* are employed by Wolf to mark a distinction not the same as that which they designate in the scholastic logic, and as the Wolfian distinction will not stand the test of criticism, the terms themselves have been repudiated by those who were not aware that there was an older and a more valid division which they alone properly expressed.[2] Wolf makes the *Logica docens*, the mere knowledge of the rules: the *Logica utens*, the habit or dexterity of applying them. This distinction of General and Special logic, Wolf and the Wolfian logicians, likewise, denote by that of Theoretical and Practical Logic.[3] These terms are in themselves by no means a bad expression of the distinction; but those by whom they were employed, unfortunately did not limit their Practical Logic to what I have defined as Special, for under Practical they included not only Special, but likewise Modified Logic, of which we are now to speak.

Having explained, then, this primary division of Logic into General and Special, and stated that General Logic, as alone a branch of philosophy, is alone the object of our consideration; I proceed to give the division of General Logic into two great species, or rather parts, — viz., into Pure or Abstract, and Modified or Concrete.

**Par. VIII. General Logic, divided into Pure and Modified.**

¶ VIII. In the third place, considered by reference to the circumstances under which it can come into exercise by us, Logic — Logic General or Abstract — is divided into Pure and Modified; — a division, however, which is perhaps rather the distribution of a science into its parts than of a genus into its species. Pure Logic considers the laws of thought proper, as contained *a priori* in the nature of pure intelligence itself. Modified Logic, again, exhibits these laws as modified in their actual applications by certain general circumstances external and internal, contingent in themselves, but by which human thought is always more or less influenced in its manifestations.[1]

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[1] *Smiglecii Logica*, Disp. ii. q. vi. For scholastic authorities, see Aquinas, *In IV. Metaph.*, lect. iv. Scotus, *Super Univ. Porphyrii*, q. i — Ed.

[2] [As Krug] [see his *Logik*, § 11, p. 30. Compare Kant, *Logik*, Einleitung, ii. — Ed.]

[3] Wolf, *Philosophia Rationalis*, §§ 8, 9, 10, 12. — Ed. [Cf. Stattler, Sauter, and Mako.] [Stattler, *Logica*, § 18, p. 12; Sauter, *Positiones Logicæ*, P. I. and II. 1778; *Instit. Log.*, P. I. and II. 1799; Paulus Mako de Kerek-Gede, *Comp. Log. Instit.* P. I. and II., 4th edit., 1773. — Ed.]

Pure Logic.

Modified Logic.

Nomenclature of Modified Logic.

The term Applied Logic.

Pure Logic considers Thought Proper simply and in itself, and apart from the various circumstances by which it may be affected in its actual application. Human thought, it is evident, is not exerted except by men and individual men. By men, thought is not exerted out of connection with the other constituents of their intellectual and moral character, and, in each individual, this character is variously modified by various contingent conditions of different original genius, and of different circumstances contributing to develop different faculties and habits. Now, there may be conceived a science, which considers thought not merely as determined by its necessary and universal laws, but as contingently affected by the empirical conditions under which thought is actually exerted; — which shows what these conditions are, how they impede, and, in general, modify, the act of thinking; and how, in fine, their influence may be counteracted. This science is, Modified or Concrete Logic. What I have called Modified Logic is identical with what Kant and other philosophers have denominated Applied Logic. (*Angewandte Logik*, *Logica applicata.*)[2] This expression I think improper. For the term *Applied Logic* can only with propriety be used to denote Special or Concrete Logic; and is, in fact, a brief and excellent translation of the terms by which Special Logic was designated by the Greeks, as that ἐν χρήσει καὶ γυμνασίᾳ πραγμάτων. And so, in fact, by the Latin Logicians was the Greek expression rendered. Let us consider the meaning of the term *applied*. Logic, as applied, must be applied to something, and that something can only be an object or matter. Now, Special Logic is necessarily an applied logic; therefore the term *applied*, if given to what I would call Modified Logic, would not distinguish Modified from Special Logic. But further, the term *applied* as given to Modified Logic, considered in itself, is wrong; for in Modified Logic thought is no more considered as actually applied to any particular matter than in Pure Logic. Modified Logic only considers the necessary in conjunction with the contingent conditions under which thought is actually exertible; but it does not consider it as applied to one class of objects more than to another; that is, it does not consider it as actually applied to any, but as potentially applicable to all. In every point of view, therefore, the term *applied*, as given to Modified Logic, is improper; whereas, if used at all, it ought to be used as a synonym for *special;* which I would positively have done, were it not that, having been unfortunately bestowed by high authority on what I have called Modified Logic, the employment of it to designate a totally different distinction might generate confusion. I have therefore refrained from making use of the term. I find, indeed, that all logicians who, before Kant, ever employed the expression *Applied Logic*, employed it as convertible with Special or Concrete Logic.[1] In fine, it is to be observed that the terms *pure* and *applied*, as usually employed in opposition in the Kantian philosophy, and in that of Germany in general, are not properly relative and correlative to each other. For *pure* has its proper correlative in *modified* or *mixed; applied* its proper relative in *unapplied*, that is, *divorced from things*, that is, *abstract.*

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[1] For distinction of reason *in abstracto* and reason *in concreto*, grounding the distinction of an Abstract (or Pure), and a Concrete (or Modified) Logic, see Boyle's *Works*, iv. p. 164 See also Lambert [*Neues Organon*, *Dianoiologie*, i — ED ], § 444, who says that the sciences in general are only applied logics. Cf. Ploucquet, p 236, [*Sammlung der Schriften welche den Logischen Calcul Herrn Prof. Ploucquets betreffen*, Tübingen, 1773. — ED.]

[2] Kant, *Logik*, Einleitung ii.; Hoffbauer. *Anfangsgründe der Logik*, §§ 17. 406; Krug *Logik*. Einleitung, § 11; Fries, *System der Logik*, § 2. — ED.

How properly employed.

Modified Logic not properly an essential part of Logic.

But passing from words to things, I may observe that it can be questioned whether Modified or Concrete Logic be entitled to the dignity of an essential part of Logic in general, far less of a coördinate species as opposed to Pure or Abstract Logic. You are aware, from what I have previously stated under the first introductory question, that Logic, as conversant about a certain class of mental phænomena, is only a part of the general philosophy of mind; but that, as exclusively conversant about what is necessary in the phænomena of thought, that is, the laws of thinking, it is contradistinguished from Empirical Psychology, or that philosophy of mind which is merely observant and inductive of the mental phænomena as facts. But if Modified or Concrete Logic be considered either as a part or as a species of General Logic, this discrimination of Logic, as the Nomology of thought, from Psychology, as the Phænomenology of mind, will not hold. For Modified Logic, presupposing a knowledge of the general and the contingent phænomena of mind, will thus either comprise Psychology within its sphere, or be itself comprised within the sphere of Psychology. But whichever alternative may be preferred, the two sciences are no longer distinct. It is on this ground that I hold, that, in reality, Modified Logic is neither an essential part nor an independent species of General Logic, but that it is a mere mixture of Logic and Psychology, and may, therefore, be called either Logical Psychology or Psychological Logic.[1] There is thus in truth only one Logic, that is, Pure or Abstract Logic. But while this, I think, must be admitted in speculative rigor, still, as all sciences are only organized for human ends, and as a general consideration of the modifying circumstances which affect the abstract laws of thought in their actual manifestations, is of great practical utility, I trust that I shall not be regarded as deforming the simplicity of the science, if I follow the example of most modern logicians, and add (be it under protest) to Pure or Abstract Logic a part, or an appendix, under the name of Modified Logic. In distributing the science, therefore, into these two principal heads, you will always, I request, keep steadily in mind, that, in strict propriety, Pure Logic is the only science of Logic — Modified Logic being only a scientific accident, ambiguously belonging either to Logic or to Psychology.

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[1] See Balforeus, [*R. Balforei Commentarius in Organum*, q. v. § 2. p. 22. "Graeci . . . aliam dicunt Logicam abjunctam et a rebus separatam; aliam rebus applicatam et cum iis conjunctam." — Ed.]

Conspectus of the Course of Logic

This being understood, I now proceed to state to you the distribution of the general science into its parts; and as it is of high importance that you now obtain a comprehensive view of the relation of these parts to each other and to the whole which they constitute, in order that you may clearly understand the point towards which we travel, and every stage in our progress, — I shall comprise this whole statement in the following paragraph, which I shall endeavor to make sufficiently intelligible without much subsequent illustration. That illustration, however, I will give in my next Lecture. As this paragraph is intended to afford you a conspectus of the ensuing Course, in so far as it will be occupied with Logic, I need hardly say that you will find it somewhat long. It is, however, I believe, the only paragraph of any extent which I shall hereafter be obliged to dictate.

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[1] [See Richter, p 67, [*Über den Gegenstand und den Umfang der Logik*, § 17, Leipsic, 1825.— Ed.]

**Par. IX Distribution of Logic into its parts.**

¶ IX. GENERAL OR ABSTRACT LOGIC, we have seen, is divided into two parts, — into PURE and into MODIFIED. Of these in their order.

I. — PURE LOGIC may, I think, best be distributed upon the following principles. We may think; and we may think well. On the one hand, the conditions of thinking do not involve the conditions of thinking well; but the conditions of thinking well involve the conditions of thinking. Logic, therefore, as the science of thought, must necessarily consider the conditions of the possibility of thought. On the other hand, the end of thought is not merely to think, but to think well; therefore, as the end of a science must be conformed to the end of its object-matter, Logic, as the science of thought, must display not only the laws of possible, but the laws of perfect, thinking. Logic, therefore, naturally falls into two parts, the one of which investigates the formal conditions of mere thinking; the other, the formal conditions of thinking well.

i. — In regard to the former: — The conditions of mere thinking are given in certain elementary requisites; and that part of Logic which analyzes and considers these, may be called its Stoicheiology, or Doctrine of Elements. These elements are either Laws or Products.

ii. — In regard to the latter, as perfect thinking is an end, and as, the elementary means being supposed, the conditions of an end are the ways or methods by which it may be accomplished, that part of Logic which analyzes and considers the methods of perfect thinking, may be called its Methodology, or Doctrine of Method.

Thus PURE LOGIC is divided into two parts, — into Stoicheiology, or the Doctrine of Elements, and Methodology, or the Doctrine of Method. Of these in their order.

Logical Stoicheiology, or the doctrine conversant about the elementary requisites of mere thought, I shall divide into two parts. The first of these treats of the Fundamental Laws of thinking; in other words, of the universal conditions of the thinkable — Noetic — Nomology. The second treats of the laws of thinking, as governing the special functions, faculties, or products of thought, in its three gradations of Conception; or, as it is otherwise called, Simple Apprehension, — Judgment, and Reasoning, — Dianoetic — Dynamic.

This second part of Stoicheiology will, therefore, fall into three subordinate divisions corresponding to these several degrees of Conception, Judgment, and Reasoning. So much for the Doctrine of Elements.

Logical Methodology, or the doctrine conversant about the regulated ways or methods in which the means of thinking are conducted to their end of thinking well, is divided into as many parts as there are methods, and there are as many methods as there are different qualities in the end to be differently accomplished. Now the perfection of thought consists of three virtues, — Clear Thinking, Distinct Thinking, and Connected Thinking; each of these virtues is accomplished by a distinct method; and the three methods will consequently afford the division of Logical Methodology into three parts.

The first part comprises the method of Clear Thinking, or the doctrine of Illustration or Definition.

The second part comprises the Method of Distinct Thinking, or the doctrine of Division.

The third part comprises the Method of Concatenated or Connected Thinking, or the Doctrine of Proof.

These parts are only, however, three particular applications of Method; they, therefore, constitute each only a Special Methodology. But such methodology, or union of methodologies, supposes a previous consideration of method in general, in its notion, its species, and its conditions. Logical Methodology will therefore consist of two parts, of a General and of a Special, — the Special being subdivided, as above stated. So much for the distribution of PURE LOGIC.

II. — MODIFIED LOGIC falls naturally into Three Parts.

The First Part treats of the nature of Truth and Error, and of the highest laws for their discrimination, — Alethiology.

The Second treats of the Impediments to thinking, with the Means of their Removal. These impediments arise, 1°, from the Mind; 2°, From the Body; or, 3°, From External Circumstances. In relation to the Mind, these impediments originate in the Senses, in Self-Consciousness, in Memory, in Association, in Imagination, in Reason, in the faculty of Language, in the Feelings, in the Desires, in the Will. In relation to the Body, they originate in Temperament, or in the state of Health. In relation to External Circumstances, they originate in the diversities of Education, of Rank, of Age, of Climate, of Social Intercourse, etc.

The Third Part treats of the Aids or Subsidiaries of thinking; and thinking is aided either, 1°, Through the Acquisition, or, 2°, Through the Communication, of Knowledge.

The former of these subsidiaries (the acquisition of knowledge) consists, 1°, Of Experience (and that either by ourselves or by others); 2°, Of Generalization (and this through Induction and Analogy); and, 3°, Of Testimony (and this either Oral or Written). Under this last head falls to be considered the Credibility of Witnesses, the Authenticity and Integrity of Writings, the Rules of Criticism and of Interpretation.

The latter of these subsidiaries, the Communication of Knowledge, is either One-sided or Reciprocal. The former consists of Instruction, either Oral or Written; the latter of Conversation, Conference, Disputation.

So much for the distribution of MODIFIED LOGIC.

Tabular view of the Divisions of Logic.

On the opposite page is a general tabular view of the Divisions of Logic now given.

IV. The History of Logic.

This question postponed.

The fourth and fifth questions of the Introduction would now fall to be considered, — viz., What is the History and what is the Bibliography, of Logic? Were I writing a book, and not giving a course of Lectures upon Logic, I would certainly consider these questions in the introduction to the science; but I would do this with the admonition that beginners should pass these over, and make themselves first of all familiar with the doctrines of which the science is itself the complement. For why? The history of a science is a narrative of the order in which its several parts have been developed, and of the contributions which have been made to it by different cultivators; but such a narrative necessarily supposes a previous knowledge of the contents of the science, — a knowledge which is identical with a knowledge of the science itself. It is, therefore, evident, that a history of Logic can only be proposed with advantage to those who are already in some degree familiar with Logic itself: and as, in a course like the present, I am bound to presume that you are not as yet conversant with the science, it follows that such a history cannot with any propriety be attempted in the commencement, but only towards the conclusion, of the Lectures.

V. The Bibliography of Logic.

In regard to the fifth question, — What is the Bibliography or Literature of Logic? — the same is true, in so far as a knowledge of the books written upon a science is correlative to a knowledge of its history. At the same time, nothing could be more unprofitable than

# A TABULAR VIEW

### OF THE

# DIVISIONS OF LOGIC.

General or Abstract Logic.

- I. Pure.
  - i. Stoicheiology.
    - 1. Noetic, — Nomology.
    - 2. Diaonetic Dynamic.
      - *a.* Conception.
      - *b.* Judgment.
      - *c.* Reasoning.
  - ii. Methodology.
    - Clear Thinking.— Definition or Illustration.
    - Distinct Thinking. — 2. Division.
    - Connected Thinking. — 3. Probation or Proving.
- II. Modified.
  - i. Truth and Error — Certainty and Illusion.
  - ii. Impediments to Thinking, with Remedies. These Impediments arise from . . .
    - 1. The Mind.
    - 2. The Body.
    - 3. External Circumstances.
  - iii. Aids or Subsidiaries to Thinking — through
    - 1. The Acquisition of Knowledge.
    - 2. The Communication of Knowledge, etc.

for me to recite to you a long series of works to which you have not access, by authors of whom you probably never heard, often in languages which few of you understand. In the present stage of your studies, it is not requisite that you should know of many books, but that you should read attentively a few; — *non multa sed multum.* — I shall therefore adjourn, at least, the consideration of the question, What in general are the principal books on the science of Logic? — simply recommending to you a few, not absolutely the best, but such as you can most easily procure; such as are in languages which most of you can read, and which are of such a character as may be studied with most general advantage.

General notice of works on Logic.

Of works in our own language, as those most accessible and most intelligible to all, there are unfortunately hardly any which I can recommend to you as exhibiting the doctrines of Logic, either in purity or completeness. The *Logic* of Watts, of Duncan, and others, are worth reading, as books, but not as books upon Logic. The *Elements of Logic* by Dr. Whately is, upon the whole, the one best entitled to your attention, though it is erroneous in various respects, and imperfect in more. The abridgment of this work by Hinds contains what of the original is most worthy of study, in the commencement of a logical education. In French, there are sundry works deserving of your attention (Damiron,[1] Delarivière);[2] but the only one which I would at present earnestly recommend to your study, is the celebrated Port Royal Art of Thinking, — *L'Art de Penser*, — an anonymous work, but the authors of which were the two distinguished Jansenists, Arnauld and Nicole. It has been frequently reprinted; and there is recently a stereotyped edition, by Hachette, of Paris, which can easily be procured. There are more than one translation of the work into Latin, and at least two English versions, both bad.[3]

In Latin there is a very elegant compend of Logic by the late illustrious Daniel Wyttenbach, of Leyden. Besides the Dutch editions, which are handsome, there is a cheap reprint published by Professor Maas, of Halle, who has, however, ventured on the unwarrantable liberty of silently altering the text, besides omitting what he did not consider as absolutely indispensable for a text-book. This work can be easily procured. There is also in Latin a system of

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[1] *Cours de Philosophie*, t. iv.; *Logique*, Paris, 1837. — Ed.

[2] *Logique Classique*, Paris, 1829. — Ed.

[3] A third and far superior translation has subsequently appeared by Mr. Baynes, Edinburgh, 1850; 2d edition, 1851. In the Introduction to this version will be found an account of the various editions and translations of the work. — Ed.

Logic by Genovesi, under the title, *Genuensis Ars Logico-critica.* This work is, however, extremely rare even in Italy, and it was many years before I was able to procure a copy. There was an edition of this work published in Germany in 1760, at Augsburg, but the impression seems to have been small, for it also is out of print. The Italian Logic of Genovesi has, however, been repeatedly reprinted, and this, with the valuable addition of Romagnosi, is easily obtained. Of the older writers on Logic in Latin, the one I would principally recommend to you is Burgersdyk — Burgersdicius. His *Institutiones Logicæ* is not a rare work, though, as there are no recent editions, it is not always without trouble to be obtained.

# LECTURE V.

## PURE LOGIC.

## PART I.—STOICHEIOLOGY.

### SECTION I. NOETIC.—ON THE FUNDAMENTAL LAWS OF THOUGHT—THEIR CONTENTS AND HISTORY.

Stoicheiology.

Having terminated our consideration of the various questions of which the Introduction to Logic is composed, we proceed to the doctrines which make up the science itself, and commence the First Great Division of Pure Logic—that which treats of its elementary or constituent processes,—Stoicheiology. But Stoicheiology was again divided into two parts,—into a part which considered the Fundamental Laws of Thought in general, and into a part which considered these laws as applied to and regulating the special function of Thought in its various gradations of Conception, Judgment, and Reasoning. The title, therefore, of the part of Logic on which we are about to enter is,—*Pure Logic, Part I. Stoicheiology—Section I. Noetic. On the Fundamental Laws of Thought.*

The character of Thought in general.

Before, however, descending to the consideration of these laws, it is necessary to make one or two preliminary statements touching the character of that thought of which they are the necessary conditions; and, on this point, I give, in the first place, the following paragraph:

Par. X.

> ¶ X. Logic considers Thought, not as the operation of thinking, but as its product; it does not treat of Conception, Judgment, and Reasoning, but of Concepts, Judgments, and Reasonings.

Thought as the object of Logic

I have already endeavored to give you a general knowledge of what is meant by *thought.* You are aware that this term is, in relation to Logic, employed in its strictest and most limited signification,—viz., as the act or product of the Discursive Faculty, or Faculty of

Relations; but it is now proper to consider, somewhat more closely, the determinate nature of this process, and the special point of view in which it is regarded by the logician.

The subject, form, and matter of thought.

In an act of thinking, there are three things which we can discriminate in consciousness, — 1°, There is the thinking subject, that is, the mind or ego, which exerts or manifests the thought; 2°, There is the object about which we think, which is called the *matter* of thought; and, 3°, There is a relation between subject and object of which we are conscious, — a relation always manifested in some determinate mode or manner; — this is the *form* of thought.

Thought as the object respectively of Psychology and of Logic.

Now, of these three, Logic does not consider either the first or the second. It takes no account, at least no direct account, of the real subject, or of the real object, of thought, but is limited exclusively to the form of thought. This has been already stated. But, again, this form of thought is considered by Logic only in a certain aspect. The form of thought may be viewed on two sides or in two relations. It holds, as has been said, a relation both to its subject and to its object, and it may accordingly be viewed either in the one of these relations or in the other. In so far as the form of thought is considered in reference to the thinking mind, — to the mind by which it is exerted, — it is considered as an act, or operation, or energy; and in this relation it belongs to Phænomenal Psychology. Whereas, in so far as this form is considered in reference to what thought is about, it is considered as the product of such an act, and, in this relation, it belongs to Logic. Thus Phænomenal Psychology treats of thought proper as conception, judgment, reasoning; Logic, or the Nomology of the understanding, treats of thought proper as a concept, as a judgment, as a reasoning. Whately, I have already shown you, among other errors in his determination of the object-matter of Logic, confounds or reverses this; for he proposes to Logic, not thought considered as a product, but reasoning alone; and that, too, considered as a producing operation. He thus confounds Logic with Phænomenal Psychology.

Be it, therefore, observed, that Logic, in treating of the formal laws of thought, treats of these in reference to thought considered as a product; that is, as a concept, a judgment, a reasoning; whereas Psychology, as the Phænomenology of mind, considers thought as the producing act, that is, as conception, judgment, reasoning. (You here see, by the way, the utility of distinguishing *concept* and *conception*. It is unfortunate that we cannot also distinguish more precisely judgment and reasoning as producing acts, from a judgment and a reasoning as products.)

**Par. XI. Thought a mediate and complex cognition.**

¶ XI. Thought, as the knowledge of one thing in relation to another, is a mediate and complex cognition.

Explication.

The distinctive peculiarity of thinking in general is, that it involves the cognition of one thing by the cognition of another. All thinking is, therefore, a mediate cognition; and is thus distinguished from our knowledge in perception, external and internal, and in imagination; in both of which acts we are immediately cognitive of the object, external or internal, presented in the one, and of the object, external or internal represented in the other. In the Presentative and Representative Faculties, our knowledge is of something considered directly and in itself; in thought, on the contrary, we know one object only through the knowledge of another. Thus in perception, of either kind, and in imagination, the object known is always a single determinate object; whereas in thought, — in thought proper, — as one object is only known through another, there must always be a plurality of objects in every single thought. Let us take an example of this, in regard to the simplest act of thought. When I see an individual, — say Bucephalus or Highflyer, — or when I represent him in imagination, I have a direct and immediate apprehension of a certain object in and through itself, without reference to aught else. But when I pronounce the term *Horse*, I am unable either to perceive in nature, or to represent in imagination, any one determinate object corresponding to the word. I obtain the notion corresponding to this word, only as the result of a comparison of many perceptions or imaginations of Bucephalus, Highflyer, Dobbin, and other individual horses; it, therefore, contains many representations under it, has reference to many objects, out of relation to which it cannot possibly be realized in thought; and it is in consequence of this necessity of representing (potentially at least) a plurality of individual objects under the notion *horse*, that it obtains the denomination *concept*, that is, something taken up or apprehended in connection with something else. This, however, requires a further explication. When we perform an act of thought, of positive thought, this is done by thinking something, and we can think anything only by thinking it as existing; while, again, we cannot think a thing to exist except in certain determinate modes of existence. On the other hand, when we perform an act of negative thought, this is done by thinking something as not existing in this or that determinate mode, and when we think it as existing in no determinate mode, we cease to think it at all; it becomes a nothing, a logical nonentity (*non-ens Logicum*).

It being thus understood that thought can only be realized by thinking something; it being further understood that this something, as it is thought, must be thought as existing; and it being still further understood that we can think a thing as existing only by thinking it as existing in this, that, and the other determinate manner of existence, and that whenever we cease to think something, something existing, something existing in a determinate manner of existence, we cease to think at all;—this, I say, being understood, it is here proper to make you, once for all, acquainted with the various terms by which logicians designate the modes or manners of cogitable existence. I shall therefore comprise these in the following paragraph:

**Par. XII. The various terms by which the modes of cogitable existence are designated.**

¶ XII. When we think a thing, this is done by conceiving it as possessed of certain modes of being, or qualities, and the sum of these qualities constitutes its *concept* or *notion* (νόημα, ἔννοια, ἐπίνοια, *conceptum*, *conceptus*, *notio*). As these qualities or modes (ποιότητες, *qualitates*, *modi*) are only identified with the thing by a mental attribution, they are called *attributes* (κατηγορούμενα, *attributa*); as it is only in or through them that we say or enounce aught of a thing, they are called *predicates*, *predicables*, and *predicaments*, or *categories*, these words being here used in their more extensive signification (λεγόμενα χερί, κατηγορίαι, κατηγορήματα κατηγορούμενα, *prædicata*, *prædicabilia*, *prædicamenta*); as it is only in and through them that we recognize a thing for what it is, they are called *notes*, *signs*, *marks*, *characters* (*notæ*, *signa*, *characteres*, *discrimina*); finally, as it is only in and through them that we become aware that a thing is possessed of a peculiar and determinate existence, they are called *properties*, *differences*, *determinations* (*proprietates*, *determinationes*). As consequent on, or resulting from, the existence of a thing, they have likewise obtained the name of *consequents* (ἑπόμενα, *consequentia*, etc.). What in reality has no qualities, has no existence in thought,—it is a logical nonentity; hence, *e converso*, the scholastic aphorism,—*non-entis nulla sunt prædicata.* What, again, has no qualities attributed to it, though attributable, is said to be *indetermined* (ἀδιόριστον, *indeterminatum*); it is only a possible object of thought.[1]

Explication. What is involved in thinking an object.

This paragraph, which I have dictated that you might be made once for all acquainted with the relative terms in use among logicians, requires but little explanation. I may state, however, that the mind only thinks an object by separating it from others; that is, by marking it out or characterizing it; and in so far as it does this, it encloses it within certain fixed limits, that is, determines it. But if this discriminative act be expressed in words, I predicate the marks, notes, characters, or determinations of the thing; and if, again, these be comprehended in one total thought, they constitute its concept or notion. If, for example, I think of Socrates as son of *Sophroniscus*, as *Athenian*, as *philosopher*, as *pug-nosed*, these are only so many characters, limitations, or determinations, which I predicate of Socrates, which distinguish him from all other men, and together make up my notion or concept of him.

The attribution involved in thought is regulated by laws.

But as thought, in all its gradations of conception, judgment, and reasoning, is only realized by the attribution of certain qualities or characters to the objects of, or about which we think; so this attribution is regulated by laws, which render a great part of this process absolutely necessary. But when I speak of laws and of their absolute necessity in relation to thought, you must not suppose that these laws and that necessity are the same in the world of mind as in the world of matter. For free intelligences, a law is an ideal necessity given in the form of a precept, which we ought to follow, but which we may also violate if we please; whereas, for the existences which constitute the universe of nature, a law is only another name for those causes which operate blindly and universally in producing certain inevitable results. By *law of thought*, or by *logical necessity*, we do not, therefore, mean a physical law, such as the law of gravitation, but a general precept which we are able certainly to violate, but which if we do not obey, our whole process of thinking is suicidal, or absolutely null. These laws are, consequently, the primary conditions of the possibility of valid thought, and as the whole of Pure Logic is only an articulate development of the various modes in which they are applied, their consideration in general constitutes the first chapter in an orderly

What is meant by a law as applicable to free intelligence.

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[1] [Schulze, *Logik*, § 13. Rösling, p. 63.] [*Die Lehren der reinen Logik*, Ulm, 1826. Cf. Krug, *Logik*, § 16. — ED.]

system of the science. Now, in explaining to you this subject, the method I shall pursue is the following: I shall, first of all, state in general the number and significance of the laws as commonly received; I shall then more particularly consider each of these by itself and in relation to the others; then detail to you their history; and, finally, state to you my own views in regard to their deduction, number, and arrangement.

Order of consideration of the fundamental laws of thought.

¶ XIII. The Fundamental Laws of Thought, or the conditions of the thinkable, as commonly received, are four: — 1. The Law of Identity; 2. The Law of Contradiction; 3. The Law of Exclusion or of Excluded Middle; and, 4. The Law of Reason and Consequent, or of Sufficient Reason.

Par. XIII. Fundamental Laws of Thought.

Of these in their order.

¶ XIV. The principle of Identity (*principium Identitatis*) expresses the relation of total sameness in which a concept stands to all, and the relation of partial sameness in which it stands to each, of its constituent characters. In other words, it declares the impossibility of thinking the concept and its characters as reciprocally unlike. It is expressed in the formula *A is A*, or *A=A;* and by *A* is denoted every logical thing, every product of our thinking faculty, — concept, judgment, reasoning, etc.[1]

Par. XIV. Law of Identity.

The principle of Identity is an application of the principle of the absolute equivalence of a whole and of all its parts taken together, to the thinking of a thing by the attribution of constituent qualities or characters. The concept of the thing is a whole, the characters are the parts of that whole.[2] This law may, therefore, be also thus enounced, — Everything is equal to itself, — for in a logical relation the thing and its concept coincide; as, in Logic, we abstract altogether from the reality of the thing which the concept represents. It is, therefore, the same whether we say that the concept is equal to all its characters, or that the thing is equal to itself.[3]

Explication.

The law has, likewise, been expressed by the formula — In the predicate, the whole is contained explicitly, which in the subject is contained implicitly. It is also involved in the axiom — *Nota notæ est nota rei ipsius.*[1]

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[1] [Schulze, *Logik*, § 17. Gerlach, *Logik*, § 37.] Cf. Krug, *Logik*, § 17. — Ed.

[2] See Schulze, *Logik*. p. 32-3. — Ed.

[3] See Krug, *Logik*, p. 40. — Ed.

The logical importance of the law of identity lies in this — that it is the principle of all logical affirmation and definition. An example or two may be given to illustrate this.

Its logical importance — The principle of all logical affirmation and definition.

1. In a concept, which we may call Z, the characters $a$, $b$, and $c$, are thought as its constituents; consequently, the concept, as a unity, is equal to the characters taken together — $Z = (a + b + c)$. If the former be affirmed, so also is the latter; therefore, Z being $(a + b + c)$ is $a$, is $b$, is $c$. To take a concrete example: The concept *man* is a complement made up of the characters, 1°, *substance,* 2°, *material,* 3°, *organized,* 4°, *animated,* 5°, *rational,* 6°, *of this earth;* in other words *man* is *substance,* is *material,* is *organized,* is *animated,* is *rational. Being,* as entering into every attribution, may be discharged as affording no distinction.

This illustrated.

2. Again, suppose that, in the example given, the character $a$ is made up of the characters $l$, $m$, $n$, it follows, by the same law of Identity, that $Z = a = (l, m, n)$ is $l$, is $m$, is $n$. The concept *man* contains in it the character *animal,* and the character *animal* contains in it the characters *corporeal, organized, living,* etc.

The second law is the principle of Contradiction or Non-contradiction, in relation to which I shall dictate the following paragraph:

> ¶ XV. When an object is determined by the affirmation of a certain character, this object cannot be thought to be the same when such character is denied of it. The impossibility of this is enounced in what is called the principle of Contradiction (*principium Contradictionis seu Repugnantiæ*). Assertions concerning a thing are mutually contradictory, when the one asserts that the thing possesses the character which the other asserts that it does not. This law is logically expressed in the formula — What is contradictory is unthinkable. $A = not\ A = 0$, *or* $A - A = 0$.

Par. XV. Law of Contradiction.

Now, in the first place, in regard to the name of this law, it may be observed that, as it enjoins the absence of contradiction as the indispensable condition of

Its proper name.

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[1] See Kant, *Logik*, p. 40. — Ed.

thought, it ought to be called, not the Law of Contradiction, but the Law of Non-contradiction, or of *non-repugnantia*.[1]

How enounced.

This law has frequently been enounced in the formula — It is impossible that the same thing can at once be and not be; but this is exposed to sundry objections. It is vague, and therefore useless. It does not indicate whether a real or a notional existence is meant; and if it mean the former, then is it not a logical but a metaphysical axiom. But even as a metaphysical axiom it is imperfect; for to the expression *at once* (*simul*) must be added, *in the same place*, *in the same respect*, etc.[2]

This law has likewise been expressed by the formula — Contradictory attributes cannot be united in one act of consciousness. But this is also obnoxious to objection. For a judgment expresses as good a unity of consciousness as a concept. But when I judge that *round* and *square* are contradictory attributes, there are found in this judgment contradictory attributes, but yet a unity of consciousness. The formula is, therefore, vaguely and inaccurately expressed.

The principle of all logical negation and distinction.

The logical import of this law lies in its being the principle of all logical negation and distinction.

The law of Identity and the law of Contradiction are coördinate and reciprocally relative, and neither can be educed as second from the other as first; for in every such attempt at derivation, the supposed secondary law is, in fact, always necessarily presupposed.[3] These are, in fact, one and the same law, differing only by a positive and negative expression.

In relation to the third law, take the following paragraph:

Par. XVI. Law of Excluded Middle.

> ¶ XVI. The principle of Excluded Third or Middle — viz., between two contradictories (*principium Exclusi Medii vel Tertii*), enounces that condition of thought which compels us, of two repugnant notions, which cannot both coëxist, to think either the one or the other as existing. Hence arises the general axiom — Of contradictory attributions, we can only affirm one of a thing; and if one be explicitly affirmed, the other is implicitly denied. *A either is or is not.* *A either is or is not B.*[4]

By the laws of Identity and Contradiction, I am warranted to conclude from the truth of one contradictory proposition to the falsehood of the other, and by the law of Excluded Middle, I am warranted to conclude from the falsehood of one contradictory proposition to the truth of the other. And in this lies the peculiar force and import of this last principle. For the logical significance of the law of Excluded Middle consists in this, that it limits or shuts in the sphere of the thinkable in relation to affirmation; for it determines, that, of the two forms given in the laws of Identity and Contradiction, and by these laws affirmed as those exclusively possible, the one or the other must be affirmed as necessary.

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[1] Compare Krug, *Logik*, § 18. — Ed.

[2] Compare the criticism of Kant, *Kritik d. r. V.*, p. 134, ed. Rosenkranz. — Ed.

[3] This is shown more in detail by Hoffbauer *Anfangsgründe der Logik*, § 23. — Ed.

[4] See Schulze, *Logik*, § 19. — Ed.

Logical significance of this law.

The law of Excluded Middle is the principle of Disjunctive Judgments, that is, of judgments in which a plurality of judgments are contained, and which stand in such a reciprocal relation that the affirmation of one is the denial of the other.

The principle of Disjunctive Judgments.

I now go on to the fourth law.

¶ XVII. The thinking of an object, as actually characterized by positive or by negative attributes, is not left to the caprice of Understanding — the faculty of thought; but that faculty must be necessitated to this or that determinate act of thinking by a knowledge of something different from, and independent of, the process of thinking itself. This condition of our understanding is expressed by the law, as it is called, of Sufficient Reason (*principium Rationis Sufficientis*); but it is more properly denominated the law of Reason and Consequent (*principium Rationis et Consecutionis*). That knowledge by which the mind is necessitated to affirm or posit something else, is called the *logical reason, ground*, or *antecedent;* that something else which the mind is necessitated to affirm or posit, is called the *logical consequent;* and the relation between the reason and consequent, is called the *logical connection* or *consequence.* This law is expressed in the formula — Infer nothing without a ground or reason.[1]

Par. XVII. Law of Sufficient Reason, or of Reason and Consequent.

The relations between Reason and Consequent, when comprehended in a pure thought, are the following:

Relations between Reason and Consequent.

1. When a reason is explicitly or implicitly given, then there must

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[1] See Schulze, *Logik*, § 19, and Krug, *Logik*, § 20. — Ed

exist a consequent; and, *vice versa*, when a consequent is given, there must also exist a reason.

2. Where there is no reason there can be no consequent; and, *vice versa*, where there is no consequent (either implicitly or explicitly) there can be no reason. That is, the concepts of reason and of consequent, as reciprocally relative, involve and suppose each other.

Logical significance of this law.

The logical significance of the law of Reason and Consequent lies in this,— That in virtue of it, thought is constituted into a series of acts all indissolubly connected; each necessarily inferring the other. Thus it is that the distinction and opposition of possible, actual and necessary matter, which has been introduced into Logic, is a doctrine wholly extraneous to this science.

Reason and Consequent, and Cause and Effect.

I may observe that "Reason is something different from Cause, and Consequent something different from Effect; though cause and effect, in so far as they are conceived in thought, stand to each other in the relation of reason and consequent. Cause is thus thought of as a real object, which affords the reason of the existence of another real object, the effect; and effect is thought of as a real object, which is the consequent of another real object, the cause. Accordingly, every cause is recognized in thought as a reason, and every effect is recognized in thought as a consequent; but the converse is not true, that every reason is really considered a cause, and every consequent really considered an effect. We must, therefore, carefully distinguish mere reason and mere consequent, that is, ideal or logical reason and consequent, from the reason which is a cause and the consequent which is an effect, that is, real or metaphysical reason and consequent.

Logical and Metaphysical Reason and Consequent.

"The expression *logical reason and consequent* refers to the mere synthesis of thoughts; whereas the expression *metaphysical reason and consequent* denotes the real connection of existences. Hence the axiom of Causality, as a metaphysical principle, is essentially different from the axiom of Reason and Consequent, as a logical principle. Both, however, are frequently confounded with each other; and the law of Reason and Consequent, indeed, formerly found its place in the systems of Metaphysic, while it was not, at least explicitly, considered in those of Logic.

Generality of the terms Condition and Conditioned.

The two terms *condition* and *conditioned* happily express at once the relations both of reason and consequent, and of cause and effect. A condition is a thing which determines (negatively at least) the existence of another; the conditioned is a thing whose existence is determined in and by another. If used in an ideal or logical signification, *condition* and *conditioned* import only the reason in conjunction with its consequent; if used in a real or metaphysical sense, they express the cause in connection with its effect."[1]

History of the development of the fundamental Laws of Thought.

I have now, in the prosecution of our inquiry into the fundamental laws of logical thinking, to say a few words in regard to their History, — their history being the narration of the order in which, and of the philosophers by whom, they were articulately developed.

The law of Identity last developed in the order of time.

Of the first three laws, which, from their intimate cognition, may not unreasonably be regarded as only the three sides or phases of a single law, the law of Identity, which stands first in the order of nature, was indeed that last developed in the order of time; the axioms of Contradiction and of Excluded Middle having been long enounced, ere that of Identity had been discriminated and raised to the rank of a coördinate principle. I shall not, therefore, now follow the order in which I detailed to you these laws, but the order in which they were chronologically generalized.

The principles of Contradiction and Excluded Middle can be traced back to Plato.

The principles of Contradiction and of Excluded Middle can both be traced back to Plato, by whom they were enounced and frequently applied; though it was not till long after, that either of them obtained a distinctive appellation. To take the principle of Contradiction first. This law Plato frequently employs, but the most remarkable passages are found in the *Phædo*, in the *Sophista*, and in the fourth and seventh books of the *Republic*.[2]

Law of Contradiction emphatically enounced by Aristotle.

This law was, however, more distinctively and emphatically enounced by Aristotle. In one place,[3] he says: "It is manifest that no one can conceive to himself that the same thing can at once be and not be, for thus he would hold repugnant opinions, and subvert the reality of truth. Wherefore, all who attempt to demonstrate, reduce everything to this as the ultimate doctrine; for this is by nature the principle of all other axioms." And in several passages of his *Metaphysics*,[1] in his *Prior Analytics*,[2] and in his *Posterior Analytics*,[3] he observes that "some had attempted to demonstrate this principle, — an attempt which betrayed an ignorance of those things whereof we ought to require a demonstration, and of those things whereof we ought not: for it is impossible to demonstrate everything; as in this case, we must regress and regress to infinity, and all demonstration would, on that supposition, be impossible."

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[1] Krug, *Logik*, pp. 62, 63 This exposition of the law of Reason and Consequent does not represent the Author's latest view. In a note to the *Discussions*, p 160 (where a similar doctrine had been maintained in the article as originally published), he says: "The logical relation of *Reason* and *Consequent*, as *more* than a mere corollary of the law of *Noncontradiction* in its three phases, is, I am confident of proving, erroneous." And again, in the same work, p 603: "The principle of *Sufficient Reason* should be excluded from Logic. For, in as much as this principle is not material, it is only a derivation of the three formal laws; and in as much as it is material, it coincides with the principle of Causality, and is extra-logical." The Laws of Thought, properly so called, are thus reduced to three, —those of *Identity*, *Contradiction*, and *Excluded Middle*. — Ed.

[2] See *Phædo*, p. 103; *Sophista*, p. 252; *Republic*, iv. p. 436; vii. p. 525. — Ed.

[3] *Metaph.*, l. iii. (iv.) c. 3.

With the Peripatetics the highest principle of knowledge. Obtained its name from the Greek Aristotelians.

The Schoolmen, — Suarez.

Following Aristotle, the Peripatetics established this law as the highest principle of knowledge. From the Greek Aristotelians it obtained the name by which it has subsequently been denominated, the *principle*, or *law*, or *axiom*, *of contradiction*, (ἀξίωμα τῆς ἀντιφάσεως). This name, at least, is found in the Commentaries of Ammonius and Philoponus, where it is said to be "the criterion which divides truth from falsehood throughout the universe of existence."[4] The schoolmen, in general, taught the same doctrine; and Suarez even says, that the law of contradiction holds the same supremacy among the principles of existence.[5]

Controversies respecting the truth and character of this law.

After the decline of the Aristotelian philosophy, many controversies arose touching the truth, and still more touching the primitive or axiomatic character, of this law. Some maintained that it was indemonstrable; others that it could be proved, but proved only indirectly by a *reductio ad absurdum;* while others, again, held that this could be directly done, and that, consequently, the law of Contradiction was not entitled to the dignity of a first principle.[6]

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[1] L. iii. c. 4.

[2] L. ii. c. 2.

[3] L. i. c. 2.

[4] For the name, see Ammonius, *In De Interpret.*, Comment., p. 153 b, ed. Ald. Venet. 1546. Philoponus, *In Anal. Pr.*, p. 13 b, 38 b, ed. Venet 1536. *In Anal Post.*, p 30 b, ed. Ald. Venet. 1534. The language quoted in the text is nearly a translation of Ammonius *In Categ.*, p. 140 a. Ἡ μὲν γὰρ κατάφασις καὶ ἀπόφασις ἀεὶ ἐπὶ πάντων τῶν ὄντων καὶ μὴ ὄντων διαιρεῖ τὸ ἀγηθὲς καὶ τὸ ψεῦδος. Ammonius is followed by Philoponus, who says, — Τὸ δὲ τῆς ἀντιφάσεως ἀξίωμα ἐπὶ πάντων μὲν τῶν ὄντων καὶ μὴ ὄντων διαιρεῖ τὸ ψεῦδος καὶ τὴν ἀληθεῖαν. *In Anal. Post.*, l, i. c. xi. f. 30 b. — Ed. [Cf. Augustinus Niphus Suessanus, *In Anal. Post.*, p. 88, ed Paris, 1540.]

[5] See [Alstedius, *Artium Liberalium Systema* (8vo), p. 174. "Cognitio a priori est principiorum; inter quæ agmen ducit hoc, *impossibile est idem esse et non esse.* . . . Consule *Metaph*, Suarezii: — 'Hoc, inquam, tenet primatum inter principia cognoscendi, sicut Deus inter principia essendi.' "]

[6] Cf. Suarez, *Disputationes Metaphysicæ*, Disp. iii. § 3 — Ed. [Alstedius, *Encyclopædia*, l. iii., *Archelogia*, c. vii. p. 80.]

Locke.
Leibnitz.

Its truth denied by modern absolutists.

In like manner, its employment was made a further matter of controversy. Finally, it was disputed whether it were an immediate, native, or *a priori* datum of intelligence; or whether it were an *a posteriori* and adventitious generalization from experience. The latter alternative, that it was only an induction, was maintained by Locke.[1] This opinion was, however, validly refuted by Leibnitz, who showed that it is admitted the moment the terms of its enunciation are understood, and that we implicitly follow it even when we are not explicitly conscious of its dictate.[2] Leibnitz, in some parts of his works, seems to identify the principles of Identity and Contradiction; in others, he distinguishes them, but educes the law of Identity out of the law of Contradiction.[3] It is needless to pursue the subsequent history of this principle, which in latter times has found none to gainsay the necessity and universality of its truth, except among those philosophers who, in Germany, have dreamt that man is competent to a cognition of the absolute: and as a cognition of the absolute can only be established through positions repugnant, and, therefore, on logical principles, mutually exclusive, they have found it necessary to start with a denial of the fundamental laws of thought; and so, in their effort to soar to a philosophy above logic and intelligence, they have subverted the conditions of human philosophy altogether. Thus Schelling and Hegel prudently repudiated the principles of Contradiction and Excluded Middle as having any application to the absolute;[4] while again those philosophers (as Cousin) who attempt a cognition of the absolute without a preliminary repudiation of the laws of Logic, at once involve themselves in contradictions, the cogency of which they do not deny, and from which they are wholly unable to extricate themselves.[5]

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[1] *Essay*, B. i. ch. ii. § 4. — Ed.

[2] *Nouveaux Essais*, B. i. ch. i. § 4. — Ed.

[3] Compare *Théodicée*, § 44, *Monadologie*, § 31, with *Nouveaux Essais*, l. i. ch. i. § 10; l. iv. ch. ii. § 1. — Ed.

[4] See Schelling, *Vom Ich als Princip der Philosophie*, § 10; Hegel, *Logik*, b. ii. c. 2; *Encyklopadie*, § 115, 119. Schelling endeavors to abrogate the principle of Contradiction in relation to the higher philosophy, by assuming that of Identity; the empirical antagonism between *ego* and *non-ego* being merged in the identity of the absolute *ego*. Hegel regards both principles alike as valid only for the finite Understanding, and as inapplicable to the higher processes of the Reason. This difference between the two philosophers is pointed out by the latter in his *Geschichte der Philosophie*, (*Werke*, xv. p. 598.) — Ed. [On rejection of the Logical Laws, by Schelling, Hegel, etc., see Bachmann, *Über die Philosophie meiner Zeit*, p. 218, ed. Jena, 1816. Bolzano, *Wissenschaftslehre*, iv., *Logik*, § 718. Sigwart, *Logik*, § 58, p. 42, ed. 1835. Herbart, *De Principio Logico Exclusi Medii inter Contradictoria non negligendo*, Götting, 1833. Hartenstein, *De Methodo Philosophiæ Logicæ Legibus adstringenda, finibus non terminanda*, Lipsiæ, 1835. On the logical and metaphysical significance of the principle of Contradiction, see Platner, *Phil. Aph.*, I. § 673, and Kant, *Kritik d. reinen Vernunft*, p. 191, ed. 1790.]

[5] See the Author's criticism of Cousin, *Discussions*, p. 1 *et seq.* — Ed.

But this by the way, and on a subject which at present you cannot all be supposed to understand.

Law of Excluded Middle.

Explicitly enounced by Aristotle.

Cicero.

Baumgarten.

The law of Excluded Middle between two contradictories remounts, as I have said, also to Plato, though the *Second Alcibiades*, the dialogue in which it is most clearly expressed, must be admitted to be spurious.[1] It is also in the fragments of Pseudo-Archytas, to be found in Stobæus.[2] It is explicitly and emphatically enounced by Aristotle in many passages both of his *Metaphysics* (l. iii. (iv.) c. 7.) and of his *Analytics*, both *Prior* (l. i. c. 2) and *Posterior* (l. i. c. 4). In the first of these, he says: "It is impossible that there should exist any medium between contradictory opposites, but it is necessary either to affirm or to deny everything of everything." And his expressions are similar in the other books. Cicero says "that the foundation of Dialectic is, that whatever is enounced is either true or false." This is from his *Academics* (l. ii. c. xxix.), and there are parallel passages in his *Topics* (c. xiv.) and his *De Oratore* (l. ii. c. xxx.). This law, though universally recognized as a principle in the Greek Peripatetic school, and in the schools of the middle ages, only received the distinctive appellation by which it is now known at a comparatively modern date.[3] I do not recollect having met with the term *principium exclusi medii* in any author older than the Leibnitzian Baumgarten,[4] though Wolf[5] speaks of the *exclusio medii inter contradictoria*.

Law of Identity.
Antonius Andreas.

The law of Identity, I stated, was not explicated as a coördinate principle till a comparatively recent period. The earliest author in whom I have found this done, is Antonius Andreas, a scholar of Scotus, who flourished at the end of the thirteenth and beginning of the fourteenth century. The schoolman, in the fourth book of his Commentary of Aristotle's *Metaphysics*,[6] — a commentary which is full of the most ingenious and original views, — not only asserts to the law of Identity a coördinate dignity with the law of Contradiction, but, against Aristotle, he maintains that the principle of Identity, and not the principle of Contradiction, is the one absolutely first. The formula in which Andreas expressed it was *Ens est ens*. Subsequently to this author, the question concerning the relative priority of the two laws of Identity and of Contradiction became one much agitated in the schools; though there were also found some who asserted to the law of Excluded Middle this supreme rank.[1]

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[1] *Second Alcibiades*, p. 139. See also *Sophista*, p. 250 — ED.

[2] *Eclogæ*. l. ii. c. 2, p. 158, ed. Antwerp, 1575; Part ii. tom. 1. p. 22, ed. Heeren Cf. Simplicius, *In Arist. Categ.*, pp. 97, 103, ed. Basil, 1551. — ED.

[3] *Lex contradictoriarum*, *principium contradicentium* (sc. *propositionum*), as used in the schools, included the law of Contradiction and the law of Excluded Middle. See Molinæus *Elementa Logica*, l. ii. c. 14, [p. 172, ed. 1603 "Contradicentium usus explicatur uno axiomate: — Contradicentia non possunt de eodem simul esse vera; et necessarium est contradicentium alterum cuilibet rei convenire, alterum non convenire" — ED ]

[4] *Metaphysica*, § 10. — ED.

[5] *Ontologia*, §§ 52, 53.

[6] Quæstio v. p. 21 a, ed. Venet., 1513. — ED

Leibnitz.

Wolf.

Baumgarten.

Leibnitz, as I have said, did not always distinguish the principles of Identity and of Contradiction. By Wolf the former was styled the principle of Certainty, (*principium Certitudinis*);[2] but he, no more than Leibnitz himself, sufficiently discriminated between it and the law of Contradiction. This was, however, done by Baumgarten, another distinguished follower of Leibnitz,[3] and from him it received the name of the principle of Position, that is, of Affirmation or Identity, (*principium Positionis sive Identitatis*), — the name by which it is now universally known. This principle has found greater favor, in the eyes of the absolutist philosophers, than those of Contradiction and Excluded Middle. By Fichte and Schelling it has been placed as the primary principle of all philosophy.[4] Hegel alone subjects it, along with the other laws of thought, to a rigid but fallacious criticism; and rejects it along with them, as belonging to that lower sphere of knowledge, which is conversant only with the relative and finite.[5]

Fichte and Schelling.

Hegel.

Law of Reason and Consequent.

Recognized by Plato and Aristotle.

Ἀρχὴ τῆς γνώσεως.

Ἀρχὴ τῆς γένεσεως.

The fourth law, that of Reason and Consequent, which stands apart by itself from the other three, was, like the laws of Contradiction and Excluded Middle, recognized by Plato.[6] He lays it down as a postulate of reason, to admit nothing without a cause; and the same is frequently done by his scholar Aristotle.[7] Both, however, in reference to this principle, employ the ambiguous term *cause* (αἰτία αἴτιον). Aristotle, indeed, distinguishes the law of Reason, as the ideal principle of knowledge (ἀρχὴ τῆς γνώσεως, *principium cognoscendi*), from the real principle of Production, (ἀρχὴ τῆς γενέσεως, *principium fiendi*, — *principium essendi*).[1] By Cicero, the axiom of reason and consequent was, in like manner, comprehended under the formula, *nihil sine causa*,[2] — a formula adopted by the schoolmen; although they, after Aristotle, distinguished under it the *ratio essendi*, and the *ratio cognoscendi*.

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[1] [Alex. de Ales, *In Arist. Metaph.*, iv. 1. 9.] Compare Suarez, *Disp. Metaph.*, Disp. iii. § 3. Alexander professes to agree with Aristotle in giving the first place to the principle of Contradiction, but, in fact, he identifies it with that of Excluded Middle, *de quovis affirmatio vel negatio* — ED.

[2] *Ontologia*, § 55, 288. — ED.

[3] *Metaphysica*, § 11. — ED.

[4] See Fichte, *Grundlage der gesammten Wissenschaftslehre*, § 1. Schelling, *Vom Ich*, § 7. — ED.

[5] See above, p. 64, note 4. — ED.

[6] *Philebus*, p. 26. — ED.

[7] E. g. *Anal. Post.*, ii. 16; *Phys.*, ii. 3; *Metaph.*, i. 1, 3; *Rhet.*, ii. 23. — ED.

Cicero.
The Schoolmen.

Leibnitz called attention to Law of Sufficient Reason.

In modern times, the attention of philosophers was called to this law of Leibnitz, who, on the two principles of Reason and of Contradiction, founded the whole edifice of his philosophy.[3] Under the latter law, as I have mentioned, he comprehended, however, the principle of Identity; and in the former he did not sufficiently discriminate, in terms, the law of Causality, as a real principle, from the law of Reason, properly so called, as a formal or ideal principle. To this axiom he gave various denominations, — now calling it the principle of Determining Reason, now the principle of Sufficient Reason, and now the principle of Convenience or Agreement (*convenientia*); making it, in its real relation, the ground of all existence; in its ideal, the ground of all positive knowledge. On this subject there was a celebrated controversy between Leibnitz and Dr. Samuel Clarke, — a controversy on this, as on other points, eminently worthy of your study. The documents in which this controversy is contained, were published in the English edition under the title, *A collection of Papers which passed between the late learned Mr. Leibnitz and Dr. Clarke, in the years* 1715 *and* 1716, *relating to the Principles of Natural Philosophy and Religion*, London, 1717.[4]

Wolf.

Wolf, the most distinguished follower of Leibnitz, employs the formula — "Nothing is without a sufficient reason why it is, rather than why it is not; that is, if anything is supposed to be (*ponitur esse*), something also must be supposed, whence it may be understood why the same is rather than is not."[5] He blames the schoolmen for confusing reason (*ratio*) with cause (*causa*): but his censure equally applies to his master Leibnitz, as to them and Aristotle; for all of these philosophers, though they did not confound the two principles, employed ambiguous terms to denote them.

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[1] *Metaph.*, iv. (v.) 1. — ED.

[2] *De Divinatione*, ii. c. 28. — ED.

[3] See *Théodicée*, § 44. *Monadologie*, §§ 31, 32. — ED.

[4] See especially Leibnitz's Second Letter, p. 20, in which the principle of Contradiction or Identity is assumed as the foundation of all mathematics and that of Sufficient Reason as the foundation of natural philosophy. — ED.

[5] See Fischer's *Logik*, [§ 59, p. 38, ed. 1838. Compare Wolf, *Ontologia*, §§ 70, 71. — ED.]

Discussion regarding the Leibnitzian doctrine of the law of Sufficient Reason.

The Leibnitian doctrine of the universality of the law of Sufficient Reason, both as a principle of existence and of thought, excited much discussion among the philosophers, more particularly of Germany. In the earlier half of the last century, some controverted the validity of the principle, others attempted to restrict it.[1] Among other arguments, it is alleged, by the advocates of the former opinion, if the principle be admitted, that everything must have a sufficient reason why it is, rather than why it is not, — on this hypothesis, error itself will have such a reason, and, therefore, must cease forthwith to be error.[2]

Many philosophers, as Wolf and Baumgarten, endeavored to demonstrate this principle by the principle of Contradiction; while others, with better success, showed that all such demonstrations were illogical.[3]

In the more recent systems of philosophy, the universality and necessity of the axiom of Reason has, with other logical laws, been controverted and rejected by speculators on the absolute.[4]

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[1] As Feuerlin and Daries. See Bachmann, *Logik*, p. 56, Leipsig, 1828; Cf. Degerando, *Hist. Comp. des Syst. de Phil.*, t. ii. p. 145, ed. 1804. — ED.

[2] See Bachmann, *Logik*, p. 56. With the foregoing history of the laws of Thought, compare the same author, *Logik*, § 18-31. — ED.

[3] [Kiesewetter, *Allgemeine Logik*, P. i. p. 57]; compare *Lectures on Metaphysics*, ii. pp. 396, 397, notes. — ED.

[4] [On principle of Double Negation as another law of Thought, see Fries, *Logik*, § 41, p. 190; Calker, *Denklehre oder Logik und Dialektik*, § 165, p. 453; Beneke, *Lehrbuch der Logik*, § 64, p. 41.]

# LECTURE VI.

## STOICHEIOLOGY.

### SECTION I.—NOETIC.

### THE FUNDAMENTAL LAWS OF THOUGHT—THEIR CLASSIFICATION AND IMPORT.

Recapitulation.

HAVING concluded the Introductory Questions, we entered, in our last Lecture, upon our science itself. The first part of Pure Logic is the Doctrine of Elements, or that which considers the conditions of mere or possible thinking. These elements are of two kinds,—they are either the fundamental laws of thought as regulating its necessary products, or they are the products themselves as regulated by those laws. The fundamental laws are four in number,—the law of Identity, the law of Contradiction, the law of Excluded Middle, the law of Reason and Consequent.[1] The products of thought are three,—1°, Concepts or Notions; 2°, Judgments; and, 3°, Reasonings. In our last Lecture, we considered the first of these two parts of the doctrine of elements, and I went through the general explanation of the contents and import of the four laws, and their history. Without recapitulating what was then stated, I shall now proceed to certain general observations, which may be suggested in relation to the four laws.

General observations in relation to the four fundamental laws of thought. These fall into two classes.

And, first of all, I may remark, that they naturally fall into two classes. The first of these classes consists of the three principles of Identity, Contradiction, and Excluded Middle; the second comprehends the principle of Reason and Consequent alone. This classification is founded both on the different reciprocal connection of the laws, and on the different nature of their results.

In the first place, in regard to the difference of connection between the laws themselves, it is at once evident that the first three stand in a far more proximate relation to each other than to the fourth. The first three are, indeed, so intimately connected, that though it has not even been attempted to carry them up into a higher principle, and though the various and contradictory endeavors that have been made to elevate one or other into an antecedent, and to degrade others into consequents, have only shown, by their failure, the impossibility of reducing the three to one; still so intimate is their connection, that each in fact supposes the others. They are like the three sides of a triangle; not the same, not reducible to unity, each pretending with equal right to a prior consideration, and each, if considered first, giving in its own existence the existence of the other two. This intimacy of relation does not subsist between the principle of Reason and Consequent and the three other laws; they do not, in the same necessary manner, suggest each other in thought. The explanation of this is found in the different nature of their results; and this is the second subject of our consideration.[1]

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[1] See, however, p. 62, note 1.—ED.

This classification founded, 1°, On the difference of connection between the laws themselves.

2°, On the difference of the end which the two classes severally accomplish

In the second place, then, the distinction of the four laws into two classes is not only warranted by the difference of their mutual dependence in thought, but, likewise, by the difference of the end which the two classes severally accomplish. For the first three laws not only stand apart by themselves (forming, as it were, a single principle viewed in three different aspects), but they necessitate a result very different, both in kind and in degree, from that determined by the law of Reason and Consequent. The difference in their result consists in this, — whatever violates the laws, whether of Identity, of Contradiction, or of Excluded Middle, we feel to be absolutely impossible, not only in thought but in existence. Thus we cannot attribute even to Omnipotence the power of making a thing different from itself, of making a thing at once to be and not to be, of making a thing neither to be nor not to be. These three laws thus determine to us the sphere of possibility and of impossibility; and this not merely in thought but in reality, not only logically but metaphysically. Very different is the result of the law of Reason and Consequent. This principle merely excludes from the sphere of positive thought what we cannot comprehend; for whatever we comprehend, that through which we comprehend it is its reason. What, therefore, violates the law of Reason and Consequent merely, in virtue of this law becomes a logical zero; that is, we are compelled to think it as unthinkable, but not to think it, though actually non-existent subjectively or in thought, as therefore actually non-existent objectively or in reality. And why, it may be asked, does the law of Reason and Consequent not equally determine the sphere of general possibility, as the laws of Identity, Contradiction, and Excluded Middle? Why are we to view the unthinkable in the one case not to be equally impossible in reality, as the unthinkable in the other? Some philosophers have, on the one hand, asserted to the Deity the power of reconciling contradictions;[2] while, on the other, a greater number have made the conceivable in human thought the gauge of the possible in existence. What warrants us, it may be asked, to condemn these opposite procedures as equally unphilosophical? In answer to this, though the matter belongs more properly to Metaphysic than to Logic, I may say a few words, which, however, I am aware, cannot, by many of you, be as yet adequately understood.

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[1] For a later development of the Author's philosophy as regards the distinction here indicated, see *Discussions*, p. 602 *et seq.* — Ed.

Two counter opinions regarding the limits of objective possibility.

To deny the universal application of the first three laws, is, in fact, to subvert the reality of thought; and as this subversion is itself an act of thought, it in fact annihilates itself.

The respective spheres of the two classes of the laws of thought defined and illustrated.

To deny the universal application of the first three laws, is to subvert the reality of thought.

When, for example, I say that A is, and then say that A is not, by the second assertion I sublate or take away what, by the first assertion, I posited or laid down; thought, in the one case, undoing by negation what, in the other, it had by affirmation done. But when it is asserted, that A existing and A non-existing are at once true, what does this imply? It implies that negation and affirmation correspond to nothing out of the mind — that there is no agreement, no disagreement between thought and its objects; and this is tantamount to saying that truth and falsehood are merely empty sounds. For if we only think by affirmation and negation, and if these are only as they are exclusive of each other, it follows, that unless existence and non-existence be opposed objectively in the same manner as affirmation and negation are opposed subjectively, all our thought is a mere illusion. Thus it is, that those who would assert the possibility of contradictions being at once true, in fact annihilate the possibility of truth itself, and the whole significance of thought.

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[1] Compare Le Clerc, *Logica*, p. ii. c. 3. — Ed.

But this is not the case when we deny the universal, the absolute application of the law of Reason and Consequent. When I say that a thing may be, of which I cannot conceive the possibility (that is, by conceiving it as the consequent of a certain reason), I only say that thought is limited; but, within its limits, I do not deny, I do not subvert, its truth. But how, it may be asked, is it shown that thought is thus limited? How is it shown that the inconceivable is not an index of the impossible, and that those philosophers who have employed it as the criterion of the absurd, are themselves guilty of absurdity? This is a matter which will come under our consideration at another time and in its proper place; at present it will be sufficient to state in general that the hypothesis which makes the thinkable the measure of the possible, brings the principle of Reason and Consequent at once into collision with the three higher laws, and this hypothesis itself is thus reduced at once to contradiction and absurdity. For if we take a comprehensive view of the phænomena of thought, we shall find that all that we can positively think, that is, all that is within the jurisdiction of the law of Reason and Consequent, lies between two opposite poles of thought, which, as exclusive of each other, cannot, on the principles of Identity and Contradiction, both be true, but of which, on the principle of Excluded Middle, the one or the other must. Let us take, for example, any of the general objects of our knowledge. Let us take body, or rather, since body as extended is included under extension, let us take extension itself, or space. Now, extension alone will exhibit to us two pairs of contradictory inconceivables, that is, in all, four incomprehensibles, but of which, though all are equally unthinkable, and, on the hypothesis in question, all, therefore, equally impossible, we are compelled, by the law of Excluded Middle, to admit some two as true and necessary.

But this is not involved in the denial of the universal application of the law of Reason and Consequent.

This law shown in general not to be the measure of objective possibility.

Extension, then, may be viewed either as a whole or as a part; and, in each aspect, it affords us two incogitable contradictories. 1°, Taking it as a whole: — space, it is evident, must either be limited, that is, have an end, a circumference; or unlimited, that is, have no end, no circumference. These are contradictory suppositions: both, therefore, cannot, but one must, be true. Now let us try positively to comprehend, positively to conceive, the possibility of either of these two mutually exclusive alternatives. Can we represent or realize in thought extension as absolutely limited?

By reference to Extension, 1°, As a Whole.

in other words, can we mentally hedge round the whole of space, conceive it absolutely bounded, that is, so that beyond its boundary there is no outlying, no surrounding, space? This is impossible. Whatever compass of space we may inclose by any limitation of thought, we shall find that we have no difficulty in transcending these limits. Nay, we shall find that we cannot but transcend them; for we are unable to think any extent of space except as within a still ulterior space, of which, let us think till the powers of thinking fail, we can never reach the circumference. It is thus impossible for us to think space as a totality, that is, as absolutely bounded, but all-containing. We may, therefore, lay down this first extreme as inconceivable. We cannot think space as limited.

Space or extension as absolutely bounded, unthinkable.

Let us now consider its contradictory; can we comprehend the possibility of infinite or unlimited space? To suppose this is a direct contradiction in terms; it is to comprehend the incomprehensible. We think, we conceive, we comprehend, a thing, only as we think it as within or under something else; but to do this of the infinite is to think the infinite as finite, which is contradictory and absurd.

Space unlimited inconceivable, as contradictory.

Now, here it may be asked, how have we then the word *infinite?* How have we the notion which this word expresses? The answer to this question is contained in the distinction of positive and negative thought. We have a positive concept of a thing, when we think it by the qualities of which it is the complement. But as the attribution of qualities is an affirmation, as affirmation and negation are relatives, and as relatives are known only in and through each other, we cannot, therefore, have a consciousness of the affirmation of any quality, without having at the same time the correlative consciousness of its negation. Now, the one consciousness is a positive, the other consciousness is a negative notion. But, in point of fact, a negative notion is only the negation of a notion; we think only by the attribution of certain qualities, and the negation of these qualities and of this attribution, is simply, in so far, a denial of our thinking at all. As affirmation always suggests negation, every positive notion must likewise suggest a negative notion; and as language is the reflex of thought, the positive and negative notions are expressed by positive and negative names. Thus it is with the infinite. The finite is the only object of real or positive thought; it is that alone which we think

Objection from the name and notion of the Infinite obviated.

Distinction of positive and negative thought and notion.

The Infinite expressed by negative terms.

by the attribution of determinate characters; the infinite, on the contrary, is conceived only by the thinking away of every character by which the finite was conceived; in other words, we conceive it only as inconceivable. This relation of the infinite to the finite is shown, indeed, in the terms by which it is expressed in every language. Thus in Latin, *infinitum;* in Greek, ἄπειρον; in German, *unendlich;* in all of which original tongues the word expressive of the infinite is only a negative expression of the finite or limited. Thus the very objection from the existence of a name and notion of the infinite, when analyzed, only proves more clearly that the infinite is no object of thought; that we conceive it, not in itself, but only in correlation and contrast to the finite.

The Indefinite and Infinite,—how distinguished.

The indefinite is, however, sometimes confounded with the infinite; though there are hardly two notions which, without being contradictory, differ more widely. The indefinite has a subjective, the infinite an objective relation. The one is merely the negation of the actual apprehension of limits, the other the negation of the possible existence of limits.

Space as bounded and space as unbounded being two inconceivable contradictories, the law of Reason and Consequent cannot, therefore, form the criterion of objective possibility.

But to return whence we have been carried, it is manifest that we can no more realize the thought or conception of infinite, unbounded, or unlimited space, than we can realize the conception of a finite or absolutely bounded space. But these two inconceivables are reciprocal contradictories, and if we are unable to comprehend the possibility of either, while, however, on the principle of Excluded Middle one or other must be admitted, the hypothesis is manifestly false, that proposes the subjective or formal law of Reason and consequent as the criterion of real or objective possibility.

This further shown by reference to Extension. 2°, As a Part.

It is needless to show that the same result is given by the experiment made on extension considered as a part, as divisible. Here, if we attempt to divide extension in thought, we shall neither, on the one hand, succeed in conceiving the possibility of an absolute minimum of space, that is, a minimum *ex hypothesi* extended, but which cannot be conceived as divisible into parts, nor, on the other, of carrying on this division to infinity. But as these are contradictory opposites, they again afford a similar refutation of the hypothesis in question.

But the same conclusion is reached by simply considering the law of Reason and Consequent in itself. This law enjoins — Think nothing without a reason why we must think it; that is, think nothing except as contained in, as evolved out of, something else which we already know. Now, this reason, — this something else, — in obedience to this very law, must, as itself known, be itself a consequent of some other antecedent; and this antecedent be again the consequent of some anterior or higher reason; and so on, *ad infinitum*. But the human mind is not possessed of infinite powers, or of an infinite series of reasons and consequents; on the contrary, its faculties are very limited, and its stock of knowledge is very small. To erect this law, therefore, into a standard of existence, is, in fact, to bring down the infinitude of the universe to the finitude of man, — a proceeding than which nothing can be imagined more absurd. The fact is, that the law of Reason and Consequent can, with the law of Cause and Effect, the law of Substance and Phænomenon, etc., be, if I am not mistaken, all reduced to one higher principle, — a principle which explains from the very limitation of the human mind, from the very imbecility of its powers, a great variety of phænomena, which, from the liberality of philosophers, have obtained for their solution a number of positive and special principles. This, however, is a discussion which would here be out of place.[1] What, however, has been said may suffice to show that, while the first three laws of thought are of an absolute and universal cogency, the fourth is only of a cogency relative and particular; that, while the former determine the possibility, not only of all thought, but of all real knowledge, the latter only regulates the validity of mediate or reflective thought. The laws of Identity, Contradiction and Excluded Middle are, therefore, not only logical but metaphysical principles, the law of Reason and Consequent a logical principle alone; a doctrine which is, however, the converse of what is generally taught.

3°, By reference to the law of Reason and Consequent itself.

The laws of Reason and Consequent, etc., reducible to a higher principle.

Summary statement of the spheres of the laws of thought.

I proceed, now, to say a few words on the general influence which these laws exert upon the operations of thinking. These operations, however various and multiform they may seem, are so governed in all their manifestations by the preceding laws, that no thought can pretend to validity and truth which is not in consonance with, which is not governed by, them. For man can recognize that alone as real and

The general influence which the foregoing laws exert on the operations of thinking.

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[1] See *Discussions*, p. 609. — ED.

assured, which the laws of his understanding sanction; and he cannot but regard that as false and unreal, which these laws condemn. From this, however, it by no means follows that what is thought in conformity to these laws, is therefore true; for the sphere of thought is far wider than the sphere of reality, and no inference is valid from the correctest thinking of an object to its actual existence. While these laws, therefore, are the highest criterion of the non-reality of an object, they are no criterion at all of its reality; and they thus stand to existence in a negative and not in a positive relation. And what I now say of the fundamental principles of thought in general, holds equally of all their proximate and special applications, that is, of the whole of Logic. Logic, as I have already explained, considering the form alone of thought to the exclusion of its matter, can draw no conclusion from the correctness of the manner of thinking an object to the reality of the object itself. Yet among modern, nay recent, philosophers, two opposite doctrines have sprung up, which, on opposite sides, have overlooked the true relations of Logic. "One party of philosophers defining truth in general, — the absolute harmony of our thoughts and cognitions, — divide truth into a formal or logical, and into a material or metaphysical, according as that harmony is in consonance with the laws of formal thought, or, over and above, with the laws of real knowledge.[1] The criterion of formal truth they place in the principles of Contradiction and of Sufficient Reason, enouncing that what is non-contradictory and consequent is formally true. This criterion, which is positive and immediate of formal truth (inasmuch as what is non-contradictory and consequent can always be thought as possible), they style a negative and mediate criterion of material truth: as what is self-contradictory and logically inconsequent is in reality impossible; at the same time, what is not self-contradictory and not logically inconsequent, is not, however, to be regarded as having an actual existence. But here the foundation is treacherous; the notion of truth is false. When we speak of truth, we are not satisfied with knowing that a thought harmonizes with a certain system of thoughts and cognitions; but, over and above, we require to be assured that what we think is real, and is as we think it to be. Are we satisfied on this point, we then regard our thoughts as true; whereas if we are not satisfied of this, we deem them false, how well soever they may quad-

The true relations of Logic overlooked in two ways: — 1. Logic erroneously held to be the positive standard of truth.

The division of truth into logical and metaphysical, — criticized.

Truth, — what.

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[1] See Kant, *Logik*, Einleitung, vii.; Krug, *Logik*, § 22; Fries, *Logik*, § 42. — Ed.

rate with any theory or system. It is not, therefore, in any absolute harmony of mere thought that truth consists, but solely in the correspondence of our thoughts with their objects. The distinction of formal and material truth is thus not only unsound in itself, but opposed to the notion of truth universally held, and embodied in all languages. But if this distinction be inept, the title of Logic, as a positive standard of truth, must be denied; it can only be a negative criterion, being conversant with thoughts and not with things, with the possibility and not with the actuality of existence."[1]

2. The Absolutists proceed on a subversion of the logical laws.

The preceding inaccuracy is, however, of little moment compared with the heresy of another class of philosophers, to whose observations on this point I can, however, only allude. Some of you may, perhaps, find a difficulty in believing the statement, that there is a considerable party of philosophers, illustrious for the highest speculative talent, and whose systems, if not at present, were, a few years ago, the most celebrated, if not the most universally accredited in Europe, who establish their metaphysical theories on the subversion of all logical truth.[2] I refer to those philosophers who hold that man is capable of more than a relative notion of existence, — that he is competent to a knowledge of absolute or infinite being (for these terms they use convertibly), in an identity of knowledge and existence, of himself and the Divinity. This doctrine, which I shall not now attempt to make you understand, is developed in very various schemes; that is, the different philosophers attempt, by very different and contradictory methods, to arrive at the same end; all these systems, however, agree in this, — they are all at variance with the four logical laws. Some, indeed, are established on the express denial of the validity of these laws; and others, without daring overtly to reject their authority, are still built in violation of their precept. In fact, if contradiction remain a criterion of falsehood, if Logic and the laws of thought be not viewed as an illusion, the philosophy of the absolute, in all its forms, admits of the most direct and easy refutation. But on this matter I only now touch, in order that you may not be ignorant that there are philosophers, and philosophers of the highest name, who, in pursuit of the phantom of absolute knowledge, are content to repudiate relative knowledge, logic, and the laws of thought. This hallucination is, however, upon the wane, and as each of these theorists contradicts his brother, Logic and Common Sense will at length refute them all.

Before leaving the consideration of this subject, it is necessary to notice a mistake of Dr. Reid, which it is not more remarkable that he should have committed, than that others have been found to follow and applaud it, as the correction of a general error. In the fourth *Essay on the Intellectual Powers*, and in the third chapter, entitled *Mistakes concerning Conception*,[1] there is the following passage, which at once exhibits not only his own opinion, but the universality of the doctrine to which it is opposed:

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[1] Esser, *Logik*, p. 65-6. — ED.

[2] See above, p. 64, note 4. — ED.

Mistake of Reid in regard to Conception.

"There remains," he says, "another mistake concerning conception, which deserves to be noticed. It is, that our conception of things is a test of their possibility, so that, what we can distinctly conceive, we may conclude to be possible; and of what is impossible, we can have no conception.

Reid quoted

"This opinion has been held by philosophers for more than a hundred years, without contradiction or dissent, as far as I know; and, if it be an error, it may be of some use to inquire into its origin, and the causes that it has been so generally received as a maxim whose truth could not be brought into doubt."

I may here observe that this limitation of the prevalence of the opinion in question to a very modern period is altogether incorrect; it was equally prevalent in ancient times, and as many passages could easily be quoted from the Greek logicians alone as Dr. Reid has quoted from the philosophers of the century prior to himself. Dr. Reid goes on:

"One of the fruitless questions agitated among the scholastic philosophers in the dark ages was, What is the criterion of truth? As if men could have any other way to distinguish truth from error, but by the right use of that power of judgment which God has given them.

"Descartes endeavored to put an end to this controversy, by making it a fundamental principle in his system, that whatever we clearly and distinctly perceive, is true.

"To understand this principle of Descartes, it must be observed that he gave the name of *perception* to every power of the human understanding; and in explaining this very maxim, he tells us that sense, imagination, and pure intellection, are only different modes of perceiving, and so the maxim was understood by all his followers.

"The learned Dr. Cudworth seems also to have adopted this principle. 'The criterion of true knowledge,' he says, 'is only to be looked for in our knowledge and conceptions themselves: for the entity of all theoretical truth is nothing else but clear intelligibility, and whatever is clearly conceived is an entity and a truth; but that which is false, Divine power itself cannot make it to be clearly and distinctly understood. A falsehood can never be clearly conceived or apprehended to be true.' — (*Eternal and immutable Morality*, p. 172, etc.)

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[1] *Collected Works*, p. 376-8. — ED.

"This Cartesian maxim seems to me to have led the way to that now under consideration, which seems to have been adopted as the proper correction of the former. When the authority of Descartes declined, men began to see that we may clearly and distinctly conceive what is not true, but thought that our conception, though not in all cases a test of truth, might be a test of possibility.

"This indeed seems to be a necessary consequence of the received doctrine of ideas; it being evident that there can be no distinct image, either in the mind or anywhere else, of that which is impossible. The ambiguity of the word *conceive*, which we observed, Essay i. chap. i., and the common phraseology of saying, *we cannot conceive such a thing*, when we would signify that we think it impossible, might likewise contribute to the reception of this doctrine.

"But whatever was the origin of this opinion, it seems to prevail universally, and to be received as a maxim.

"'The bare having an idea of the proposition proves the thing not to be impossible; for of an impossible proposition there can be no idea.' — Dr. Samuel Clarke.

"'Of that which neither does nor can exist we can have no idea.' — Lord Bolingbroke.

"'The measure of impossibility to us is inconceivableness, that of which we have no idea, but that reflecting upon it, it appears to be nothing, we pronounce to be impossible.' — Abernethy.

"'In every idea is implied the possibility of the existence of its object, nothing being clearer than that there can be no idea of an impossibility, or conception of what cannot exist.' — Dr. Price.

"'Impossibile est cujus nullam notionem formare possumus; possibile e contra, cui aliqua respondet notio.' — Wolfii *Ontolog.*

"'It is an established maxim in metaphysics, that whatever the mind conceives, includes the idea of possible existence, or in other words, that nothing we imagine is absolutely impossible.' — D. Hume.

"It were easy to muster up many other respectable authorities for this maxim, and I have never found one that called it in question.

"If the maxim be true in the extent which the famous Wolfius has given it in the passage above quoted, we shall have a short road to the determination of every question about the possibility or impossibility of things. We need only look into our own breast, and that, like the Urim and Thummim, will give an infallible answer. If we can conceive the thing, it is possible; if not, it is impossible. And surely every man may know whether he can conceive what is affirmed, or not.

"Other philosophers have been satisfied with one half of the maxim of Wolfius. They say, that whatever we can conceive is possible; but they do not say, that whatever we cannot conceive is impossible."

On this I may remark, that Dr. Reid's criticism of Wolf must be admitted in so far as that philosopher maintains our inability to conceive a thing as possible, to be the rule on which we are entitled to pronounce it impossible. But Dr. Reid now advances a doctrine which I cannot but regard as radically erroneous.

"I cannot help thinking even this to be a mistake which philosophers have been unwarily led into, from the causes before mentioned. My reasons are these:

"1. Whatever is said to be possible or impossible is expressed by a proposition. Now, what is it to conceive a proposition? I think it is no more than to understand distinctly its meaning. I know no more that can be meant by simple apprehension, or conception, when applied to a proposition. The axiom, therefore, amounts to this: — Every proposition, of which you understand the meaning distinctly, is possible. I am persuaded that I understand as distinctly the meaning of this proposition, *Any two sides of a triangle are together equal to the third*, as of this, *Any two sides of a triangle are together greater than the third*; yet the first of these is impossible."

Criticized.

Now this is a singular misunderstanding of the sense in which it has been always held by philosophers, that what is contradictory is conceived as inconceivable and impossible.[1] No philosopher, I make bold to say, ever dreamt of denying that we can distinctly understand the meaning of the proposition, the terms of which we recognize to be contradictory, and, as contradictory, to annihilate each other. When we enounce the proposition, A *is not* A, we clearly comprehend the separate meaning of the terms *A* and *not A*, and also the import of the assertion of their identity. But this very understanding consists in the consciousness that the two terms are contradictories, and that as such it is impossible to unite them in a mental judgment, though they stand united in a verbal proposition. If we attempt this, the two mutually exclusive terms not only cannot be thought as one, but in fact annihilate each other; and thus the result, in place of a positive judgment, is a negation of thought. So far Dr. Reid is wrong. But he is not guilty of the absurdity attributed to him by Dr. Gleig; he does not say, as by that writer he is made to say, that "any two sides of a triangle may be conceived to be equal to the third, as distinctly as any two sides of a triangle may be conceived to be greater than the third."[1] These are not Dr. Reid's words, and nothing he says warrants the attribution of such expressions to him, in the sense in which they are attributed. He is made to hold, not merely that we can understand two terms as contradictory, but that we are able to combine them in the unity of thought. After the passage already quoted, Reid goes on to illustrate, in various points of view, the supposed error of the philosophers; but as all he says on this head originates in the misconception already shown of the opinion he controverts, it is needless to take any further notice of his arguments.

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[1] See the Author's notes, *Reid's Works*, p. 377. — Ed.

Postulates of Logic.

We have thus considered the conditions of Logic, in so far as certain laws or principles are prescribed; we have now to consider its conditions, in so far as certain postulates are demanded. Of these there are more than one: but one alone it is here requisite to signalize; for although it be necessarily supposed in the science, strange to say, it has, by logical writers, not only been always passed over in silence, but frequently and inconsistently violated. This postulate I comprise in the following paragraph:

Par. XVIII. The logical postulate.

¶ XVIII. The only postulate of Logic which requires an articulate enouncement is the demand, that before dealing with a judgment or reasoning expressed in language, the import of its terms should be fully understood; in other words, Logic postulates to be allowed to state explicitly in language all that is implicitly contained in the thought.

This postulate cannot be refused.

This postulate cannot be refused. In point of fact, as I have said, Logic has always proceeded on it, in overtly expressing all the steps of the mental process in reasoning, — all the propositions of a syllogism; whereas, in common parlance, one at least of these steps or propositions is usually left unexpressed. This postulate, as we shall have occasion to observe in the sequel, though a fundamental condition of Logic, has not been consistently acted on by logicians in their development of the science; and from this omission have arisen much confusion and deficiency and error in our present system of Logic. The illustration of this postulate will appropriately find its place on occasion of its applications. I now articulately state it, because it immediately follows in order the general axioms of the science; and, at present, I only beg that you will bear it in mind. I may, however, before leaving the subject, observe (what has already, I believe, been mentioned), that Aristotle states of syllogistic — and, of course, his statement applies to Logic in general — that the doctrine of syllogism deals, not with the external expression of reasoning, in ordinary language, but with the internal reasoning of the mind itself.[1] But of this again, and more fully, in the proper places.

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[1] Art. "Metaphysics," *Encyclopædia Britannica*, 7th edit., p. 620. — ED

**This postulate implied in the doctrine of Syllogism, according to Aristotle.**

In like manner, we might here, as is done in Mathematics, premise certain definitions; but these it will be more convenient to state as they occur in the progress of our development. I therefore pass on to the Second Section of the Doctrine of Elements, which is occupied with the Products of Thought; in other words, with the processes regulated by the previous conditions.

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[1] *Anal. Post.*, i. 10. — Ed.

# LECTURE VII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT.

### I. EXNOEMATIC—OF CONCEPTS OR NOTIONS.

### A. OF CONCEPTS IN GENERAL.

I CONCLUDED, in my last lecture, all that I think it necessary to say in regard to the Fundamental Laws of Thought, or the necessary conditions of the thinkable. The discussion, I am aware, must have been found somewhat dry, and even abstruse; not that there is the smallest difficulty in regard to the apprehension of the laws themselves, for these are all self-evident propositions, but because, though it is necessary in a systematic view of Logic to commence with the elementary principles of thought, it is impossible, in speaking of these and their application, not to employ expressions of the most abstract generality, and even not to suppose a certain acquaintance with words and things, which, however, only find their explanation in the subsequent development of the science.

The products of Thought, Concepts, Judgments and Reasonings

Having considered, therefore, the four Laws of Thought, with the one Postulate of Logic, which constituted the First Section of the Doctrine of Logical Elements, I now proceed to the Second—that which is conversant about Logical Products. These products, though identical in kind, are of three different degrees; for while Concepts, Judgments, and Reasonings, are all equally the products of the same Faculty of Comparison, they still fall into three classes, as the act, and, consequently, the result of the act, is of a greater or a less simplicity. These three degrees are all in fact, strictly, only modifications of the second, as both concepts and reasonings may be reduced to judgments; for the act of judging, that is, the act of affirming or denying one thing of another in thought, is that in which the Understanding or Faculty of Comparison is essentially

These are all products of Comparison, and all modifications of judgment.

expressed. By anticipation: — A concept is a judgment; for, on the one hand, it is nothing but the result of a foregone judgment, or series of judgments, fixed and recorded in a word — a sign; and it is only amplified by the annexation of a new attribute, through a continuance of the same process. On the other hand, as a concept is thus the synthesis or complexion, and the record, I may add, of one or more prior acts of judgment, it can, it is evident, be analyzed into these again; every concept is, in fact, a judgment or a fasciculus of judgments — these judgments only not explicitly developed in thought, and not formally expressed in terms.

Again, a reasoning is a judgment; for a reason is only the affirmation of the connection of two things with a third, and, through that third, with each other. It is thus only the same function of thought, which is at work in Conception, Judgment, and Reasoning; and these express no real, no essential, distinction of operation, but denote only the different relations in which we may regard the indivisible act of thought. Thus, the consideration of concepts cannot be effected out of all relation to, and without even some anticipation of, the doctrine of judgments. This being premised, I now proceed to the consideration of the Products of Thought, viewed in the three relations of the three degrees, of Concepts, Judgments, and Reasonings.[1]

Under the Second Section of Stoicheiology, Concepts or Notions form the first chapter.

I. Of Concepts or Notions. — order of discussion.

Now, in treating of Concepts, the order I shall follow is this: — I shall, in the first place, treat of them in general; in the second, treat of them in special. Under the former, or general head, will be considered, 1°, What they are; 2°, How they are produced. Under the latter, or special head, they will be considered under their various relations. And here, I may observe, that as you obtain no information from Dr. Whately in regard to the primary laws of thought, — these laws being in fact apparently unknown to every British logician, old or new, — so you will find but little or no aid from his *Elements* towards an understanding of the doctrine of concepts. His omission, in this respect, cannot be excused by his error in regard to the object-matter of Logic; that object, you will recollect, being on his view, or rather one of his views, not thought in general, or the products of the comparative faculty in

Whately's omission of the doctrine of Concepts.

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[1] [Hume, *Treatise of Human Nature*, Bk. i. part iii. § 7. Jac. Thomasius, *Physica*, p. 295] [c. xlix. § 112, where he holds that simple apprehension is impossible without judgment. Compare also Krug, *Logik*, § 23, Anm. ii. p. 70. — Ed.]

their three degrees, but reasoning or argumentation alone; for even on the hypothesis that Logic is thus limited, still, as the doctrine of reasoning can only be scientifically evolved out of the doctrine of concepts, the consideration of the latter forms the indispensable condition of a satisfactory treatment of the former. But not only is Whately's doctrine of concepts, or, in his language, of "the process of simple apprehension," meagre and imperfect, it is even necessary to forewarn you that it leads to confusion and error. There is a fundamental distinction of what is called the *Extension* and the *Comprehension* of notions — a distinction which, in fact, as you will find, forms the very cardinal point on which the whole theory of Logic turns. But not only is this distinction not explained, it is not even articulately stated; nay, the very words which logicians have employed for the expression of this contrast, are absolutely used as synonymous and convertible. Instead, therefore, of referring you for information in regard to our present object of consideration, to Dr. Whately, I am sorry to be compelled to caution you against putting confidence in his guidance. But to return. The following I dictate as the title of the first head to be considered:

Whately abusively employs the terms Extension and Comprehension as convertible.

A. Of Concepts or Notions in general. What they are.

A. Of Concepts or Notions in General: What are they?

In answering this question, let us, first, consider the meaning of the expressions; and, secondly, the nature of the thing expressed.

Par. XIX. Concepts, — (a) Meaning of the terms.

¶ XIX. *Concept* or *notion* (ἔννοια, ἐννόημα, νόημα, ἐπίνοια,[1] *conceptio*, *notio*), are terms employed as convertible, but, while they denote the same thing, they denote it in a different point of view. *Conception*, the act of which *concept* is the result, expresses the act of comprehending or grasping up into unity the various qualities by which an object is characterized; *notion* (*notio*), again, signifies either the act of apprehending, signalizing, that is, the remarking or taking note of, the various notes, marks, or characters of an object, which its qualities afford; or the result of that act.

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[1] In Greek, the terms ἔννοια (ἐννοητικός), ἐννόημα (ἐννοηματικός), ἐπίνοια (ἐπινοητικός), νόημα, to say nothing of ἐπινοημα (ἐπινοηματικός), are all more or less objectionable, as all more or less ambiguously used for the object or product of thought, in an act of Conception, or, as it has been usually called by the logicians, Simple Apprehension See Blemmidas, *Epitome Logica* [c. V. Περὶ Επινοίας, p 31, ed. 1605. — ED ]; Eugenios, *Logica* [Λογικὴ, c. ii p. 170, Leipsic, 1766. — ED ] Stephanus, *Thesaurus*, *v.* Νοῦς; Höcker, *Clavis Phil. Arist.*, v. Νοήματα, p. 227 *et seq.*; Micraelius, *Lexicon Philosophicum*, *v.* Νόημα, p. 890. and p. 80, [*v.* Αἰσθήματα. Cf. p. 310. *v.* *Conceptus*; p. 633, *v.* *Intentio*. — ED.] On νοήματα see Aristotle, *De Interpr* . c i and Waitz, *Commentarius*, p. 327. In Aristotle, *De Anima*, l. iii. cc. 6, (7) 7, (8) 8, (9), etc., νοήματα are clearly equivalent to *concepts* in our meaning [c. 6. Ἡ μὲν οὖν τῶν ἀδιαιρέτων νόησις ἐν τούτοις, περὶ ἃ οὐκ ἔστι τὸ ψεῦδος ἐν οἷς δὲ καὶ τὸ ψεῦδος καὶ τὸ ἀληθές, σύνθεσίς τις ἤδη νοημάτων ὥσπερ ἓν ὄντων. κ. τ. λ. — ED.]

Illustrated, — employment of the *animo vel mente concipere*, and *animi conceptus*.

In Latin, the word *concipere*, in its many various applications, always expresses, as the etymology would indicate, the process of *embracing or comprehending the many into the one*, as could be shown by an articulate analysis of the phrases in which the term occurs. It was, accordingly, under this general signification, that this word and its derivatives were analogically applied to the operation of mind. *Animo vel mente concipere*, as used by Cicero, Pliny, Seneca, and other Roman writers, means to *comprehend* or *understand*, that is, to embrace a multitude of different objects by their common qualities into one act of thought; and *animi conceptus* was, in like manner, applied by the ancient writers to denote this operation, or its result. The employment of *concipere*, *conceptus*, and *conceptio*, as technical terms, in the Philosophy of Mind, without the explanatory adjunct, was of a later introduction — was, indeed, only possible after they had been long familiarly used in a psychological relation. But when so introduced, they continued to be employed by philosophers in general in their proper signification as convertible with *thought* or *comprehension*, and as opposed to the mere *apprehension* of Sense or Imagination. Not, indeed, that examples enough may not be adduced of their abusive application to our immediate cognitions of individual objects, long before Mr. Stewart formally applied the term *conception* to a certain accidental form of representation — to the simple reproduction or repetition of an act of perception in imagination.[1] In using the terms *conception* and *concept* in the sense which I have explained, I therefore employ them not only in strict conformity to their grammatical meaning, but to the meaning which they have generally obtained among philosophers.

Of *concipere*, *conceptus*, and *conceptio*, without adjunct.

The term *notion*. — how employed by the Author.

The term *notion*, like *conception*, expresses both an act and its product. I shall, however, as has commonly been done, use it only in this latter relation. This word has, like *conception*, been sometimes abusively applied to denote not only our knowledge of things by their common characters, but, likewise, to include the mere presentations of Sense and representations of Phantasy. This abusive employment has, however, not been so frequent in reference to this term as to the term *conception*; but it must be acknowledged, that nothing can be imagined more vague and vacillating than the meaning attached to *notion* in the writings of all British philosophers, without exception. So much for the expressions *concept* and *notion*. I now go on to that which they express.

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[1] See *Lectures on Metaphysics*, p. 452 *seq.* — ED.

Par. XX. Concepts, — (b) Nature of the thing.

¶ XX.[1] — In our Consciousness — apprehension — of an individual object, there may be distinguished the two following cognitions: — 1°, The immediate and irrespective knowledge we have of the individual object, as a complement of certain qualities or characters, considered simply as belonging to itself. 2°, The mediate and relative knowledge we have of this object, as comprising qualities or characters common to it with other objects.

The former of these cognitions is that contained in the Presentations of Sense, external and internal, and Representations of Imagination. They are only of the individual or singular. The latter is that contained in the Concepts of the Understanding, and is a knowledge of the common, general, or universal.

The conceiving an object is, therefore, its recognition mediately through a concept; and a Concept is the cognition or idea of the general character or characters, point or points, in which a plurality of objects coincide.

Concepts, — their nature illustrated by reference to the history of our knowledge.

Objects are originally presented in confused and imperfect perceptions.

This requires some illustration, and it will be best afforded by considering the history of our knowledge. Our mental activity is not first exerted in an apprehension of the general, common properties of things. On the contrary, objects are originally presented to us in confused and imperfect perceptions. The rude materials furnished by Sense, retained in Memory, reproduced by Reminiscence, and represented in Imagination, the Understanding elaborates into a higher knowledge, simply by means of Comparison and Abstraction. The primary act of Comparison is exerted upon the individual objects of Perception and Imagination

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[1] On this and three following paragraphs apply Leibnitz's distinction of Intuitive and Symbolical Knowledge, see *Opera* II. i. p. 14 *et seq.* — [*Meditationes de Cognitione Veritate, et Ideis.* — Ed.]

Offices of Comparison and Abstraction or attention

alone. In the multitude and complexity of these objects, certain attributes are found to produce similar, others to produce dissimilar, impressions. The observation of this fact determines a reflective consideration of their properties. Objects are intentionally compared together for the purpose of discovering their similarities and differences. When things are found to agree or to disagree in certain respects, the consciousness is, by an act of volition, concentrated upon the objects which thus partially agree, and, in them, upon those qualities in or through which they agree; and by this concentration — which constitutes the act called *Attention* — what is effected? On the objects and qualities, thus attentively considered, a strong light is shed; but precisely in proportion as these are illuminated in consciousness, the others, to which we do not attend, are thrown into obscurity.

Precision, Attention, and Abstraction are correlative names for the same process.

The result of Attention, by concentrating the mind upon certain qualities, is thus to withdraw or abstract it from all else. In technical language, we are said *to prescind* the phænomena which we exclusively consider. *To prescind*, *to attend*, and *to abstract*, are merely different but correlative names for the same process; and the first two are nearly convertible. When we are said *to prescind* a quality, we are merely supposed to attend to that quality exclusively; and when we abstract, we are properly said *to abstract from*, that is, to throw other attributes out of account. I may observe that the term *abstraction* is very often abusively employed. By Abstraction we are frequently said to attend exclusively to certain phænomena, — those, to wit, which we abstract; whereas, the term *abstraction* is properly applied to the qualities which we abstract from; and by abstracting from some, we are enabled to consider others more attentively. Attention and Abstraction are only the same process viewed in different relations. They are, as it were, the positive and negative poles of the same act.[1]

By Comparison, the points of resemblance among things being thus discovered, and by Attention constituted into exclusive objects; by the same act they are also reduced in consciousness from multitude to unity. What is meant by this will be apparent from the following considerations.

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[1] See *Lectures on Metaphysics*, p. 474, and Bachmann, *Logik*, § 44. Compare Kant, *Logik*, § 6; Krug, *Logik*, § 49. — ED. [Schulze, *Logik*, § 28; Drobisch, *Logik*, § 14, p. 11 *et seq.*

The reduction of objects from multitude to unity, — explained and illustrated.

Thought is one and the same, while its contents are identical.

We are conscious to ourselves that we can repeat our acts of consciousness — that we can think the same thought over and over. This act, or this thought, is always in reality the same, though manifested at different times: for no one can imagine that in the repetition of one and the same thought, he has a plurality of thoughts; for he is conscious that it is one and the same thought which is repeated, so long as its contents remain identical.

Objects are to us the same when we are unable to distinguish their cognitions.

Now, this relation of absolute similarity which subsists between the repetitions of the same thought, is found to hold between our representations of the resembling qualities of objects. Two objects have similar qualities only as these qualities afford a similar presentation in sense or a similar representation in imagination, and qualities are to us completely similar, when we are unable to distinguish their cognitions. But what we cannot distinguish, is, to us, the same; therefore, objects which determine undistinguishable impressions upon us, are perceived and represented in the same mental modification, and are subjectively to us precisely as if they were objectively identical.

The consciousness of identity is equally the result of the similarity of any of the partial characters of objects.

But the consciousness of identity is not merely the result of the indiscernible similarity of total objects, it is equally the result of the similarity of any of their parts — partial characters. For by abstracting observation from the qualities, points, in which objects differ, and limiting it to those in which they agree, we are able to consider them as identical in certain respects, however diverse they may appear to be in others, which, for the moment, we throw out of view. For example: let B, C, and D represent a series of individual objects, which all agree in possessing the resembling attributes of *y y y*, and severally differ in each respectively possessing the non-resembling attributes *i*, *o*, *u*. Now, in so far as we exclusively attend to the resembling qualities, we, in the first place, obscure or remove out of view their non-resembling characters *i*, *o*, *u*, while we remain exclusively conscious of their resembling qualities *y y y*. But, in the second place, the qualities expressed by *y y y* determine in us cognitive energies which we are unable to distinguish, and which we, therefore, consider as the same. We therefore view the three similar qualities in the three different objects as also identical; we consider the *y* in this, the *y* in that, and the *y* in the third object, as one; and in so far as the three objects participate in this oneness or identity, we regard them as also the same. In other words, we classify B, C, and D, under *y* ; *y* is the genus ; B, C, and D are its individuals or species, severally distinguished from each other by the non-resembling properties, *i*, *o*, *u*. Now, it is the points of similarity thus discovered and identified in the unity of consciousness, which constitute Concepts or Notions.

Generalization.

It is evident that the same process of Comparison and Abstraction may be again performed on the concepts thus formed. They are, in like manner, compared together, and their points of resemblance noted, exclusively considered, and reduced to one in the synthesis of thought. This process is called *Generalization;* that is, the process of evolving the general or one, out of the individual and manifold.

Concepts or notions superfluously styled *general.*

Notions and concepts are also sometimes designated by the style of *general notions* — *general conceptions.* This is superfluous ; for, in propriety of speech, notions and concepts are, in their very nature, general ; while the other cognitive modifications to which they are opposed, — perceptions and imaginations, — have, in like manner, their essence in their individuality.

*Idea*, — reason why not regularly employed, and sense in which it is occasionally used, by the Author.

By the way, you may have noticed that I never use the term *idea.* The reason of my non-employment of that word is this : There is no possible diversity of meaning in which that term has not been usurped ; and it would only confuse you, were I to attempt to enumerate and explain them. I may, however, occasionally not eschew the word ; but if you ever hear it from me, I beg you to observe, that I apply it, in a loose and general signification, to comprehend the presentations of Sense, the representations of Phantasy, and the concepts or notions of the Understanding. We are in want of a generic term to express these ; and the word *representation* (*repraesentatio*), which, since the time of Leibnitz, has been commonly used by the philosophers of the Continent, I have restricted to denote, what it only can in propriety express, the immediate object or product of Imagination. We are, likewise, in want of a general term to express what is common to the presentations of Perception, and the representations of Phantasy, that is, their individuality and immediacy. The Germans express this by the term *Anschauung*, which can only be translated by *intuition* (as it is in Latin by Germans), which literally means *a looking at.* This expression has, however, been preöccupied in English to denote the apprehension we have of self-evident truths, and its application in a different signification, would therefore be, to a certain extent, liable to ambiguity. I shall, therefore, continue, for the present at least, to struggle on without such a common term, though the necessity thus imposed of always opposing presentation and representation to concept is both tedious and perplexing.

General Characters of Concepts.

Par. XXI. (a) A Concept affords only inadequate knowledge.

¶ XXI. A concept or notion thus involves — 1°. The representation of a part only of the various attributes or characters of which an individual object is the sum; and, consequently, affords only a one-sided and inadequate knowledge of the things which are thought under it.

Explication.

This is too simple to require any commentary. It is evident that when we think Socrates by any of the concepts, — *Athenian*, *Greek*, *European*, *man*, *biped*, *animal*, *being*,— we throw out of view the far greater number of characters of which Socrates is the complement, and those, likewise, which more proximately determine or constitute his individuality. It is, likewise, evident, that in proportion as we think him by a more general concept, we shall represent him by a smaller bundle of attributes, and, consequently, represent him in a more partial and one-sided manner. Thus, if we think him as *Athenian*, we shall think him by a greater number of qualities than if we think him by *Greek;* and, in like manner, our representation will be less and less adequate, as we think him by every higher concept in the series, — *European*, *man*, *biped*, *animal*, *being*.

Par. XXII. (b) A Concept affords no absolute object of knowledge.

¶ XXII. 2°, A concept or notion, as the result of a comparison, necessarily expresses a relation. It is, therefore, not cognizable in itself; that is, it affords no absolute or irrespective object of knowledge, but can only be realized in consciousness by applying it, as a term of relation, to one or more of the objects, which agree in the point or points of resemblance which it expresses.

In this paragraph (if I may allude to what you may not all be aware of) is contained a key to the whole mystery of Generalization and General Terms; for the whole disputes between the Conceptualists and Nominalists (to say nothing of the Realists) have only arisen from concepts having been regarded as affording an irrespective and independent object of thought.[1] This illusion has arisen from a very simple circumstance. Objects compared together are found to possess certain attributes, which, as producing indiscernible modifications in us, are to us absolutely similar. They are, therefore, considered the same. The relation of similarity is thus converted into identity, and the real plurality of resembling qualities in nature is factitiously reduced to a unity of thought; and this unity obtains a name in which its relativity, not being expressed, is still further removed from observation.

This paragraph contains a key to the mystery of Generalization and General Terms.

But the moment we attempt to represent to ourselves any of these concepts, any of these abstract generalities, as absolute objects, by themselves, and out of relation to any concrete or individual realities, their relative nature at once reäppears; for we find it altogether impossible to represent any of the qualities expressed by a concept, except as attached to some individual and determinate object; and their whole generality consists in this, — that though we must realize them in thought under some singular of the class, we may do it under any. Thus, for example, we cannot actually represent the bundle of attributes contained in the concept *man*, as an absolute object, by itself, and apart from all that reduces it from a general cognition to an individual representation. We cannot figure in imagination any object adequate to the general notion or term *man*; for the man to be here imagined must be neither tall nor short, neither fat nor lean, neither black nor white, neither man nor woman, neither young nor old, but all and yet none of these at once. The relativity of our concepts is thus shown in the contradiction and absurdity of the opposite hypothesis.

Wherein consists the generality of a concept.

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[1] For a full account of this dispute, see *Lectures on Metaphysics*, p. 477 *et seq.* — ED.

# LECTURE VIII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### I.—ENNOEMATIC.

### A. OF CONCEPTS IN GENERAL; B. IN SPECIAL—I. THEIR OBJECTIVE RELATION—QUANTITY.

Recapitulation. with further explanation and illustration.

In our last Lecture, we began the Second Section of Stoicheiology,—the consideration of the Products of Thought. The product of thought may be considered as Concepts, as Judgments, and as Reasonings; these, however, are not to be viewed as the results of different faculties, far less as processes independent of each other, for they are all only the product of the same energy in different degrees, or rather in simpler or more complex applications to its objects.

In treating of Concepts, which form the subject of the First Chapter of this Second Section, I stated that I should first consider them in general, and then consider them in special; and, in my last Lecture, I had nearly concluded all that I deem it requisite under the former head to state, in regard to their peculiar character, their origin, and their general accidents. I, first of all, explained the meaning of the two terms, *concept* and *notion*,—words convertible with each other, but still severally denoting a different aspect of the simple operation, which they equally express. *Notion* being relative to and expressing the apprehension,—the remarking,—the taking note of, the resembling attributes in objects; *concept*, the grasping up or synthesis of these in the unity of thought.

Having shown what was properly expressed by the terms *notion* and *concept*, or *conception*, I went on to a more articulate explanation of that which they were employed to denote. And here I again stated what a Concept or Notion is in itself, and in contrast to a Presentation of Perception, or Representation of Phantasy. Our knowledge through either of the latter, is a direct, immediate, irrespective, determinate, individual, and adequate cognition; that is, a singular or individual object is known in itself, by itself, through all its attributes, and without reference to aught but itself. A concept, on the contrary, is an indirect, mediate, relative, indeterminate, and partial cognition of any one of a number of objects, but not an actual representation either of them all, or of the whole attributes of any one object.

Though it be not strictly within the province of Logic to explain the origin and formation of our notions, the logician assuming, as data, the laws and products of thought, as the mathematician assumes, as data, extension and number and the axioms by which their relation is determined, both leaving to the metaphysician the inquiry into their grounds; — this notwithstanding, I deemed it not improper to give you a very brief statement of the mode and circumstances in which our concepts are elaborated out of the presentations and representations of the subsidiary faculties. Different objects are complements partly of similar, partly of different, attributes. Similar qualities are those which stand in similar relation to our organs and faculties, and where the similarity is complete, the effects which they determine in us are, by us, indiscernible. To us they are, therefore, virtually the same, and the same we, accordingly, consider them to be, though in different objects; precisely as we consider the thought of the same object to be itself the same, when repeated at intervals — at different times — in consciousness. This, by way of preface, being understood, I showed that, in the formation of a concept or notion, the process may be analyzed into four momenta. In the first place, we must have a plurality of objects presented or represented by the subsidiary faculties. These faculties must furnish the rude material for elaboration. In the second place, the objects thus supplied are, by an act of the Understanding, compared together, and their several qualities judged to be similar or dissimilar. In the third place, an act of volition, called Attention, concentrates consciousness on the qualities thus recognized as similar; and that concentration, by attention on them, involves an abstraction of consciousness from those which have been recognized and thrown aside as dissimilar; for the power of consciousness is limited, and it is clear or vivid precisely in proportion to the simplicity or oneness of its object. Attention and Abstraction are the two poles of the same act of thought; they are like the opposite scales in a balance — the one must go up as the other goes down. In the fourth place, the qualities, which by comparison are judged similar, and by attention are constituted into an exclusive object of thought, — these are already, by this process, identified in consciousness; for they are only judged similar, inasmuch as they produce in us indiscernible effects. Their synthesis in consciousness may, however, for precision's sake, be stated as a fourth step in the process; but it must be remembered, that at least the three latter steps are not, in reality, distinct and independent acts, but are only so distinguished and stated, in order to enable us to comprehend and speak about the indivisible operation, in the different aspects in which we may consider it. In the same way, you are not to suppose that the mental sentence which must be analyzed in order to be expressed in language, has as many parts in consciousness, as it has words, or clauses, in speech; for it forms, in reality, one organic and indivisible whole. To repeat an illustration I have already given, — the parts of an act of thought stand in the same relation to each other as the parts of a triangle, — a figure which we cannot resolve into any simpler figure, but whose sides and angles we may consider apart, and, therefore, as parts; though these are, in reality, inseparable, being the necessary conditions of each other. But this by the way.

The qualities of different individual things, thus identified in thought, and constituting concepts, under which, as classes, these individual things themselves are ranged; — these primary concepts may themselves be subjected to the same process, by which they were elaborated from the concrete realities given in Perception and Imagination. We may, again, compare different concepts together, again find in the plurality of attributes which they comprehend, some like, some unlike; we may again attend only to the similar, and again identify these in the synthesis of consciousness; and this process of evolving concepts out of concepts we may go on performing, until the generalization is arrested in that ultimate or primary concept, the basis itself of all attributes, — the concept of Being or Existence.

Having thus endeavored to give you a general view of what concepts are, and by what process they are formed, I stated, by way of corollary, some of their general characteristics. The first of these I mentioned is their partiality or inadequacy; that is, they comprehend only a larger or smaller portion of the whole attributes belonging to the things classified or contained under them.

Relativity of Concepts.

The second is their relativity. Formed by comparison, they express only a relation. They cannot, therefore, be held up as an absolute object to consciousness, — they cannot be represented, as universals, in imagination. They can only be thought of in relation to some one of the individual objects they classify, and when viewed in relation to it, they can be represented in imagination; but then, as so actually represented, they no longer constitute general attributions, they fall back into more special determinations of the individual object in which they are represented. Thus it is, that the generality or universality of concepts is potential, not actual. They are only generals, inasmuch as they may be applied to any of the various objects they contain; but while they cannot be actually elicited into consciousness, except in application to some one or other of these, so, they cannot be so applied without losing, *pro tanto*, their universality. Take, for example, the concept *horse*. In so far as by *horse* we merely think of the word, that is, of the combination formed by the letters *h*, *o*, *r*, *s*, *e*, — this is not a concept at all, as it is a mere representation of certain individual objects. This I only state and eliminate, in order that no possible ambiguity should be allowed to lurk. By *horse*, then, meaning not merely a representation of the word, but a concept relative to certain objects classed under it; — the concept *horse*, I say, cannot, if it remain a concept, that is, a universal attribution, be represented in imagination; but, except it be represented in imagination, it cannot be applied to any object; and, except it be so applied, it cannot be realized in thought at all. You may try to escape the horns of the dilemma, but you cannot. You cannot realize in thought an absolute or irrespective concept, corresponding in universality to the application of the word; for the supposition of this involves numerous contradictions. An existent *horse* is not a relation, but an extended object possessed of a determinate figure, color, size, etc.; *horse*, in general, cannot, therefore, be represented, except by an image of something extended, and of a determinate figure, color, size, etc. Here now emerges the contradiction. If, on the one hand, you do not represent something extended and of a determinate figure, color, and size, you have no representation of any horse. There is, therefore, on this alternative, nothing which can be called the actual concept or image of a horse at all. If, on the other hand, you do represent something extended and of a determinate figure, color, and size, then you have, indeed, the image of an individual horse, but not a universal concept coadequate with *horse* in general. For how is it possible to have an actual representation of a figure, which is not a determinate figure? but if of a determinate figure, it must be that of some one of the many different figures under which horses appear; but then, if it be only of one of these, it cannot be the general concept of the others, which it does not represent. In like manner, how is it possible to have the actual representation of a thing colored, which is not the

Concepts have a potential, not an actual, universality.

representation of a determinate color, that is, either white, or black, or gray, or brown, etc.? but if it be any one of these, it can only represent a horse of this or that particular color, and cannot be the general concept of horses of every color. The same result is given by the other attributes; and what I originally stated is thus manifest, — that concepts have only a potential, not an actual, universality; that is, they are only universal, inasmuch as they may be applied to any of a certain class of objects, but as actually applied, they are no longer general attributions, but only special attributes.

But concepts are not, therefore, mere words.

But it does not from this follow that concepts are mere words, and that there is nothing general in thought itself. This is not indeed held in reality by any philosopher; for no philosopher has ever denied that we are capable of apprehending relations, and in particular the relation of similarity and difference; so that the whole controversy between the conceptualist and nominalist originates in the ambiguous employment of the same terms to express the representations of Imagination and the notions or concepts of the understanding. This is significantly shown by the absolute non-existence of the dispute among the philosophers of the most metaphysical country in Europe. In Germany, the question of nominalism and conceptualism has not been agitated, and why? Simply because the German language supplies terms by which concepts (or notions of thought proper) have been contradistinguished from the presentations and representations of the subsidiary faculties.[1] But this is not a subject on which I ought at present to have touched, as it is, in truth, foreign to the domain of Logic; and I have only been led now to recur to it at all, in consequence of some difficulties expressed to me by members of the class. All that I wish you now to understand is — that concepts, as the result of comparison, that is, of the apprehension and affirmation of a relation, are necessarily, in their nature relative, and, consequently, not capable of representation as absolute attributes. I shall terminate the consideration of concepts in general by the following paragraph, in which is stated, besides their inadequacy and relativity, their dependence on language:

¶ XXIII. The concept thus formed by an abstraction of the resembling from the non-resembling qualities of objects, would again fall back into the confusion and infinitude from which it has been called out, were it not rendered permanent for consciousness, by being fixed and ratified in a verbal sign. Considered in general, thought and language are reciprocally dependent; each bears all the imperfections and perfections of the other; but without language there could be no knowledge realized of the essential properties of things, and of the connection of their accidental states.

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[1] See the Author's note, *Reid's Works*, p. 412; and *Lectures on Metaphysics*, p. 477 *et seq* — ED

Par. XXIII. Concepts,—(c) Their dependence on Language.

The relation of Language to Thought, and the influence which it exerts on our mental operations

This also is not a subject of which the consideration properly belongs to Logic, but a few words may not be inexpedient to make you aware, in general, of the intimate connections of thought and its expression, and of the powerful influence which language exerts upon our mental operations. Man, in fact, only obtains the use of his faculties in obtaining the use of speech; for language is the indispensable mean of the development of his natural powers, whether intellectual or moral.

Language unnecessary in certain mental operations.

For Perception, indeed, for the mere consciousness of the similarities and dissimilarities in the objects perceived, for the apprehension of the causal connection of certain things, and for the application of this knowledge to the attainment of certain ends, no language is necessary; and it is only the exaggeration of a truth into an error, when philosophers maintain that language is the indispensable condition of even the simpler energies of knowledge. Language is the attribution of signs to our cognitions of things. But as a cognition must have been already there, before it could receive a sign; consequently, that knowledge which is denoted by the formation and application of a word, must have preceded the symbol which denotes it. Speech is thus not the mother, but the godmother, of knowledge. But though, in general, we must hold that language, as the product and correlative of thought, must be viewed as posterior to the act of thinking itself; on the other hand, it must be admitted, that we could never have risen above the very lowest degrees in the scale of thought, without the aid of signs. A sign is necessary, to give stability to our intellectual progress,—to establish each step in our advance as a new starting-point for our advance to another beyond.

A country may be overrun by an armed host, but it is only conquered by the establishment of fortresses. Words are the fortresses of thought. They enable us to realize our dominion over what we have already overrun in thought; to make every intellectual conquest the basis of operations for others still beyond. Or another illustration: You have all heard of the process of tunnelling, of tunnelling through a sand-bank. In this operation it is impossible to succeed, unless every foot, nay almost every inch in our progress, be secured by an arch of masonry, before we attempt the excavation of another. Now, language is to the mind precisely what the arch is to the tunnel. The power of thinking and the power of excavation are not dependent on the word in the one case, on the mason-work in the other; but without these subsidiaries, neither process could be carried on beyond its rudimentary commencement. Though, therefore, we allow that every movement forward in language must be determined by an antecedent movement forward in thought; still, unless thought be accompanied at each point of its evolution, by a corresponding evolution of language, its further development is arrested. Thus it is, that the higher exertions of the higher faculty of Understanding, — the classification of the objects presented and represented by the subsidiary powers in the formation of a hierarchy of notions, the connection of these notions into judgments, the inference of one judgment from another, and, in general, all our consciousness of the relations of the universal to the particular, consequently all science strictly so denominated, and every inductive knowledge of the past and future from the laws of nature: — not only these, but all ascent from the sphere of sense to the sphere of moral and religious intelligence, are, as experience proves, if not altogether impossible without a language, at least possible to a very low degree.

Mental operations to which language is indispensable, and its relation to these

Admitting even that the mind is capable of certain elementary concepts without the fixation and signature of language, still these are but sparks which would twinkle only to expire; and it requires words to give them prominence, and, by enabling us to collect and elaborate them into new concepts, to raise out of what would otherwise be only scattered and transitory scintillations a vivid and enduring light.

B. Of Concepts or Notions in special.

I here terminate the General and proceed to the Special consideration of Concepts — that is, to view them in their several Relations. Now, in a logical point of view, there are, it seems to me, only three possible relations in which concepts can be considered; for the only relations they hold are to their objects, to their subject, or to each other. In relation to their objects, — they are considered as inclusive of a greater or smaller number of attributes, that is, as applicable to a greater or smaller number of objects; this is technically styled their *Quantity*. In relation to their subject, that is, to the mind itself, they are considered as standing in a higher or a lower degree of consciousness, — they are more or less clear, more or less distinct; this, in like manner, is called their *Quality*. In relation to each other, they are considered as the same or different, coördinated or subordinated to each other; this is their *Relation*, strictly so called.[1] Under these three heads I now, therefore, proceed to treat them; and, first, of their Quantity.

Par. XXIV. Quantity of Concepts of two kinds, Intensive and Extensive.

¶ XXIV. As a concept, or notion, is a thought in which an indefinite plurality of characters is bound up into a unity of consciousness, and applicable to an indefinite plurality of objects, a concept is, therefore, necessarily a quantity, and a quantity varying in amount according to the greater or smaller numbers of characters of which it is the complement, and the greater or smaller number of things of which it may be said. This quantity is thus of two kinds; as it is either an Intensive or an Extensive. The Internal or Intensive Quantity of a concept is determined by the greater or smaller number of constituent characters contained in it. The External or Extensive Quantity of a concept is determined by the greater or smaller number of classified concepts or realities contained under it. The former (the Intensive Quantity) is called by some latter Greek logicians the *depth* (*βάθος*), by the Latin logical writers the *comprehension* (*comprehensio*, *quantitas comprehensionis*, *complexus*, or *quantitas complexus*). The latter (the Extensive Quantity) is called by the same latter Greek Logicians, the *breadth* (*πλάτος*); by Aristotle, *ἡ περιοχὴ*, *τὸ περιέχειν*, *τὸ περιέχεσθαι*;[2] by the logical writers of the western or Latin world, the *extension* or *circuit* (*extensio*, *quantitas extensionis*,

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[1] On their relation to their origin as direct or indirect, see Esser. [*System der Logik*, § 49, p. 93. — Ed.]

Mem. — N. B. Notions may be thus better divided :—

1°. By relation to themselves they have the quantity of comprehension.

2°. By relation to their objects they have the quantity of extension. These two thus quantity in general.

3°. By relation to each other they have relation strictly so called.

4°. By relation to their subject they have clearness and distinctness.

(This last had better be relegated to Methodology.) — *Memoranda.*

[2] See *Lectures on Metaphysics*, p. 474 n. Aristotle does not use περιοχὴ as a substantive, though the verb, both active and passive, is employed in this signification, *e. g.* *Anal. Prior* i. 27; *Rhet.* iii. 5. — Ed.

*ambitus*, *quantitus ambitus*); and likewise the *domain* or *sphere* of a notion (*regio*, *sphæra*).[1]

General Explication.

The Internal Quantity of a notion, its Intension or Comprehension, is made up of those different attributes of which the concept is the conceived sum; that is, the various characters connected by the concept itself into a single whole in thought. The External Quantity of a notion or its extension is, on the other hand, made up of the number of objects which are thought mediately through a concept. For example, the attributes *rational*, *sensible*, *moral*, etc., go to constitute the intension or internal quantity of the concept *man;* whereas the attributes *European*, *American*, *philosopher*, *tailor*, etc., go to make up a concept of this or that individual man. These two quantities are not convertible. On the contrary, they are in the inverse ratio of each other; the greater the depth or comprehension of a notion the less its breadth or extension, and *vice versâ.* You will observe, likewise, a distinction which has been taken by the best logicians. Both quantities are said *to contain;* but the quantity of extension is said to contain *under* it; the quantity of comprehension is said to contain *in* it.

By the intension, comprehension, or depth of a notion, we think the most qualities of the fewest objects; whereas by the extension or breadth of a concept, we think the fewest qualities of the most objects. In other words, by the former, we say the most of the least; by the latter, the least of the most.

Again; you will observe the two following distinctions: the first, — the exposition of the comprehension of a notion is called its *Definition* (a simple notion cannot, therefore, be defined); the second, — the exposition of the Extension of a notion is called its *Division* (an individual notion cannot be divided).

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[1] [Cf. *Porphyrii*, *Isagoge*, cc. i. ii. viii; Cajetan, *In Porphyrii Prædicabilia*, cc. i. ii [p. 37 ed. 1579; prefixed to his Commentary on the *Categories*, first published in 1496. "Ad hoc breviter dicitur, quod esse magis collectivum multorum potest intelligi dupliciter: uno modo *intensive*, et sic species magis est collectiva, quia magis unit adunata; alio modo *extensive*, et sic genus est magis collectivum, quia multo plura sub sua adunatione cadunt, quam sub speciei ambitu. Unde species et genus se habent sicut duo duces, quorum alter habet exercitum parvum sed valde unanimem, alter exercitum magnum, sed diversarum factionum. Ille enim magis colligit intensive, hic extensive. Porphyrius autem loquebatur hic de extensiva collectione, ideo dixit, genus esse magis collectivum." Quoted by Stahl, *Regulæ Philosophicæ*, tit. xii., reg. 5, p. 381. Cf. reg. 6, ed. London, 1658. — ED.] [*Port-Royal Logic*, P. i. c. 6, p. 74, ed. 1718. Boethius, *Introductio ad Syllogismos*, *Opera*, p. 562: *In Topica Ciceronis Commentarii*, lib. i., *Opera*, p. 765, ed. Basilæ, 1570. Reuschius, *Systema Logicum*, pp. 11, 92; Baumgarten, *Acroasis Logica*, §§ 56, 57, ed. Halæ Magdeburgæ, 1773. Krug, *Logik*, § 26; Schulze, *Logik*, § 30; Esser, *Logik*, § 34 *et seq.;* Eugenios, p. 194 *et seq.* [Λογική, c. iv., Περὶ Ἐννοιῶν Βάθους τε καὶ Πλάτους. — ED.]

Special illustration of Paragraph. — A concept is a quantity.

What follows is in further illustration of the paragraph. Notions or concepts stand in a necessary relation to certain objects, thought through them; for without something to think of, there could exist no thought, no notion, no concept. But in so far as we think an object through a concept, we think it as part of, or as contained under, that concept: and in so far as we think a concept of its object or objects, we think it as a unity containing, actually or potentially, in it a plurality of attributions. Out of the relation of a concept to its object it necessarily results, that a concept is a quantum or quantity; for that which contains one or more units by which it may be measured, is a quantity.

This quantity of two kinds: — 1. Intensive.

But the quantity of a concept is of two, and two opposite, kinds. Considered internally, that is, as a unity which may, and generally does, contain in it a plurality of parts or component attributes, a concept has a certain quantity, which may be called its *internal* or *intensive* quantity. This is generally called its *comprehension*, sometimes its *depth*, *βάθος*, and its *quantitas complexus*. Here, the parts, that is, the several attributes or characters, which go to constitute the total concept, are said to be contained *in* it. For example, the concept *man* is composed of two constituent parts or attributes, that is, of two partial concepts, — *rational* and *animal;* for the characters *rational* and *animal* are only an analytical expression of the synthetic unity of the concept *man*. But each of these partial concepts, which together make up the comprehension of the total concept *man*, are themselves wholes, made up in like manner of parts. To take only the concept *animal ;* — this comprehends in it, as parts, *living* and *sensitive* and *organized*, for a living and sentient organism may be considered as an analytical development of the constituents of the synthetic unity *animal*. But each of these, again, is a concept, comprehending and made up of parts; and these parts, again, are relative wholes, divisible into other constituent concepts; nor need we stop in our analysis till we reach attributes which, as simple, stand as a primary or ultimate element, into which the series can be resolved. Now, you will observe, that as the parts of the parts are parts of the whole, the concept *man*, as immediately comprehending the concepts *rational* and *animal*, mediately comprehends their parts, and the parts of their parts, to the end of the evolution. Thus, we can say, not only that *man* is an *animal*, but that he is a *living being*, a *sentient being*, etc. The logical axiom, *Nota notæ est nota rei ipsius*, or, as otherwise expressed, *Prædicatum prædicati est prædicatum subjecti*,[1] — is only a special enunciation of the general principle, that the part of a part is a part of the whole. You will, hereafter, see that the Comprehension of notions affords one of the two great branches of reasoning, which, though marvellously overlooked by logicians, is at least of equal importance with that which they have exclusively developed, and which is founded on the other kind of quantity exhibited by concepts, and to which I now proceed.

2. Extensive.

But a concept may also be considered externally, that is, as a unity which contains under it a plurality of classifying attributes or subordinate concepts, and, in this respect, it has another quantity which may be called its *external* or *extensive* quantity. This is commonly called its *extension;* sometimes its *sphere* or *domain*, *sphæra*, *regio*, *quantitas ambitus;* and, by the Greek logicians, its *breadth* or *latitude*, πλάτος.[2] Here the parts which the total concept contains, are said to be contained *under* it, because, holding the relation to it of the particular to the general, they are subordinated or ranged under it. For example, the concepts *man*, *horse*, *dog*, etc., are contained under the more general concept *animal*, — the concepts *triangle*, *square*, *circle*, *rhombus*, *rhomboid*, etc., are contained under the more general concept *figure;* inasmuch as the subordinate concepts can each or any be thought through the higher or more general. But as each of these subordinate concepts is itself a whole or general, which contains under it parts or more particular concepts, it follows, again, on the axiom or self-evident truth that a part of a part is a part of the whole, — an axiom which, you will hereafter see, constitutes the one principle of all Deductive reasoning, — it follows, on this axiom, that whatever is contained under the partial or more particular concept, is contained under the total or more general concept. Thus, for example, *triangle* is contained under *figure;* all, therefore, that is contained under *triangle*, as *rectangled triangle*, *equilateral triangle*, etc., will, likewise, be contained under *figure*, by which we may, accordingly, think and describe them.

Such, in general, is what is meant by the two quantities of concepts — their Comprehension and Extension.

Intensive and Extensive quantities are opposed to each other.

But these quantities are not only different, they are opposed, and so opposed, that though each supposes the other as the condition of its own existence, still, however, within the limits of conjunct, of correlative existence, they stand in an inverse ratio to each other, — the maximum of the one being the minimum of the other. On this I give you the following paragraph :

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[1] A translation of Aristotle's first antipredicamental rule, *Categ.*, iii. 1. Ὅσα κατὰ τοῦ κατηγορουμένου λέγεται πάντα καὶ κατὰ τοῦ ὑποκειμένου ῥηθήσεται. — ED.

[2] See above, p. 100, note 2, p. 101, note 1. — ED.

Par. XXV. Law regulating the mutual relations of Extension and Comprehension

¶ XXV. A notion is intensively great in proportion to the greater number, and intensively small in proportion to the smaller number, of determinations or attributes contained in it. Is the Comprehension of a concept a minimum, that is, is the concept one in which a plurality of attributes can no longer be distinguished, it is called *simple ;* whereas, inasmuch as its attributes still admit of discrimination, it is called *complex* or *compound*.[1]

A notion is extensively great in proportion to the greater number, and extensively small in proportion to the smaller number, of determinations or attributes it contains under it. When the Extension of a concept becomes a minimum, that is, when it contains no other notions under it, it is called an *individual*.[2]

These two quantities stand always in an inverse ratio to each other: For the greater the Comprehension of a concept, the less is its Extension; and the greater its Extension, the less its Comprehension.[3]

Illustration.

To illustrate this: When I take out of a concept, that is, abstract from one or more of its attributes, I diminish its comprehension. Thus, when from the concept *man*, equivalent to *rational animal*, I abstract from the attribute or determination *rational*, I lessen its internal quantity. But by this diminution of its comprehension I give it a wider extension; for what remains is the concept *animal*, and the concept *animal* embraces under it a far greater number of objects than the concept *man*.

Before, however, proceeding further in illustrating the foregoing paragraph, it may be proper to give you also the following:

Par. XXVI. Processes by which the Comprehension and Extension of Notions are amplified and resolved.

¶ XXVI. Of the logical processes by which these counter quantities of concepts are amplified, — the one which amplifies the Comprehension is called *Determination*, and sometimes called *Concretion*, the other which amplifies the Extension is called *Abstraction* or *Generalization*. *Definition* and *Division* are sever-

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[1] Krug, *Logik*, § 28. — Ed.

[2] Krug, *ibid.*, § 29. — Ed.

[3] Krug, *Logik*, § 27. — Ed.; [Schulze, *Logik*, § 33. Cf. Porphyry, *Isagoge*, c. viii §§ 9, 10.] [Ἔτι τὰ μὲν γένη πλεονάζει τῇ τῶν ὑπ' αὐτὰ εἰδῶν περιοχῇ τὰ δὲ εἴδη τῶν γενῶν πλεονάζει ταῖς οἰκείαις διαφοραῖς. Ἔτι οὔτε τὸ εἶδος γένοιτ' ἂν γενικώτατον· οὔτε τὸ γένος εἰδικώτατον. — Ed.]

> ally the resolution of the Comprehension and of the Extension of notions, into their parts. A Simple notion cannot be defined; an Individual notion cannot be divided.[1]

Illustration of the two foregoing paragraphs.

The reason of this opposition of the two quantities is manifest in a moment, from the consideration of their several natures. The comprehension of a concept is nothing more than a sum or complement of the distinguishing characters, attributes, of which the concept is made up; and the extension of a concept is nothing more than the sum or complement of the objects themselves, whose resembling characters were abstracted to constitute the concept. Now, it is evident, that the more distinctive characters the concept contains, the more minutely it will distinguish and determine, and that if it contain a plenum of distinctive characters, it must contain the distinctive — the determining — characters of some individual object. How do the two quantities now stand? In regard to the comprehension or depth, it is evident, that it is here at its maximum, the concept being a complement of the whole attributes of an individual object, which, by these attributes, it thinks and discriminates from every other. On the contrary, the extension or breadth of the concept is here at its minimum; for, as the extension is great in proportion to the number of objects to which the concept can be applied, and as the object is here only an individual one, it is evident that it could not be less, without ceasing to be at all. Again, to reverse the process: throwing out of the comprehension of the concept, that is, abstracting from those attributes, which belonging exclusively to, exclusively distinguish, the individual, — we at once diminish the comprehension, by reducing the sum of its attributes, and amplify the extension of the concept, by bringing within its sphere all the objects, which the characteristics, now thrown out of the comprehension, had previously excluded from the extension. Continuing the process, by abstraction we throw out of the sum of qualities constituting the comprehension, other discriminating attributes, and forthwith the extension is proportionally amplified, by the entrance into its sphere of all those objects which had previously been debarred by the determining characteristics last discarded. Thus proceeding, and at each step ejecting from the comprehension those characters

Comprehension and Extension are opposed in an inverse ratio to each other.

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[1] [Synonyms of Abstraction: — 1, Analysis (of Comprehension); 2, Synthesis; 3, Generification; 4, Induction; 5, Amplification.

**Synonyms of Determination or Concretion:** — 1. Analysis (of Extension); 2. Synthesis; 3. Specification; 4, Restriction; 5, Individuation.]

which are found the proximate impediments to the amplification of the extension of the concept, we at each step diminish the former quantity precisely as we increase the latter; till, at last, we arrive at that concept which is the necessary constituent of every other, — at that concept which all comprehension and all extension must equally contain, but in which comprehension is at its minimum, extension at its maximum, — I mean the concept of *Being* or *Existence*.[1]

Definition and Division, — are the processes by which Comprehension and Extension of Concepts are resolved.

We have thus seen, that the maximum of comprehension and the minimum of extension are found in the concept of an individual, — that the maximum of extension and the minimum of comprehension are found in the concept of the absolutely simple, that is, in the concept of *existence*. Now, comprehension and extension, as quantities, are wholes; for wholes are only the complement of all their parts, and as wholes are only by us clearly comprehended as we distinctly comprehend their parts, it follows: — 1°, That comprehension and extension may each be analyzed into its parts; and, 2°, That this analysis will afford the mean by which each of these quantities can be clearly and distinctly understood. But as the two quantities are of an opposite nature, it is manifest, that the two processes of analysis will, likewise, be opposed. The analysis of the intensive or comprehensive quantity of concepts, that is, their depth, is accomplished by Definition; that of their extensive quantity, or breadth, by division. On Definition and Division I at present touch, not to consider them in themselves or on their own account, that is, as the methods of clear and of distinct thinking, for this will form the matter of a special discussion in the Second Part of Logic or Methodology, but simply in so far as it is requisite to speak of them in illustration of the general nature of our concepts.

Definition Illustrated.

The expository or explanatory analysis of a concept, considered as an intensive whole or quantum, if properly effected, is done by its resolution into two concepts of which it is proximately compounded, that is, into the higher concept under which it immediately stands, and into the concept which affords the character by which it is distinguished from the other coördinate concepts under that higher concept. This is its definition; that is, in logical language, its exposition by an analysis into its Genus and Differential Quality; — the genus being the higher concept, under which it stands; the differential quality the lower concept, by which it is distinguished from the other concepts subordinate to the genus, and on a level or coördinate with itself, and which, in logical language, are called *Species*. For example: if we attempt an expository or explanatory analysis of the concept *man*, considered an an intensive quantity or complexus of attributes, we analyze it into *animal*, this being the higher concept or genus, under which it stands; and into *rational*, the attribute of reason being the characteristic or differential quality by which *man* is distinguished from the other concepts or species which stand coördinated with itself, under the genus *animal*, — that is, *irrational animal or brute.*

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[1] This, like other logical relations, may be typified by a sensible figure. [See below, p. 108. — ED.]

Here you will observe, that though the analysis be of the comprehension, yet it is regulated by the extension; the extension regulating the order in which the comprehension is resolved into its parts.

Division.

The expository analysis of a concept, an extensive whole or quantum, is directly opposed to the preceding, to which it is correlative. It takes the higher concept, and, if conducted aright, resolves it into its proximately lower concepts, by adding attributes which afford their distinguishing characters or differences. This is division: — Thus, for example, taking the highest concept, that of *ens* or *existence*, by adding to it the differential concepts *per se* or *substantial*, and *non per se* or *accidental*, we have *substantial existence* or *existence per se*, equivalent to *substance*, and *accidental existence* or *existence non per se*, equivalent to *accident*. We may then divide substance by *simple* and *not-simple*, equivalent to *compound*, and again simple by *material* and *non-material*, equivalent to *immaterial*, equivalent to *spiritual;* — and matter or material substance by *organized* and *not-organized*, equivalent to *brute matter*. *Organized* matter we may divide by *sentient* or *animal*, and *non-sentient* or *vegetable*. *Animal* we may divide by *rational* and *irrational*, and so on, till we reach a concept which, as that of an individual object, is, in fact, not a general concept, but only in propriety a singular representation.

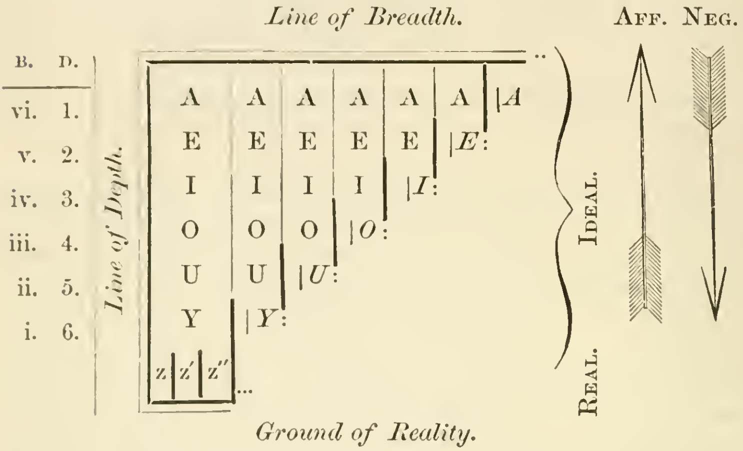
The Indefinable and Indivisible.

Thus, it is manifest, that, as Definition is the analysis of a complex concept into its component parts or attributes, if a concept be simple, that is, if it contain in it only a single attribute, it must be indefinable; and again, that as Division is the analysis of a higher or more general concept into others lower and less general, if a concept be an individual, that is, only a bundle of individual qualities, it is indivisible, is, in fact, not a proper or abstract concept at all, but only a concrete representation of Imagination.

**Diagram representing Extension and Comprehension of Concepts.**

The following Diagram[1] represents Breadth and Depth, with the relations of Affirmation and Negation to these quantities.

Schemes of the Two Quantities.



**Explanation.**

In the preceding Table there are represented: — by A, A, etc., the highest genus or widest attribute; by Y, the lowest species or narrowest attribute; whilst the other four horizontal series of vowels typify the subaltern genera and species, or the intermediate attributes. The *vowels* are reserved exclusively for classes, or common qualities; whereas the *consonants* z, z′, z″ (and which, to render the contrast more obtrusive, are not capitals) represent individuals, or singulars. Every higher class or more common attribute is supposed (in conformity with logical precision) to be dichotomized, — to be divided into two by a lower class or attribute, and its contradictory or negative. This contradictory, of which only the commencement appears, is marked by an italic vowel, preceded by a perpendicular line ( | ) signifying *not* or *non*, and analogous to the minus (—) of the mathematicians. This being understood, the table at once exhibits the *real* identity and *rational* differences of Breadth and Depth, which, though denominated *quantities*, are, in reality, one and the same quantity, viewed in counter relations and from opposite ends. Nothing is the one, which is not *pro tanto*, the other.

In *Breadth:* the supreme genus (A, A, etc.) is, as it appears, absolutely the greatest whole; an individual ($z$) absolutely the smallest part; whereas the intermediate classes are each of them a relative part or species, by reference to the class and classes above it; a relative whole or genus, by reference to the class or classes below it. In *Depth:* the individual is absolutely the greatest whole, the highest genus is absolutely the smallest part; whilst every relatively lower class or species, is relatively a greater whole than the class, classes, or genera, above it. The two quantities are thus, as the diagram represents, precisely the inverse of each other. The greater the Breadth, the less the Depth; the greater the Depth, the less the Breadth; and each, within itself, affording the correlative differences of whole and part, each, therefore, in opposite respects, *contains* and *is contained.* But, for distinction's sake, it is here convenient to employ a difference, not altogether arbitrary, of expression. We should say: — "containing and contained *under*," for Breadth; — "containing and contained *in*," for Depth. This distinction, which has been taken by some modern logicians, though unknown to many of them, was not observed by Aristotle. We find him (to say nothing of other ancient logicians) using the expression *ἐν ὅλῳ εἶναι* or *ὑπάρχειν*, for either whole. Though different in the order of thought, (*ratione*), the two quantities are identical in the nature of things, (*re*). Each supposes the other; and Breadth is not more to be distinguished from Depth, than the relations of the sides, from the relations of the angles, of a triangle. In effect it is precisely the same reasoning, whether we argue in Depth, — "$z'$ is (*i. e.* as subject, contains *in* it the inherent attribute) some Y; all Y is some U; all U is some O; all O is some I; all I is some E; all E is some A; — therefore, $z'$ is some A:" or whether we argue in Breadth, — "Some A is (*i. e.* as class, contains *under* it the subject part) all E; some E is all I; some I is all O; some O is all U; some U is all Y; some Y is $z'$; therefore, some A is $z'$." The two reasonings, internally identical, are externally the converse of each other; the premise and term, which in Breadth is major, in Depth is minor. In syllogisms also, where the contrast of the two quantities is abolished, there, with difference of figure, the differences of major and minor premise and term fall likewise. In truth, however, common language in its enouncement of propositions, is here perhaps more correct and philosophical than the technical language of logic itself. For as it is only an *equation* — only an *affirmation of identity* or *its negation*, which is, in either quantity, proposed; therefore the substantive verb (*is*, *is not*), used in both cases, speaks more accurately, than the expression, *contained* (or *not contained*), *in* of the one, *contained* (or *not contained*), *under* of the other. In fact, the

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[1] The Diagram and relative text to end of Lecture are extracted by the Editors from the Author's *Discussions*, p. 699—701. — Ed.

*two quantities* and the *two quantifications* have by logicians been neglected *together*.

This Table (the principle of which becomes more palpably demonstrative when the parts of the table are turned into the parts of a circular machine[1]) exhibits all the mutual relations of the counter quantities. — 1°, It represents the classes, as a series of resemblances thought as one (by a repetition of the same letter in the same series), but as really distinct (by separating lines). Thus, A is only A, not A, A, A, etc.; some Animal is not some Animal; one class of Animals is not all, every, or any other; this Animal is not that; Socrates is not Plato; z is not z′. On the other hand, E is E A; and Y is Y U O I E A; every lower and higher letter in the series coalescing uninterruptedly into a series of reciprocal subjects and predicates, as shown by the absence of all discriminating lines. Thus Socrates (z′) is Athenian (Y), Greek (U), European (O), Man (I), Mammal (E), Animal (A). Of course the series must be in grammatical and logical harmony. We must not collate notions abstract and notions concrete. — 2°, The Table shows the inverse correlation of the two quantities in respect of amount. For example: A (*i. e.* A, A, etc.), the highest genus represented as having six times the Breadth of Y; whilst Y (*i. e.* Y—A), the lowest species, has six times the Depth of A. — 3°, The table manifests all the classes, as in themselves unreal, subjective, ideal; for these are merely fictions or artifices of the mind, for the convenience of thinking. Universals only exist in nature, as they cease to be universal in thought; that is, they are reduced from general and abstract attributes to individual and concrete qualities. A—Y are only truly objective as distributed through z, z′, z″, etc.; and in that case they are not universals. As Boëthius expresses it: "Omne quod est, eo quod est, singulare est." — 4°, The opposition of class to class, through contradictory attributes, is distinguished by lines different from those marking the separation of one part of the same class from another. Thus, Animal, or Sentiently-organized (A), is contrasted with Not-animal, or Not-sentiently-organized ( | *A*), by lines thicker than those which merely discriminate one animal (A) from another (A).[2]

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[1] A machine of this kind was constructed by the Author, and used in the class-room to illustrate the doctrine of the text. — ED.

[2] See further in *Discussions*, p. 701 *et seq.* — ED.

# LECTURE IX.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### I.—ENNOEMATIC.

### B. OF CONCEPTS IN SPECIAL.—II. THEIR SUBJECTIVE RELATION—QUALITY.

Relation of Concepts to their subject.

Having concluded the consideration of the relation of concepts to their objects,—the relation in which their Quantity is given,—I now proceed to consider their relation to their conceiving subject—the relation in which is given their Quality. This consideration of the quality of concepts does not, in my opinion, belong to the Doctrine of Elements, and ought, in scientific rigor, to be adjourned altogether to the Methodology, as a virtue or perfection of thought. As logicians, however, have generally treated of it likewise under the former doctrine, I shall do so too, and commence with the following paragraph.

Par. XXVII The Quality of Concepts consists in its logical Perfection or Imperfection.

> ¶ XXVII. A concept or notion is the unity in consciousness of a certain plurality of attributes, and it, consequently, supposes the power of thinking these, both separately and together. But as there are many gradations in the consciousness with which the characters of a concept can be thought severally and in conjunction, there will consequently be many gradations in the actual Perfection or Imperfection of a notion. It is this perfection or imperfection which constitutes the logical Quality of a concept.[1]

It is thus the greater or smaller degree of consciousness which accompanies the concept and its object, that determines its quality, and according to which it is called logically perfect or logically imperfect. Now, there may be distinguished two degrees of this logical perfection, the nature of which is summarily expressed in the following paragraph.

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[1] Krug, *Logik*, § 30. Cf. Esser, *Logik*. § 45 *et seq.*—Ed.

Par. XXVIII. The two degrees of the logical Perfection and Imperfection of Concepts, — their Clearness and Distinctness, and their Obscurity and Indistinctness.

¶ XXVIII. There are two degrees of the logical perfection of concepts, — viz., their *Clearness* and their *Distinctness*, and, consequently, two opposite degrees of their corresponding imperfection, — viz., their *Obscurity* and their *Indistinctness*. These four qualities express the perfection and imperfection of concepts in extremes. But between these extremes there lie an indefinite number of intermediate degrees.

A concept is said to be *clear* (*clara*), when the degree of consciousness is such as enables us to distinguish it as a whole from others; and *obscure* (*obscura*), when the degree of consciousness is insufficient to accomplish this. A concept is said to be *distinct* (*distincta*, *perspicua*), when the degree of consciousness is such as enables us to discriminate from each other the several characters, or constituent parts of which the concept is the sum; and *indistinct* or *confused* (*indistincta*, *confusa*, *imperspicua*), when the amount of consciousness requisite for this is wanting. *Confused* (*confusa*), may be employed as the genus including *obscure* and *indistinct*.[1]

Original application of the expressions *clearness*, *obscurity*, etc.

Illustrated by reference to vision.

The expressions *clearness* and *obscurity*, and *distinctness* and *indistinctness*, as applied to concepts, originally denote certain modifications of vision; from vision they were analogically extended to the other senses, to imagination, and finally to thought. It may, therefore, enable us the better to comprehend their secondary application, to consider their primitive. To Leibnitz[2] we owe the precise distinction of concepts into clear and distinct, and from him I borrow the following illustration. In darkness — the complete obscurity of night — we see nothing, — there is no perception, — no discrimination of objects. As the light dawns, the obscurity diminishes, the deep and uniform sensation of darkness is modified, — we are conscious of a change, — we see something, but are still unable to distinguish its features, — we know not what it is. As the light increases, the outlines of wholes begin to appear, but still not with a distinctness sufficient to allow us to perceive them completely; but when this is rendered possible, by the rising intensity of the light, we are then said to see clearly. We then recognize mountains, plains, houses, trees, animals, etc., that is, we discriminate these objects as wholes, as unities, from each other. But their parts, — the manifold of which these unities are the sum, — their parts still lose themselves in each other, they are still but indistinctly visible. At length, when the daylight has fully sprung, we are enabled likewise to discriminate their parts; we now see distinctly what lies around us. But still we see as yet only the wholes which lie proximately around us, and of these only the parts which possess a certain size. The more distant wholes, and the smaller parts of nearer wholes, are still seen by us only in their conjoint result, only as they concur in making up that whole which is for us a visible minimum. Thus it is, that in the distant forest, or on the distant hill, we perceive a green surface; but we see not the several leaves, which in the one, nor the several blades of grass, which in the other, each contributes its effect to produce that amount of impression which our consciousness requires. Thus it is, that all which we do perceive is made up of parts which we do not perceive, and consciousness is itself a complement of impressions, which lie beyond its apprehension.[1] Clearness and distinctness are thus only relative. For between the extreme of obscurity and the extreme of distinctness, there are in vision an infinity of intermediate degrees. Now, the same thing occurs in thought. For we may either be conscious only of the concept in general, or we may also be conscious of its various constituent attributes, or both the concept and its parts may be lost in themselves to consciousness, and only recognized to exist by effects which indirectly evidence their existence.

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[1] Compare Krug, *Logik*, 31 *et seq.*—Ed. [illegible] *Logique*, 315 *et seq.* Kant, *Kr. d. r. Vernunf.* B. ii. [illegible] Dial., art. i., p. 414, 3d ed. 179[illegible].

[2] See his *Meditationes de Cognitione, Veritate et Ideis* (*Opera*, ed. Erdmann, p. 79), *Nouveaux Essais*, L. ii. ch. xxix. The illustration, however, does not occur in either of these passages. It was probably borrowed from Krug, *Logik*, § 31, and attributed to Leibnitz by an oversight.—Ed.

Clearness and obscurity as in concepts.

The perfection of a notion, as I said, is contained in two degrees or in two virtues, — viz., in its clearness and in its distinctness; and, of course, the opposite vices of obscurity and indistinctness afford two degrees or two vices, constituting its imperfection. "A concept is said to be *clear*, when the degree of consciousness by which it is accompanied is sufficient to discriminate what we think in and through it, from what we think in and through other notions;

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[1] See *Lectures on Metaphysics*, p. 241 *et seq.* — ED.

whereas if the degree of consciousness be so remiss that this and other concepts run into each other, in that case the notion is said to be *obscure*. It is evident that clearness and obscurity admit of various degrees; each being capable of almost infinite gradations, according as the object of the notion is discriminated with greater or less vivacity or precision from the objects of other notions. A concept is *absolutely clear*, when its object is distinguished from all other objects; a concept is *absolutely obscure*, when its object can be distinguished from no other object. But it is only the absolutely clear and the absolutely obscure which stand opposed as contradictory extremes; for the same notion can at once be relatively or comparatively clear, and relatively or comparatively obscure. Absolutely obscure notions, that is, concepts whose objects can be distinguished from nothing else, exist only in theory; — an absolutely obscure notion being, in fact, no notion at all. For it is of the very essence of a concept, that its object should, to a certain degree at least, be comprehended in its peculiar, consequently, in its distinguishing, characteristics. But, on the other hand, of notions absolutely clear, that is, notions whose objects cannot possibly be confounded with aught else, whether known or unknown, — of such notions a limited intelligence is possessed of very few, and, consequently, our human concepts are, properly, only a mixture of the opposite qualities; — *clear* or *obscure* as applied to them, meaning only that the one quality or the other is the preponderant. In a logical relation, the illustration of notions consists in the raising them from a preponderant obscurity to a preponderant clearness — or from a lower degree to a higher."[1] So much for the quality of clearness or obscurity considered in itself.

The absolutely clear and absolutely obscure.

The Distinctness and Indistinctness of Concepts

But a Clear concept may be either Distinct or Indistinct; the distinctness and indistinctness of concepts are therefore to be considered apart from their clearness and obscurity.

Historical notice of this distinction.

Due to Leibnitz

But before entering upon the nature of the distinction itself, I may observe that we owe the discrimination of Distinct and Indistinct from Clear and Obscure notions to the acuteness of the great Leibnitz. By the Cartesians the distinction had not been taken; though the authors of the *Port Royal Logic* come so near, that we may well marvel how they failed explicitly to enounce it.[2]

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[1] Esser, pp. 91, 92. [*Logik*, § 46 — Ed.]

[2] Part I. ch. ix. — For a comparison of this statement of the distinction with those of Descartes and Leibnitz, see the Appendix to Mr. Baynes's translation of the *Port Royal Logik*, p. 423 (second edition). — Ed

Locke.

Though Locke published his *Essay Concerning Human Understanding* some five years subsequent to the paper in which Leibnitz — then a very young man — had, among other valuable observations, promulgated this distinction, Locke did not advance beyond the limit already reached by the Cartesians; indeed, the praises that are so frequently lavished on this philosopher for his doctrine concerning the distinctions of Ideas, — the conditions of Definition, etc., — only prove that his encomiasts are ignorant of what had been done, and, in many respects, far better done, by Descartes and his school; — in fact, with regard to the Cartesian Philosophy in general, it must be confessed, that Locke has many errors to expiate, arising partly from oversight, and partly from the most unaccountable misapprehension of its doctrines. It is almost needless to say, that those who, in this country, have written on this subject, posterior to Locke, have not advanced a step beyond him; for though Leibnitz be often mentioned, and even occasionally quoted, by our British philosophers, I am aware of none who possessed a systematic acquaintance with his philosophy, and, I might almost say, who were even superficially versed either in his own writings or in those of any of the illustrious thinkers of his school.

The distinction in itself.

Illustrated by the analogy of Perception and Representation.

But to consider the distinction in itself. We have seen that a concept is clear, when we are able to recognize it as different from other concepts. But we may discriminate a whole from other wholes, we may discriminate a concept from other concepts, though we have only a confused knowledge of the parts of which that whole, or of the characters of which that concept, is made up. This may be illustrated by the analogy of our Perceptive and Representative Faculties. We are all acquainted with many, say a thousand, individuals; that is, we recognize such and such a countenance as the countenance of John, and as not the countenance of James, Thomas, Richard, or any of the other 999. This we do with a clear and certain knowledge. But the countenances, which we thus distinguish from each other, are, each of them, a complement made up of a great number of separate traits of features; and it might, at first view, be supposed that, as a whole is only the sum of its parts, a clear cognition of a whole countenance can only be realized through a distinct knowledge of each of its constituent features. But the slightest consideration will prove that this is not the case. For how few of us are able to say of any, the most familiar face, what are the particular traits which go to form the general result;

and yet, on that account, we hesitate neither in regard to our own knowledge of an individual, nor in regard to the knowledge possessed by others. Suppose a witness be adduced in a court of justice to prove the identity or non-identity of a certain individual with the perpetrator of a certain crime, the commission of which he had chanced to see, — would the counsel be allowed to invalidate the credibility of the witness by, first of all, requiring him to specify the various elements of which the total likeness of the accused was compounded, and then by showing that, as the witness either could not specify the several traits, or specified what did not agree with the features of the accused, he was, therefore, incompetent to prove the identity or non-identity required? This would not be allowed. For the court would hold that a man might have a clear perception and a clear representation of a face and figure, of which, however, he had not separately considered, and could not separately image to himself, the constituent elements. Thus, even the judicial determination of life and death supposes, as real, the difference between a clear and a distinct knowledge: for a distinct knowledge lies in the knowledge of the constituent parts; while a clear knowledge is only of the constituted whole.

The judicial determination between life and death supposes the difference between a clear and distinct knowledge

Further illustration from the human countenance.

Continuing our illustrations from the human countenance: we all have a clear knowledge of any face which we have seen, but few of us have distinct knowledge even of those with which we are familiar; but the painter, who, having looked upon a countenance, can retire and reproduce its likeness in detail, has necessarily both a clear and a distinct knowledge of it. Now, what is thus the case with perceptions and representations, is equally the case with notions. We may be able clearly to discriminate one concept from another, although the degree of consciousness does not enable us distinctly to discriminate the various component characters of either concept from each other. The Clearness and the Distinctness of a notion are thus not the same; the former involves merely the power of distinguishing the total objects of our notions from each other; the latter involves the power of distinguishing the several characters, the several attributes, of which that object is the sum. In the former the unity, in the latter the multiplicity, of the notion is called into relief.

The distinctness of a concept supposes, however, the Clearness; and may, therefore, be regarded as a higher degree of the same quality or perfection. "To the distinctness of a notion, over and above its general clearness, there are required three conditions, — 1°, The clear apprehension of its several characters or component parts; 2°, The clear contrast or discrimination of these; and, 3°, The clear recognition of the nexus by which the several parts are bound up into a unity or whole.

Special conditions of the Distinctness of a Concept, and of its degrees.

"As the clearness, so the distinctness, of a notion is susceptible of many degrees. A concept may be called *distinct*, when it involves the amount of consciousness required to discriminate from each other its principal characters; but it is so much the more distinct, 1°, In proportion to the greater number of the characters apprehended; 2°, In proportion to the greater clearness of their discrimination; and, 3°, In proportion to the precision with which the mode of their connection is recognized. But the greater distinctness is not exclusively or even principally determined by the greater number of the clearly apprehended characters; it depends still more on their superior importance. In particular, it is of moment whether the characters be positive or negative, internal or external, permanent or transitory, peculiar or common, essential or accidental, original or derived. From the mere consideration of the differences subsisting between attributes, there emerge three rules to be attended to in bestowing on a concept its requisite distinctness. In the first place, we should endeavor to discover the positive characters of the object conceived; as it is our purpose to know what the object is, and not what it is not. When, however, as is not unfrequently the case, it is not at once easy to discover what the positive attributes are, our endeavor should be first directed to the detection of the negative; and this not only because it is always an advance in knowledge, when we ascertain what an object is not, but, likewise, because the discovery of the negative characters conducts us frequently to a discovery of the positive.

"In the second place, among the positive qualities we should seek out the intrinsic and permanent before the extrinsic and transitory; for the former give us a purer and more determinate knowledge of an object, though this object may likewise, at the same time, present many external relations and mutable modifications. Among the permanent attributes, the proper or peculiar always merit a preference, if for no other reason, because through them, and not through the common qualities, can the proper or peculiar nature of the object become known to us.

"In the third place, among the permanent characters we ought first to hunt out the necessary or essential, and then to descend from them to the contingent or accidental; and this is not only because we thus give order and connection to our notions, but, likewise, because the contingent characters are frequently only to be comprehended through the necessary."[1]

The distinction of Clear and Distinct notions illustrated by concrete examples.

But before leaving this part of our subject, it may be proper to illustrate the distinction of Clear and Distinct notions by one or two concrete examples. Of many things we have clear but not distinct notions. Thus, we have a clear, but not a distinct, notion of colors, sounds, tastes, smells, etc. For we are fully able to distinguish red from white, to distinguish an acute from a grave note, the voice of a friend from that of a stranger, the scent of roses from that of onions, the flavor of sugar from that of vinegar; but by what plurality of separate and enunciable characters is this discrimination made? It is because we are unable to do this, that we cannot describe such perceptions and representations to others.

"If you ask of me," says St. Augustine, "what is Time, I know not; if you do not ask me, I know."[2] What does this mean? Simply that he had a clear, but not a distinct, notion of Time.

Of a triangle we have a clear notion, when we distinguish a triangle from other figures, without specially considering the characters which constitute it what it is. But when we think it as a portion of space bounded by three lines, as a figure whose three angles are equal to two right angles, etc., then we obtain of it a distinct concept.

How the Distinctness of a Concept is affected by the two quantities of a Concept.

We now come to the consideration of the question, — How does the Distinctness of a concept stand affected by the two quantities of a concept? — and in reference to this point I would, in the first place, dictate to you the following paragraph:

**Par. XXIX. Distinctness, Internal and External.**

> ¶ XXIX. As a concept is a plurality of characters bound up into unity, and as that plurality is contained partly in its Intensive, partly under its Extensive, quantity, its Distinctness is, in like manner, in relation to these quantities, partly an Internal or Intensive, partly an external or Extensive Distinctness.[3]

In explanation of this, it is to be observed, that, as the distinctness of a concept is contained in the clear apprehension of the various attributes of which it is the sum, as it is the sum of these attributes in two opposite relations, which constitute, in fact, two opposite quantities or wholes, and as these wholes are severally capable of illustration by analysis, it follows, that each of these analyses will contribute its peculiar share to the general distinctness of the concept. Thus, if the distinctness of a notion bears reference to that plurality which constitutes its comprehension, in other words, to that which is contained *in* the concept, the distinctness is denominated an *internal* or *intensive* distinctness, or distinctness of *comprehension*. On the other hand, if the distinctness refers to that plurality which constitutes the extension of the notion, in other words, to what is contained *under* it, in that case, the distinctness is called an *external* or *extensive* distinctness, a distinctness of *extension*. It is only when a notion combines in it both of these species of distinctness, it is only when its parts have been analyzed in reference to the two quantities, that it reaches the highest degree of distinctness and of perfection.

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[1] Esser, *Logik*, § 47, p 93-95. — Ed.

[2] *Confessions*, xi c. 14 — Ed.

[3] Krug, *Logik*, § 34; Esser, *Logik*, § 48.— Ed.

Explication.

The Internal Distinctness of a notion is accomplished by Exposition or Definition, that is, by the enumeration of the characters or partial notions contained in it: the External Distinctness, again, of a notion is accomplished through Division, that is, through the enumeration of the objects which are contained under it. Thus the concept *man* is rendered intensively more distinct, when we declare that man is a *rational animal;* it is rendered extensively more distinct, when we declare that man is partly *male*, partly *female man*.[1] In the former case, we resolve the concept man into its several characters, — into its partial or constituent attributes; in the latter, we resolve it into its subordinate concepts, or inferior genera. In simple notions, there is thus possible an extensive, but not an intensive, distinctness; in individual notions, there is possible an intensive, but not an extensive, distinctness.[2] Thus the concepts *existence*, *green*, *sweet*, etc., though, as absolutely or relatively simple, their comprehension cannot be analyzed into any constituent attributes, and they do not, therefore, admit of definition; still it cannot be said that they are incapable of being rendered more distinct. For do we not analyze the pluralities of which these concepts are the sum, when we say, that existence is either ideal or real, that green is a yellowish

Definition and Division

Simple notions admit of an extensive, individual notions of an intensive, distinctness.

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[1] Krug, p. 95, [*Logik*, § 34. — ED.]

[2] Esser, *Logik*, § 48. — ED.

or a bluish green, that sweet is a pungent or a mawkish sweet? — and do we not, by this analysis, attain a greater degree of logical perfection, than when we think them only clearly and as wholes?[1]

The highest point of Distinctness of a Concept.

"A concept, has, therefore, attained its highest point of distinctness, when there is such a consciousness of its characters that, in rendering its comprehension distinct, we touch on notions which, as simple, admit of no definition, and, in rendering its extension distinct, we touch on notions which, as individual, admit of no ulterior division. It is true, indeed, that a distinctness of this degree is one which is only ideal; that is, one to which we are always approximating, but which we never are able actually to reach. In order to approach as near as possible to this ideal, we must always inquire, what is contained in, and what under, a notion, and endeavor to obtain a distinct consciousness of it in both relations. What, in this research, first presents itself we must again analyze anew, with reference always both to comprehension and to extension; and descending from the higher to the lower, from the greater to the less, we ought to stop only when our process is arrested in the individual or in the simple."[2]

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[1] Krug, *Logik*, § 34, Anmerk., i. pp. 95, 96. — Ed.

[2] Esser, *Logik*, § 48, p. 96. — Ed.

# LECTURE X.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### I.—ENNOEMATIC.

### IMPERFECTION OF CONCEPTS.

Imperfection of Concepts.

It is now necessary to notice an Imperfection to which concepts are peculiarly liable, and in the exposition of which I find it necessary to employ an expression, which, though it has the highest philosophical authority for its use, I would still, in consequence of its ambiguity in English, have avoided, if this could have been done without compromising the knowledge of what it is intended to express. The expression I mean, is *intuitive*, in the particular signification in which it is used by Leibnitz,[1] and the continental philosophers in general,—to denote what is common to our direct and ostensive cognition of individual objects, in Sense or Imagination (Presentation or Representation), and in opposition to our indirect and symbolical cognition of general objects, through the use of signs or language, in the Understanding. But, on this head, I would, first of all, dictate to you the following paragraph.

Par. XXX. Imperfections of Concepts.

¶ XXX. As a notion or concept is the factitious whole or unity made up of a plurality of attributes,—a whole too often of a very complex multiplicity; and as this multiplicity is only mentally held together, inasmuch as the concept is fixed and ratified in a sign or word; it frequently happens, that, in its employment, the word does not suggest the whole amount of thought for which it is the adequate expression, but, on the contrary, we frequently give and take the sign, either with an obscure or indistinct consciousness of its meaning, or even without an actual consciousness of its signification at all.

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[1] *Meditationes de Cognitione, Veritate et Ideis, Opera*, ed. Erdmann, p. 80.—ED.

Illustration.

This liability to the vices of Obscurity and Indistinctness arises, 1°, From the very nature of a concept, which is the binding up of a multiplicity in unity; and 2°, From its dependence upon language, as the necessary condition of its existence and stability. In consequence of this, when a notion is of a very complex and heterogeneous composition, we are frequently wont to use the term by which it is denoted, without a clear or distinct consciousness of the various characters of which the notion is the sum; and thus it is, that we both give and take words without any, or, at least, without the adequate complement of thought. I may exemplify this: You are aware, that in countries where bank-notes have not superseded the use of the precious metals, large payments are made in bags of money, purporting to contain a certain number of a certain denomination of coin, or, at least, a certain amount in value. Now, these bags are often sealed up and passed from one person to another, without the tedious process, at each transference, of counting out their contents, and this upon the faith, that, if examined, they will be found actually to contain the number of pieces for which they are marked, and for which they pass current. In this state of matters, it is, however, evident, that many errors or frauds may be committed, and that a bag may be given and taken in payment for one sum, which contains another, or which, in fact, may not even contain any money at all. Now the case is similar in regard to notions. As the sealed bag or *rouleau* testifies to the enumerated sum, and gives unity to what would otherwise be an unconnected multitude of pieces, each only representing its separate value; so the sign or word proves and ratifies the existence of a concept, that is, it vouches the tying up of a certain number of attributes or characters in a single concept,— attributes which would otherwise exist to us only as a multitude of separate and unconnected representations of value. So far the analogy is manifest; but it is only general. The bag, the guaranteed sum, and the constituent coins, represent in a still more proximate manner the term, the concept, and the constituent characters. For in regard to each, we may do one of two things. On the one hand, we may test the bag, that is, open it, and ascertain the accuracy of its stated value, by counting out the pieces which it purports to contain; or we may accept and pass the bag, without such a critical enumeration. In the other case, we may test the general term, prove that it is valid for the amount and quality of thought of which it is the sign, by spreading out in consciousness the various characters of which the concept professes to be the complement; or we may take and give the term without such an evolution.[1]

It is evident from this, that notions or concepts are peculiarly liable to great vagueness and ambiguity, and that their symbols are liable to be passed about without the proper kind, or the adequate amount, of thought.

The liability to ambiguity and vagueness of concepts noticed by British philosophers.

This interesting subject has not escaped the observation of the philosophers of this country, and by them it has, in fact, with great ingenuity been illustrated; but as they are apparently ignorant that the matter had, before them, engaged the attention of sundry foreign philosophers, by whom it has been even more ably canvassed and expounded, I shall, in the exposition of this point, also do justice to the illustrious thinkers to whom is due the honor of having originally and most satisfactorily discussed it.

Stewart quoted on this subject.

The following passage from Mr. Stewart will afford the best foundation for my subsequent remarks: "In the last section I mentioned Dr. Campbell as an ingenious defender of the system of the Nominalists, and I alluded to a particular application which he has made of their doctrine. The reasonings which I had then in view, are to be found in the seventh chapter of the second book of his *Philosophy of Rhetoric*, in which chapter he proposes to explain how it happens, 'that nonsense so often escapes being detected both by the writer and the reader.' The title is somewhat ludicrous in a grave philosophical work, but the disquisition to which it is prefixed, contains many acute and profound remarks on the nature and power of signs, both as a medium of communication, and as an instrument of thought.

Refers to Hume.

"Dr. Campbell's speculations with respect to language as an instrument of thought, seem to have been suggested by the following passage in Mr. Hume's *Treatise of Human Nature*:[2] 'I believe every one who examines the situation of his mind in reasoning, will agree with me, that we do not annex distinct and complete ideas to every term we make use of; and that in talking of Government, Church, Negotiation, Conquest, we seldom spread out in our minds all the simple ideas of which these complex ones are composed. It is, however, observable, that notwithstanding this imperfection, we may avoid talking nonsense on these subjects, and may perceive any repugnance among the ideas, as well as if we had a full comprehension of them. Thus if, instead of saying, that in war the weaker have always recourse to negotiation, we should say, that they have always recourse to conquest; the custom which we have acquired, of attributing certain relations to ideas, still follows the words, and makes us immediately perceive the absurdity of that proposition.'

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[1] A hint of this illustration is to be found in Degerando, *Des Signes*, vol. i. chap. viii. p 200. — Ed.

[2] Part i. § 7. — Ed.

"In the remarks which Dr. Campbell has made on this passage, he has endeavored to explain in what manner our habits of thinking and speaking gradually establish in the mind such relations among the words we employ, as enable us to carry on processes of reasoning by means of them, without attending in every instance to their particular signification. With most of his remarks on this subject I perfectly agree; but the illustrations he gives of them are of too great extent to be introduced here, and I would not wish to run the risk of impairing their perspicuity by attempting to abridge them. I must, therefore, refer such of my readers as wish to prosecute the speculation, to his very ingenious and philosophical treatise.

And Campbell.

"'In consequence of these circumstances,' says Dr. Campbell, 'it happens that, in matters which are perfectly familiar to us, we are able to reason by means of words, without examining, in every instance, their signification. Almost all the possible applications of the terms (in other words, all the acquired relations of the signs) have become customary to us. The consequence is, that an unusual application of any term is instantly detected; this detection breeds doubt, and this doubt occasions an immediate recourse to ideas. The recourse of the mind, when in any degree puzzled with the signs, to the knowledge it has of the things signified, is natural, and on such subjects perfectly easy. And of this recourse the discovery of the meaning, or of the unmeaningness of what is said, is the immediate effect. But in matters that are by no means familiar, or are treated in an uncommon manner, and in such as are of an abstruse and intricate nature, the case is widely different.' The instances in which we are chiefly liable to be imposed on by words without meaning, are (according to Dr. Campbell) the three following:

"*First*, When there is an exuberance of metaphor.

"*Secondly*, When the terms most frequently occurring denote things which are of a complicated nature, and to which the mind is not sufficiently familiarized. Such are the words — Government, Church, State, Constitution, Polity, Power, Commerce, Legislature, Jurisdiction, Proportion, Symmetry, Elegance.

"*Thirdly*, When the terms employed are very abstract, and consequently of very extensive signification.

"'The more general any word is in its signification, it is the more liable to be abused by an improper or unmeaning application. A very general term is applicable alike to a multitude of different individuals, a particular term is applicable but to a few. When the rightful applications of a word are extremely numerous, they cannot all be so strongly fixed by habit, but that, for greater security, we must perpetually recur in our minds from the sign to the notion we have of the thing signified; and for the reason aforementioned, it is in such instances difficult precisely to ascertain this notion. Thus the latitude of a word, though different from its ambiguity, hath often a similar effect.'"[1]

Locke anticipated Hume in remarking the employment of terms without distinct meaning.

Now, on this I would, in the first place, observe, that the credit attributed to Hume by Dr. Campbell and Mr. Stewart, as having been the first by whom the observation had been made, is, even in relation to British philosophers, not correct. Hume has stated nothing which had not, with equal emphasis and an equal development, been previously stated by Locke, in four different places of his *Essay*.[2]

Thus, to take only one out of at least four passages directly to the same effect, and out of many in which the same is evidently maintained, he says, in the chapter entitled — *Of the Abuse of Words:*

Locke quoted.

"Others there be, who extend this abuse still farther, who take so little care to lay by words, which in their primary notation have scarce any clear and distinct ideas which they are annexed to, that by an unpardonable negligence they familiarly use words, which the propriety of language has fixed to very important ideas, without any distinct meaning at all. *Wisdom*, *glory*, *grace*, etc., are words frequent enough in every man's mouth; but if a great many of those who use them should be asked what they mean by them, they would be at a stand, and not know what to answer: a plain proof, that though they have learned those sounds, and have them ready at their tongue's end, yet there are no determined ideas laid up in their minds, which are to be expressed to others by them. Men having been accustomed from their cradles to learn words, which are easily got and retained, before they knew, or had framed the complex ideas to which they were annexed, or which were to be found in the things they were thought to stand for, they usually continue to do so all their lives; and without taking the pains necessary to settle in their minds determined ideas, they use their words for such unsteady and confused notions as they have, contenting themselves with the same words other people use: as if their very sound necessarily carried with it constantly the same meaning. This, though men make a shift with, in the ordinary occurrences of life, where they find it necessary to be understood, and therefore they make signs till they are so; yet this insignificancy in their words, when they come to reason concerning either their tenets or interest, manifestly fills their discourse with abundance of empty, unintelligible noise and jargon, especially in moral matters, where the words, for the most part, standing for arbitrary and numerous collections of ideas, not regularly and permanently united in nature, their bare sounds are often only thought on, or at least very obscure and uncertain notions annexed to them. Men take the words they find in use among their neighbors, and that they may not seem ignorant what they stand for, use them confidently, without much troubling their heads about a certain fixed meaning: whereby, besides the ease of it, they obtain this advantage, that as in such discourses they are seldom in the right, so they are as seldom to be convinced that they are in the wrong; it being all one to go about to draw those men out of their mistakes, who have no settled notions, as to dispossess a vagrant of his habitation who has no settled abode. This I guess to be so; and every one may observe in himself and others, whether it be or no."[1]

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[1] *Elements*, vol. i., *Works*, vol. ii. chap. iv. § 4, pp 193, 165.

[2] Compare *Essay*, B. II., ch. xxii , § 7; ii., xxix. 9; ii. xxxi. 8; iii. ix. 6; iii., x. 2 — ED

From a comparison of this passage with those I have given you from Stewart, Campbell, and Hume, it is manifest that, among British philosophers, Locke is entitled to the whole honor of the observation: for it could easily be shown, even from the identity of expression, that Hume must have borrowed it from Locke; and of Hume's doctrine the two other philosophers profess only to be expositors.

The distinction of Intuitive and Symbolical knowledge first taken by Leibnitz.

This curious and important observation was not, however, first made by any British philosopher; for Leibnitz had not only anticipated Locke, in a publication prior to the *Essay*, but afforded the most precise and universal explanation of the phænomenon, which has yet been given.

To him we owe the memorable distinction of our knowledge into Intuitive and Symbolical, in which distinction is involved the explanation of the phænomenon in question. It is the establishment of this distinction, likewise, which has superseded in Germany the whole controversy of Nominalism and Conceptualism, — which, in consequence of the non-establishment of this distinction, and the relative imperfection of our philosophical language, has idly agitated the Psychology of this country and of France.

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[1] *Essay concerning Human Understanding*, vol. ii. p. 228; [B. III., ch. x. §§ 3, 4. — ED.]

This distinction has superseded the controversy of Nominalism and Conceptualism in Germany.

Unacquaintance of the philosophers of this country with the doctrines of Leibnitz.

That the doctrines of Leibnitz, on this and other cardinal points of psychology, should have remained apparently unknown to every philosopher of this country, is a matter not less of wonder than of regret, and is only to be excused by the manner in which Leibnitz gave his writings to the world. His most valuable thoughts on the most important subjects were generally thrown out in short treatises or letters, and these, for a long time, were to be found only in partial collections, and sometimes to be laboriously sought out, dispersed as they were, in the various scientific Journals and Transactions of every country of Europe; and even when his works were at length collected, the attempt of his editor to arrange his papers according to their subjects (and what subject did Leibnitz not discuss?) was baffled by the multifarious nature of their contents. The most important of his philosophical writings — his *Essays* in refutation of Locke — were not merely a posthumous publication, but only published after the collected edition of his Works by Dutens; and this treatise, even after its publication, was so little known in Britain, that it remained absolutely unknown to Mr. Stewart — (the only British philosopher, by the way, who seems to have had any acquaintance with the works of Leibnitz) — until a very recent period of his life. The matter, however, with which we are at present engaged, was discussed by Leibnitz in one of his very earliest writings; and in a paper entitled *De Cognitione, Veritate, et Ideis*, published in the *Acta Eruditorum* of 1684, we have, in the compass of two quarto pages, all that has been advanced of principal importance in regard to the peculiarity of our cognitions by concept, and in regard to the dependence of our concepts upon language. In this paper, besides establishing the difference of Clear and Distinct knowledge, he enounces the memorable distinction of Intuitive and Symbolical knowledge, — a distinction not certainly unknown to the later philosophers of this country, but which, from their not possessing terms in which pre-

Manner in which he gave his writings to the world.

His paper, *De Cognitione, Veritate, et Ideis* cisely to embody it, has always remained vague and inapplicable to common use. Speaking of the analysis of complex notions, he says: "For the most part, however, especially in an analysis of any length, we do not view at once (non simul intuemur) the whole characters or attributes of the thing, but in place of these we employ signs, the explication of which into what they signify, we are wont, at the moment of actual thought, for the sake of brevity, to omit, knowing or believing that we have this explication always in our power. Thus, when I think a chiliogon (or polygon of a thousand equal sides), I do not always consider the various attributes, of the side, of the equality, and of the number a thousand, but use these words (whose meaning is obscurely and imperfectly presented to the mind) in lieu of notions which I have of them, because I remember, that I possess the signification of these words, though their application and explication I do not at present deem to be necessary: — this kind of thinking I am used to call *blind* or *symbolical*: we employ it in Algebra and in Arithmetic, but in fact universally. And certainly, when the notion is very complex, we cannot think at once all the ingredient notions: but where this is possible — at least, inasmuch as it is possible — I call the cognition *intuitive*. Of the primary elements of our notions, there is given no other knowledge than the intuitive: as of our composite notions, there is, for the most part, possible only a symbolical. From these considerations it is also evident, that of the things which we distinctly know we are not conscious of the ideas, except in so far as we employ an intuitive cognition. And, indeed, it happens that we often falsely believe that we have in our mind the ideas of things; erroneously supposing, that certain terms which we employ, had been applied and explicated; and it is not true, at least it is ambiguously expressed, what some assert, — that we cannot speak concerning anything, understanding what we say, without having an idea of it actually present. For we frequently apply any kind of meaning to the several words, or we merely recollect us, that we have formerly understood them, but because we are content with this blind thinking, and do not follow out the resolution of the notions, it happens, that contradictions are allowed to lie hid, which perchance the composite notion involves." . . . "Thus, at first sight, it must seem, that we could form an idea of a maximum velocity (motus celerrimi), for in using the terms we understand what we say; we shall find, however, that it is impossible, for the notion of a quickest motion is shown to be contradictory, and, therefore, inconceivable. Let us suppose, that a wheel is turned

Leibnitz quoted on Intuitive and Symbolical knowledge.

with a velocity absolutely at its maximum; every one perceives that if one of its spokes be produced, its outer end will be moved more rapidly than the nails in the circumference of the wheel; the motion, therefore, of these is not a maximum, which is contrary to the hypothesis, and, therefore, involves a contradiction."

Effect of this distinction by Leibnitz on the philosophy of Germany.

This quotation will suffice to show you how correctly Leibnitz apprehended the nature of concepts, as opposed to the presentations and representations of the subsidiary faculties; and the introduction of the term *Symbolical* knowledge, to designate the former, and the term *Intuitive* knowledge to comprehend the two latter, — terms which have ever since become classical in his own country, — has bestowed on the German language of philosophy, in this respect, a power and precision to which that of no other nation can lay claim. In consequence of this, while the philosophers of this country have been all along painfully expounding the phænomenon as one of the most recondite arcana of psychology, in Germany it has, for a century and a half, subsided into one of the elementary doctrines of the science of mind. It was in consequence of the establishment of this distinction by Leibnitz, that a peculiar expression (*Begriff*, *conceptus*) was appropriated to the symbolical notions of the Understanding, in contrast to the intuitive presentations of Sense and representations of Imagination, which last also were furnished with the distinctive appellations of *intuitions* (*Anschauungen*, *intuitus*). Thus it is, that, by a more copious and well-appointed language, philosophy has, in Germany, been raised above various controversies, which, merely in consequence of the poverty and vagueness of its English nomenclature, have idly occupied our speculations. But, to return to the mere logical question.

The distinction appreciated by the disciples of Leibnitz.

The doctrine of Leibnitz in regard to this natural imperfection of our concepts was not overlooked by his disciples, and I shall read you a passage from the Lesser Logic of Wolf, — a work above a century old, and which was respectably translated from German into English in the year 1770. This translation is now rarely to be met with, which may account for its being apparently totally unknown to our British philosophers; and yet, upon the whole, with all its faults and imperfections, it is perhaps the most valuable work on Logic (to say nothing of the *Port Royal Logic*) in the English language.

Wolf quoted. Words or terms, — what.

"By Words, we usually make known our thoughts to others: and thus they are nothing but uttered articulate signs of our thoughts for the information of others: for example, if one asks me what I am thinking of, and I answer, the sun; by this word I acquaint him what object my thoughts are then employed about.

"If two persons, therefore, are talking together, it is requisite, in order to be understood, first, that he who speaks, shall join some notion or meaning to each word; secondly, that he who hears, shall join the very same notion that the speaker does.

"Consequently, a certain notion or meaning must be connected with, and therefore something be signified by, each word.

"Now, in order to know whether we understand what we speak, or that our words are not mere empty sound, we ought, at every word we utter, to ask ourselves what notion or meaning we join therewith.

In speaking or thinking, the meaning of words not always attended to.

"For it is carefully to be observed, that we have not always the notion of the thing present to us, or in view, when we speak or think of it; but are satisfied when we imagine we sufficiently understand what we speak, if we think we recollect that we have had at another time the notion which is to be joined to this or the other word; and thus we represent to ourselves, as at a distance only, or obscurely, the thing denoted by the term (§ 9, c. i.).

How words without meaning may be understood.

"Hence it usually happens, that when we combine words together, to each of which apart a meaning or notion answers, we imagine we understand what we utter, though that which is denoted by such combined words be impossible, and, consequently, can have no meaning; for that which is impossible is nothing at all; and of nothing there can be no idea. For instance, we have a notion of gold, as also of iron: but it is impossible that iron can, at any time, be gold; consequently neither can we have any notion of iron-gold; and yet we understand what people mean when they mention *iron-gold*.

Further proved.

"In the instance alleged, it certainly strikes every one at first that the expression *iron-gold* is an empty sound; but yet there are a thousand instances in which it does not so easily strike: For example, when I say a rectilineal two-line figure, contained under two right-lines, I am equally well understood as when I say a right-lined triangle, a figure contained under three right-lines: and it should seem we had a distinct notion of both figures (§ 13, c. i.) However, as we show in geometry that two right-lines can never contain a space; it is also impossible to form a notion of a rectilineal two-lined figure; and, consequently, that expression is an empty sound. Just so it holds with the vegetable soul of plants, supposed to be a spiritual being, whereby plants are enabled to vegetate and grow: for though those words taken apart are intelligible, yet in their combination they have no manner of meaning. Just so if I say that the Attractive Spirit, or Attractive Cord, as Linus calls it, or the Attractive Force, as some philosophers at this day, is an immaterial principle superadded to matter, whereby the attractions in nature are performed; no notion or meaning can possibly be joined with these words. To this head also belong the Natural Sympathy and Antipathy of Plants; the Band of Right or law (*vinculum juris*), used in the definition of Obligation, by Civilians; the principle of Evil of the Manicheans," etc.[1]

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[1] *Logic, or Rational Thoughts on the Powers of the Human Understanding. Translated from the German of Baron Wolfius*, c. ii., p. 54—57; London, 1770.—Ed.

# LECTURE XI.

## STOICHEIOLOGY.

## SECTION I.—OF THE PRODUCTS OF THOUGHT.

### I. ENNOEMATIC.

### III. RECIPROCAL RELATIONS OF CONCEPTS.

### A. QUANTITY OF EXTENSION—SUBORDINATION AND COORDINATION.

I now proceed to the third and last Relation of Concepts, — that of concepts to each other. The two former relations of notions — to their objects and to their subject — gave their Quantity and Quality. This, the relation of notions to each other, gives what is emphatically and strictly denominated their *Relation.* In this rigorous signification, the Relation of Concepts may be thus defined.

Par. XXXI. Reciprocal Relations of Concepts.

¶ XXXI. The Relation proper of notions consists in those determinations or attributes which belong to them, not viewed as apart and in themselves, but as reciprocally compared. Concepts can only be compared together with reference, either, 1°, To their Extension; or, 2°, To their Comprehension. All their relations are, therefore, dependent on the one or on the other of these quantities.[1]

Par. XXXII. Under Extension.

¶ XXXII. As dependent upon Extension, concepts stand to each other in the five mutual relations, 1°, Of Exclusion; 2°, Of Coëxtension; 3°, Of Subordination; 4°, Of Coördination; and 5°, Of Intersection.

1. One concept excludes another, when no part of the one coincides with any part of the other. 2. One concept is coëx-

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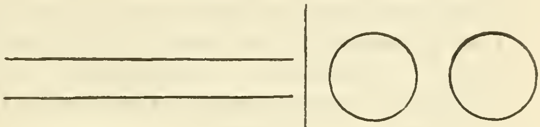
[1] Cf. Krug, *Logik*, § 36. — Ed.

[2] See diagram, p. 133.

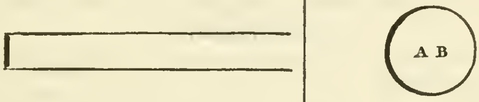
## CONCEPTS, THEIR RELATIONS PROPER:

TO WIT OF

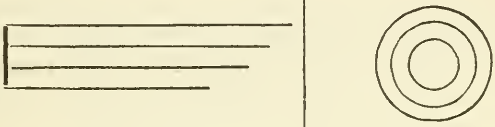
1 Exclusion[1]



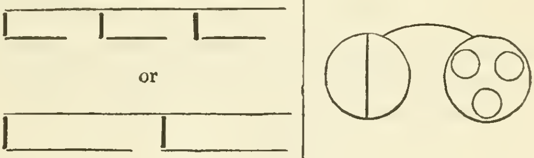
2. Coëxtension



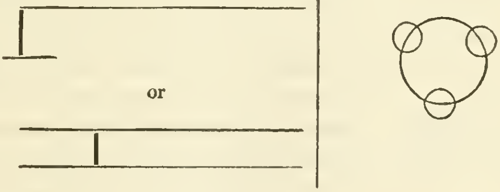
3. Subordination



4. Coördination



5. Intersection, or Partial Coïnclusion and Coëxclusion.



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[1] The notation by straight lines was first employed by the author in 1848.—Ed.

tensive with another, when each has the same number of subordinate concepts under it. 3. One concept is subordinate to another (which may be called the *Superordinate*) when the former is included within, or makes a part of, the sphere or extension of the latter. 4. Two or more concepts are coördinated, when each excludes the other from its sphere, but when both go immediately to make up the extension of a third concept, to which they are cosubordinate. 5. Concepts intersect each other, when the sphere of the one is partially contained in the sphere of the other.[1]

Of Exclusion, *horse*, *syllogism*, are examples: there is no absolute exclusion.

Examples of the five mutual relations of Concepts.

As examples of Coëxtension, — the concepts *living*, *being*, and *organized beings*, may be given. For, using the term *life* as applicable to plants as well as animals, there is nothing living which is not organized, and nothing organized which is not living. This reciprocal relation will be represented by two circles covering each other, or by two lines of equal length and in positive relation.

As examples of Subordination and Coördination, — *man*, *dog*, *horse*, stand, as correlatives, in subordination to the concept *animal*, and, as reciprocal correlatives, in coördination with each other.

What I would call the reciprocal relation of Intersection, takes place between concepts when their spheres cross or cut each other, that is, fall partly within, partly without, each other. Thus, the concept *black* and the concept *heavy* mutually intersect each other, for of these some black things are heavy, some not, and some heavy things are black, some not.

Subordination and Coördination of principal importance.

Of these relations, those of Subordination and Coördination are of principal importance, as on them reposes the whole system of classification; and to them alone it is, therefore, necessary to accord a more particular consideration.

Terms expressive of the different modes of the relation of Subordination.

Under the Subordination of notions, there are various terms to express the different modes of this relation; these it is necessary that you should now learn and hereafter bear in mind, for they form an essential part of the language of Logic, and will come frequently, in the sequel, to be employed in considering the analysis of Reasonings.

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[1] Cf Krug, *Logik*, § 41. — Ed.

Par. XXXIII. Superior and Inferior, Broader and Narrower notions.

¶ XXXIII. Of notions which stand to each other in the relations of Subordination, — the one is the *Higher* or *Superior* (*notio, conceptus, superior*), the other the *Lower* or *Inferior* (*notio, conceptus, inferior*). The superior notion is likewise called the *Wider* or *Broader* (*latior*), the inferior is likewise called the *Narrower* (*angustior*).[1]

Explication.

The meaning of these expressions is sufficiently manifest. A notion is called the *higher* or *superior*, inasmuch as it is viewed as standing over another in the relation of subordination, — as including it within its domain or sphere; and a correlative notion is called the *lower* or *inferior*, as thus standing under a superior. Again, the higher notion is called the *wider* or *broader*, as containing under it a greater number of things; the lower is called the *narrower*, as containing under it a smaller number.

Par. XXXIV. Universal and Particular notions.

¶ XXXIV. The higher or wider concept is also called, in contrast to the lower or narrower, a *Universal* or *General Notion* (*νόημα καθόλου*, *notio, conceptus, universalis, generalis*); the lower or narrower concept, in contrast to the higher or wider, a *Particular Notion*, *νόημα μερικόν*, *notio, conceptus particularis*.[2]

Explication.

The meaning of these expressions, likewise, requires no illustration. A notion is called *universal*, inasmuch as it is considered as binding up a multitude of parts or inferior concepts into the unity of a whole; for *universus* means *in unum versus* or *ad unum versus*, that is, *many turned into one*, or *many regarded as one*, and *universal* is employed to denote the attribution of this relation to objects. A notion is called *particular*, inasmuch as it is considered as one of the parts of a higher concept or whole.

¶ XXXV. A superior concept, inasmuch as it constitutes a common attribute or character for a number of inferior concepts, is called a *General Notion* (*νόημα καθόλου*, *notio conceptus generalis*), or, in a single word, a *Genus* (*γένος*, *genus*). A

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[1] Cf. Krug, *Logik*, § 42 — Ed.

[2] [See Ammonius, *In De Interpret.*, f 72 b, (Brandis, *Scholia in Aristot.*, p. 113); Facciolati, *Rudimenta Logica*, p 39.] [*Logica*, tom. i., P I., c iv. § 8, 4th edit, Venice, 1772. Cf. Krug, *Logik*, § 42. — Ed.]

Par. XXXV. Genus and Species.

notion, inasmuch as it is considered as at once affording a common attribution for a certain complement of inferior concepts or individual objects, and as itself an inferior concept, contained under a higher, is called a *Special Notion* (*νόημα εἰδικόν*, *notio, conceptus, specialis*), or, in a single word, a *Species* (*εἶδος*, *species*). The abstraction which carries up species into genera, is called, in that respect, *Generification*, or, more loosely, *Generalization.* The determination which divides a genus into its species is called, in that respect, *Specification.* Genera and Species are both called *Classes ;* and the arrangement of things under them is, therefore, *Classification.*[1]

Explication. The distinction of Genus and Species merely relative.

It is manifest that the distinction into Genera and Species is a merely relative distinction; as the same notion is, in one respect, a genus, in another respect, a species. For except a notion has no higher notion, that is, except it be itself the widest or most universal notion, it may always be regarded as subordinated to another; and, in so far as it is actually thus regarded, it is a species. Again, every notion except that which has under it only individuals, is, in so far as it is thus viewed, a genus. For example, the notion *triangle*, if viewed in relation to the notion of *rectilineal figure*, is a species, as is likewise *rectilineal figure* itself, as viewed in relation to *figure* simply. Again, the concept *triangle* is a genus, when viewed in reference to the concepts,— *right-angled triangle*, *acute-angled triangle*, etc. A right-angled triangle is, however, only a species, and not possibly a genus, if under it be necessarily included individuals alone. But, in point of fact, it is impossible to reach in theory any lowest species; for we can always conceive some difference by which any concept may be divided *ad infinitum.* This, however, as it is only a speculative curiosity, like the infinitesimal divisibility of matter, may be thrown out of view in relation to practice; and, therefore, the definition, by Porphyry and logicians in general, of the lowest species (of which I am immediately to speak), is practically correct, even though it cannot be vindicated against theoretical objections. On the other hand, we soon and easily reach the highest genus, which is given in *τὸ ὄν*, *ens aliquid*, *being*, *thing*, *something*, *etc.*, which are only various expressions of the same absolute universality. Out of these conditions there arise certain denominations of concepts, which it is, likewise, necessary that you be made aware of.

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[1] Krug, *Logik*, § 43. — ED.

Generification and Specification, — what.

In regard to the terms *Generification* and *Specification*, these are limited expressions for the processes of Abstraction and Determination, considered in a particular relation. Abstraction and Determination, you will recollect, we have already spoken of in general;[1] it will, therefore, be only necessary to say a very few words in reference to them, as the several operations by which out of species we evolve genera, and out of genera we evolve species. And first, in regard to Abstraction and Generification. In every complex notion, we can limit our attention to its constituent characters, to the exclusion of some one. We thus think away from this one, — we abstract from it. Now, the concept which remains, that is, the fasciculus of thought *minus* the one character which we have thrown out, is, in relation to the original, — the entire concept, the next higher, — the proximately superior notion. But a concept and a next higher concept are to each other as species and genus. The process of Abstraction, therefore, by which out of a proximately lower we evolve a proximately higher concept, is, when we speak with logical precision, called the process of *Generification.*

Generification.

Take, for example, the concept *man.* This concept is proximately composed of the two concepts or constituent characters, — *animal* and *rational being.* If we think either of these characters away from the other, we shall have in that other a proximately higher concept, to which the concept *man* stands in the relation of a species to its genus. If we abstract from *animal*, then *man* will stand as a species in subordination to the genus *rational being*, and the concept *animal* will then afford only a difference to distinguish *man* as a coördinate species from *immaterial intelligences.* If, on the other hand, we abstract from *rational being*, then *man* will stand as a species in subordination to the genus *animal*, having for a coördinate species *irrational animal.* Such is the process of Generification. Now for the converse process of Specification.

Specification.

Every series of concepts which has been obtained by abstraction, may be reproduced in an inverted order, when, descending from the highest notion, we, step by step, add on the several characters from which we had abstracted in our ascent. This process, as you remember, is called *Determination;* — a very appropriate expression, inasmuch as by each character or attribute which we add on, we limit or determine, more and more, the abstract vagueness or extension of the notion; until, at last, if every attribute be annexed, the sum of attributes contained in the notion becomes convertible with the sum of attributes of which some concrete individual or reality is the complement. Now, when we determine any notion by adding on a subordinate concept, we divide it; for the extension of the higher concepts is precisely equal to the extension of the added concept *plus* its negation. Thus, if to the concept *animal* we add on the next lower concept *rational*, we divide its extension into two halves, — the one equal to *rational animal* — the other equal to its negation, that is, to *irrational animal*. Thus an added concept and its negation always constitute the immediately lower notion, into which a higher notion is divided. But as a notion stands to the notions proximately subordinate to it, in the immediate relation of a genus to its species, the process of Determination, by which a concept is thus divided, is, in logical language, appropriately denominated *Specification*.

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[1] See above, p. 87 *et seq.* — ED.

So much in general for the Subordination of notions, considered as Genera and Species. There are, however, various gradations of this relation, and certain terms by which these are denoted, which it is requisite that you should learn and lay up in memory. The most important of these are comprehended in the following paragraph:

**Par XXXVI. Gradations of Genera and Species, and their designations.**

¶ XXXVI. A Genus is of two degrees, — a highest and a lower. In its highest degree, it is called the *Supreme* or *Most General Genus* (γένος γενικώτατον, *genus summum* or *generalissimum*), and is defined, "that which being a genus cannot become a species." In its lower degree, it is called a *Subaltern* or *Intermediate* (γένος ὑπάλληλον, *genus subalternum* or *medium*), and is defined, "that which being a genus can also become a species." A Species also is of two degrees, — a lowest and a higher. In its lowest degree, it is called a *Lowest* or *Most Special Species* (εἶδος εἰδικώτατον, *species infima*, *ultima*, or *specialissima*),[1] and is defined, "that which being a species cannot become a genus." In its higher degree, it is called a *Subaltern* or *Intermediate Species* (εἶδος ὑπάλληλον, *species subalterna media*), and is defined, "that which being a species may also become a genus." Thus a Subaltern Genus and a Subaltern Species are convertible.

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[1] Vide Timpler, p. 253, [*Logicæ Systema*, L. ii c. 1. q. 15. — Ed.]

Explication.

The distinctions and definitions in this paragraph are taken from the celebrated *Introduction*[1] of Porphyry to the *Categories* of Aristotle, and they have been generally adopted by logicians. It is evident, that the only absolute distinction here established, is that between the Highest or Supreme Genus and the Lowest Species; for the other classes — to wit, the Subaltern or Intermediate — are, all and each, either genera or species, according as we regard them in an ascending or a descending order, — the same concept being a genus, if considered as a whole containing under it inferior concepts as parts, and a species, if considered as itself the part of a higher concept or whole. The distinction of concepts into Genus and Species, into Supreme and Intermediate Genus, into Lowest and Intermediate Species, is all that Logic takes into account; because these are all the distinctions of degree that are given necessarily in the form of thought, and as abstracted from all determinate matter.

Categories of Aristotle.

It is, however, proper here to say a word in regard to the Categories or Predicaments of Aristotle. These are ten classes into which Existence is divided, — viz., 1, Substance; 2, Quantity; 3, Quality; 4, Relation; 5, Action; 6, Passion; 7, Where; 8, When; 9, Posture; and 10, Habit. (By this last is meant the relation of a containing to a contained.) They are comprehended in the two following verses:

> Arbor, sex servos, fervore, refrigerat ustos,
> Ruri cras stabo, nec tunicatus ero.[2]

Original meaning and employment of the term *category*.

In regard to the meaning of the word *category*, it is a term borrowed from the courts of law, in which it literally signifies an *accusation*. In a philosophical application, it has two meanings, or rather it is used in a general and in a restricted sense. In its general sense, it means, in closer conformity to its original application, simply a *predication* or *attribution;* in its restricted sense, it has been deflected to denote predications or attributions of a very lofty generality, in other words, certain classes of a very wide extension. I may here notice, that, in modern philosophy, it has been very arbitrarily, in fact very abusively, perverted from both its primary and its secondary signification among the ancients. Aristotle first employed the term (for the supposition that he bor-

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[1] C ii., §§ 23, 28, 29.

[2] Murmellii *Isagoge*, c. i. Vide Micrælius [*Lex. Phil. v. Prædicamenta* — Ed.] p. 1085. Facciolati, *Logica*, [t. i, *Rudimenta Logica*, P. I. c. iii. p. 32. — Ed.]

Kant's employment of the term.

*Transcendent* and *Transcendental*, — their original employment and use by Kant.

rowed his categories, name and thing, from the Pythagorean Archytas is now exploded — the treatise under the name of this philosopher being proved to be a comparatively recent forgery[1]), — I say, Aristotle first employed the term to denote a certain classification, *a posteriori*, of the modes of objective or real existence;[2] and the word was afterwards employed and applied in the same manner by Plotinus,[3] and other of the older philosophers. By Kant[4] again, and, in conformity to his example, by many other recent philosophers, the word has been usurped to denote the *a priori* cognitions, or fundamental forms of thought. Nor did Kant stop here; and I may explain to you the genealogy of another of his expressions, of which I see many of his German disciples are unaware. By the Schoolmen, whatever, as more general than the ten categories, could not be contained under them, was said to rise beyond them — to *transcend* them; and, accordingly, such terms as *being*, *one*, *whole*, *good*, etc., were called *transcendent* or *transcendental* (*transcendentia* or *transcendentalia*).[5] Kant, as he had twisted the term *category*, twisted also these correlative expressions from their original meaning. He did not even employ the two terms *transcendent* and *transcendental* as correlative. The latter he applied as a synonym for *a priori*, to denote those elements of thought which were native and necessary to the mind itself, and which, though not manifested out of experience, were still not contingently derived from it by an *a posteriori* process of generalization. The term *transcendent*, on the contrary, he applied to all pretended knowledge that transcended experience, and was not given in an original principle of the mind. *Transcendental* he thus applied in a favorable, *transcendent* in a condemnatory acceptation.[1] But to return from this digression.

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[1] See *Discussions*, p. 140. — ED.

[2] See especially *Metaph.*, iv. 7. In the treatise specially devoted to them, the Categories are viewed rather in a grammatical than in a metaphysical aspect. — ED.

[3] *Enn.* VI., l. i., c. i. — ED.

[4] *Kritik d. r. V.*, p. 78 (ed. Rosenkranz), *Prolegomena*, § 39. — ED.

[5] [See Facciolati, *Rud.*, p. 39; and *Inst.*, p. 26.] [*Logica*, t. i., *Rudimenta Logica*, P. I., c. iv., § 7. "Aliud est *categoricum*, quod significat certam quamdam rem categoria comprehensam: aliud *vagum*, quod nulla categoria continetur, sed per omnes vagatur, cujusmodi sunt *essentia*, *bonitas*, *ordo*, et similia multa." *Logica*, t. ii., *Institutiones Logicæ*, P. I., c. ii. "Sunt quædam vocabula, quæ *vaga* et *transcendentia* dicuntur: quod genus quodlibet exsuperent in omni categoria. Hujusmodi sunt *ens*, *aliquid*, *res*, *unum*, *verum*, *bonum*." Cf. *Reid's Works*, p. 687 note §. — ED.]

Excluded from the Aristotelic Categories, all except the following:

Ex parte vocis — "Vox una et simplex, rebus concinna locandis."
Ex parte rei — "Entia per sese, finita, realia, tota."

See others in Murmellius, *Isagoge*, c. 1.; Sanderson, p. 20, [Murmellius gives as his own the verses —

Complexum, Consignificans, Fictum, Polysemum,
Vox logicæ, Deus, Excedens, Privatio, Parsque,
Hæc, studiose, categoriis non accipiuntur.

And Sanderson (*Logica*, L. i. c. viii.), after citing the mnemonic of the Categories themselves, adds, "In aliqua istarum classium quicquid uspiam rerum est collocatur; modo sit *unum* quid, *reale*, *completum*, *limitatæque* ac *finitæ*, *naturæ*. Exulant ergo his sedibus *Intentiones Secundæ*, *Privationes*, et *Ficta*, quia non sunt realia; *Concreta*, *Equivoca*, et *Complexa*, quia non sunt una; *Pars*, quia non est completum quid; *Deus*, quia non est finitæ; *Transcendens*, quia non est limitatæ naturæ. Hinc versiculi:

Complexum, Consignificans, Privatio, Fictum,
Pars, Deus, Æquivocum, Transcendens, Ens rationis:
Sunt exclusa decem classibus ista novem."
— ED.]

[That the Categories of Aristotle are not applicable to God, see (Pseudo) Augustin, *De Cognitione Veræ Vitæ*, c. iii.]

Categories of Aristotle Metaphysical.

The *Categories* of Aristotle do not properly constitute a logical, but a metaphysical, treatise; and they are, accordingly, not overlooked in the Aristotelic books on the First Philosophy, which have obtained the name of *Metaphysics* (τὰ μετὰ τὰ φυσικά). Their insertion in the series of the surviving treatises of Aristotle on a logical argument, is, therefore, an error.[2]

Categories criticized as a classification of Being.

But, looking at these classes as the highest genera into which simple being is divided, they are, I think, obnoxious to various objections. Without pausing to show that in other respects they are imperfect, it is manifest that the supreme genus or category *Being* is not immediately divided into these ten classes, and that they neither constitute coördinate nor distinct species. For *Being* (τὸ ὄν, *ens*) is primarily divided into *Being by itself* (*ens per se*), and *Being by accident* (*ens per accidens*). *Being by itself* corresponds to the first Category of Aristotle, equivalent to substance; *Being by accident* comprehends the other nine, but is, I think, more properly divided in the following manner: — *Being by accident* is viewed either as absolute or as relative. As absolute, it flows either from the matter, or from the form of things. If from the matter, it is *Quantity*, Aristotle's second category; if from the form, it is *Quality*, Aristotle's third category. As relative, it corresponds to Aristotle's fourth category, *Relation*; and to Relation all the other six may be reduced. For the category *Where* is the relation of a thing to other things in space; the category *When* is the relation of a thing to other things in time. *Action* and *Passion* constitute a single relation, — the relation of the agent and the patient. *Posture* is the relation of the parts of the body to each other; finally, *Habit* is the relation of a thing containing and a thing contained. The little I have now said in regard to the categories of Aristotle is more, perhaps, than I was strictly warranted to say, considering them, as I do, as wholly extralogical, and I have merely referred to them as exhibiting an example of the application of the doctrine of classification.[1]

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[1] *Kritik d. r. V.*, p. 240, edit. Rosenkranz. — Ed.

[2] That the Categories of Aristotle are not logical but metaphysical, see C. Carleton; [Thomas Compton Carleton, *Philosophia, Universa, Disp. Met.* d. vi. § 1. — Ed.]

[3] With this classification of the Categories, compare Aquinas, *In Arist. Metaph.*, L. v. lect. 9. Suarez, *Disputationes Metaphysicæ.* Disp. 39, §§ 12, 15. — Ed.

Names for the different steps in the series of classes in the physical sciences of arrangement.

I may, likewise, notice, by the way, that in the physical sciences of arrangement, the best instances of which are seen in the different departments of Natural History, it is found necessary, in order to mark the relative place of each step in the ascending and descending series of classes, to bestow on it a particular designation. Thus *kingdom*, *class*, *order*, *tribe*, *family*, *genus*, *subgenus*, *species*, *subspecies*, *variety*, and the like, are terms that serve conveniently to mark out the various degrees of generalization, in its application to the descriptive sciences of nature. With such special applications and contingent differences, Logic has, however, no concern. I therefore proceed to the last relative denomination of concepts under the head of Subordination in Extension. It is expressed in the following paragraph:

**Par. XXXVII. Logical and Metaphysical Wholes and Parts.**

¶ XXXVII. A genus as containing under it species, or a species as containing under it individuals, is called a *Logical*, or *Universal*, or *Subject*, or *Subjective*, or *Potential Whole;* while species as contained under a genus, and individuals as contained under a species, are called *Logical*, or *Universal*, or *Subject*, or *Subjective*, or *Potential Parts*. *E con-*

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[1] There is nothing in regard to which a greater diversity of opinion has prevailed, even among Logicians, than the number of Categories. For some allow only two — Substance and Mode; others three — Substance, Mode, and Relation; others four — Mind, Space, Matter, and Motion; others seven which are comprehended in the following distich:

"*Mens*, *Mensura*, *Quies*, *Motus*, *Positura*, *Figura*,
*Crassaque Materies*, dederunt exordia rebus."

Second line better —

"Sunt cum *Materia*, cunctarum exordia rerum."

*Aristotle's Logic*, c. ii §§ 1, 2; *Reid's Account of Works*, p. 685 *et seq*. See Facciolati, *Logica*, t. i. *Rudimenta Logica*, P. I., c. iii. p. 32. Purchot, *Instit. Philos.*, t. i. *Logica*, p. 82, ed. 1716. Chauvin, *Lexicon Philosophicum*, *v. Categorema*. [For various attempts at reduction and classification of the categories, see Plotinus, *Ennead*. VI. L. ii., c. 8 *et seq*. (Tennemann, *Gesch. der Phil.*, vi., p. 175 *et seq*.) David the Armenian, in Brandis, *Scholia ad Aristot.*, p. 49. Ramus, *Animad. Aristot*. [L. iv., p. 80 *et seq.*, ed. 1550. Ed.] Jo. Picus Mirandulanus, *Conclusiones*, *Opera*, p. 90, ed. Basil, 1572; Laurentius Valla, [*Dialecticæ Disputationes*, cc. i. ii — Ed.] Eugenios, Λογικὴ p. 125 *et seq*. On categoric tables of various authors, see Denzinger, *Inst. Log.*, ii. § 606, p. 55. On history of categories in antiquity, see Petersen, *Chrysippeæ Phil. Fundamenta*, p. 1 *et seq*. For the doctrines of the Platonists and Stoics on the subject of the Categories, see Facciolati, *Inst. Log.*, [*Logica* t. ii., p. ii., p. 84 *et seq*. Cf. Trendelenburgh, *Geschichte der Kategorienlehre*, pp. 251, 267.— Ed.]

*verso*, — an individual as containing in it species, or a species as containing in it genera, is called a *Metaphysical* or *Formal* or *Actual Whole;* while species as contained in an individual, and genera as contained in species, are called *Metaphysical*, or *Formal*, or *Actual Parts*.[1] This nomenclature, however, in so far as metaphysical is opposed to logical, is inept; for we shall see that both those wholes and parts are equally logical, and that logicians have been at fault in considering one of them, in their doctrine of reasoning, to the exclusion of the other.

Explication.

A whole is that which contains parts; a part is that which is contained in a whole. But as the relation of a whole and parts is a relation dependent on the point of view from which the mind contemplates the objects of its knowledge, and as there are different points of view in which these may be considered, it follows that there may also be different wholes and parts. Philosophers have, accordingly, made various enumerations of wholes; and, without perplexing you with any minute discussion of their various divisions, it may be proper, in order to make you better aware of the two wholes with which Logic is conversant, — (and that there are two logical wholes, and consequently, two grand forms of reasoning, and not one alone, as all logicians have hitherto taught, I shall hereafter endeavor to convince you), — to this end, I say, it may be expedient to give you a general view of the various wholes into which the human mind may group up the objects of its speculation.

General view of the various possible Wholes.

Whole *per se*, and Whole *per accidens*.

Wholes may first be divided into two genera, — into a Whole by itself (*totum per se*), and a Whole by accident (*totum per accidens*). A Whole *per se* is that which the parts of their proper nature necessarily constitute; thus body and soul constitute the man. A Whole *per accidens* is that which the parts make up contingently; as when man is considered as made up of the poor and the rich. A Whole *per se* may, again, be subdivided into five kinds, into a Logical, a Metaphysical, a Physical, a Mathematical, and a Collective. 1°, A Logical, styled also a Universal, a Subject or Subjective, a Potential Whole; and, 2°, A Metaphysical, styled also a Formal or an Actual Whole, — these I have defined in the para-

Whole *per se* divided into, 1°, Logical; 2°, Metaphysical.

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[1] See Timpler, *Logica*, [p. 232 *et seq.*] Facciolati, [*Logica*, t. i., *Rudimenta Logica*, P. II., c. vi., p. 51, 52. — ED.] Derodon, p. 447 [*Logica Restituta*, P. III., c. ii., § 2. ed. Genevæ. 1668. — ED.] Burgersdyk, [*Institutiones Logicæ*, p. 51 — ED.]

graph. It is manifest that the logical and metaphysical wholes are the converse of each other. For as the logical whole is the genus, the logical parts the species and individual; in the metaphysical, *e contra*, an individual is the whole of which the species, a species the whole of which the genera, are the parts. A metaphysical whole is thus manifestly the whole determined by the comprehension of a concept, as a logical whole is that whole determined by its extension; and if it can be shown that the whole of comprehension affords the conditions of a process of reasoning equally valid, equally useful, equally easy, and, to say the least of it, equally natural, as that afforded by the whole of the extension, it must be allowed that it is equally well entitled to the name of a logical whole, as the whole which has hitherto exclusively obtained that denomination. 3°, A Physical, or, as it is likewise called, an Essential Whole, is that which consists of matter and of form, in other words, of substance and of accident, as its essential parts. 4°, A Mathematical, called likewise a Quantitative, an Integral, more properly an Integrate, Whole (*totum integratum*), is that which is composed of integral, or, more properly, of integrant parts (*partes integrantes*). In this whole every part lies out of every other part, whereas, in a physical whole, the matter and form, the substance and accident, permeate and modify each other. Thus, in the integrate whole of a human body, the head, body, and limbs, its integrant parts, are not contained in, but each lies out of, each other. 5°, A Collective, styled also a Whole of Aggregation, is that which has its material parts separate and accidentally thrown together, as an army, a heap of stones, a pile of wheat, etc.[1]

3°, Physical.

4°, Mathematical.

5°, Collective.

But to proceed now to an explanation of the terms in the paragraph last dictated. Of these, none seem to require any exposition, save the words *subjective* and *potential*, as synonyms applied to a Logical or Universal whole or parts.

The terms *subject* and *subjective* as applied to Logical whole and parts.

The former of these, — the term *subjective*, or more properly *subject*, as applied to the species as parts subjacent to, or lying under, a genus, — to the individuals, as parts subjacent to, or lying under, a species, is a clear and appropriate expression. But, as applied to genus or species, considered as wholes, the term *subject* is manifestly improper, and the term *subjective* hardly defensible. In like manner, the term *universal*, as applied to genus or species, considered as logical wholes, is correct; but as applied to individuals, considered as logical parts, it is used in opposition to its proper meaning. The desire, however, to obtain epithets common both to the parts and to the whole, and thus to indicate at once the relation in general, has caused logicians to violate the proprieties both of language and of thought. But as the terms have been long established, I think it sufficient to put you on your guard by this observation.

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[1] See above, p. 143, note. — Ed.

The term *potential*. Lord Monboddo quoted

In regard to the term *potential*, — I shall, before saying anything, read to you a passage from the *Antient Metaphysics* of the learned Lord Monboddo.[1] "In the first place, it is impossible, by the nature of things, that the genus should contain the species as a part of it, and the species should likewise contain the genus, in the same respect. But, in different respects, it is possible that each of them may contain the other, and be contained by it. We must, therefore, try to distinguish the different manners of containing, and being contained. And there is a distinction that runs through the whole of ancient philosophy, solving many difficulties that are otherwise unsurmountable, and which, I hope, will likewise solve this difficulty. The distinction I mean is the distinction betwixt what exists δυνάμει, or potentially only, and that which exists ἐνεργείᾳ, or actually. In the first sense, everything exists in its causes; and, in the other sense, nothing exists but what is actually produced. Now, in this first sense, the whole species exists in the genus; for the genus virtually contains the whole species, not only what actually exists of it, but what may exist of it in any future time. In the same manner, the lowest species, below which there is nothing but individuals, contains virtually all those individuals, present and future. Thus, the species *man* comprehends all the individuals now existing, or that shall hereafter exist; which, therefore, are said to be parts of the species *man*. On the other hand, the genus is actually contained in the species; and the species, likewise, in each of the individuals under it. Thus, the genus *animal* is actually contained in the species *man*, without which it could not be conceived to exist. And, for the same reason, the species *man* is actually contained in each individual. It is a piece of justice which I think I owe to an author, hardly known at all in the western parts of Europe, to acknowledge that I got the hint of the solution of this difficulty from him. The author I mean is a living Greek author, Eugenius Diaconus, at present Professor, as I am informed, in the

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[1] Vol. i. p. 479.

Patriarch's University at Constantinople, who has written an excellent system of logic in very good Attic Greek."

Stewart's strictures on this passage considered.

This, or rather a similar passage at p. 73 of the fourth volume of the *Antient Metaphysics*, affords Mr. Stewart an opportunity of making sundry unfavorable strictures on the technical language of Logic, in regard to which he asserts, "the adepts are not, to this day, unanimously agreed;" and adds, that "it is an extraordinary circumstance, that a discovery on which, in Lord Monboddo's opinion, *the whole truth of the syllogism depends*, should be of so very recent a date."[1] Now this is another example which may serve to put you on your guard against any confidence in the assertions and arguments even of learned men. You may be surprised to hear, that so far is Eugenius from being the author of this observation, and of the term *potential* as applied to a logical whole, that both are to be found, with few exceptions, in all the older systems of Logic. To quote only one, but one of the best and best known, that of Burgersdyck, — he says, speaking of the logical whole: "Et quia universale subjectas species et individua *non actu* continet sed potentia; factum est, ut hoc totum dictum sit *totum potentiale*, cum ceteræ species totius dicantur *totum actuale*, quia partes suas actu continent."[2] Aristotle notices this difference of the two wholes.[3]

Having thus terminated the consideration of concepts as reciprocally related in the perpendicular line of Subordination, and in the quantity of Extension, in so far as they are viewed as containing classes, — I must, before proceeding to consider them under this quantity in the horizontal line of Coördination, state to you two terms by which characters or concepts are denominated, in so far as they are viewed as differences by which a concept is divided into two subordinate parts.

Par. XXXVIII. Generic, Specific, and Individual Difference.

¶ XXXVIII. The character, or complement of characters, by which a lower genus or species is distinguished, both from the genus to which it is subordinate, and from the other genera or species with which it is coördinated, is called the *Generic* or the *Specific Difference* (διαφορὰ γενική, and διαφορὰ εἰδική, *differentia generica*, and *differentia specifica*). The sum of characters, again, by which a singular or individual

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[1] *Elements*, vol. ii., c. iii., § 1; *Works*, vol. iii., p. 199 and p. 200, note.

[2] Lib. I., c. xiv., p. 13, ed. 1650. — Ed.

[3] Vide Timpler, *Logica*, [L. II. c. i. *De Toto et Parte*. — Ed.]

> thing is discriminated from the species under which it stands and from other individual things along with which it stands, is called the *Individual* or *Singular* or *Numerical Difference* (*differentia individualis* vel *singularis* vel *numerica*).[1]

Explication

Generic and Specific Difference.

Two things are thus said to be generically different, inasmuch as they lie apart in two different genera; specifically different, inasmuch as they lie apart in two different species; individually or numerically different, inasmuch as they do not constitute one and the same reality. Thus *animal* and *stone* may be said to be generically different; *horse* and *ox* to be specifically different; *Highflyer* and *Eclipse* to be numerically or individually different. It is evident, however, that as all genera and species, except the highest of the one and the lowest of the other may be styled indifferently either genera or species, *generic difference* and *specific difference* are in general only various expressions of the same thing; and, accordingly, the terms *heterogeneous* and *homogeneous*, which apply properly only to the correlation of genera, are usually applied equally to the correlation of species.

Individual or Singular Difference.

"Individual existences can only be perfectly discriminated in Perception, external or internal, and their numerical differences are endless; for of all possible contradictory attributes the one or the other must, on the principles of Contradiction and Excluded Middle, be considered as belonging to each individual thing. On the other hand, species and genera may be perfectly discriminated by one or few characters. For example, *man*, is distinguished from every genus or species of animal by the one character of *rationality; triangle*, from every other class of mathematical figures, by the single character of *trilaterality*. It is, therefore, far easier adequately to describe a genus or species than an individual existence; as in the latter case, we must select, out of the infinite multitude of characters which an individual comprises, a few of the most prominent, or those by which the thing may most easily be recognized."[2] But as those which we thus select are only a few, and are only selected with reference to our faculty of apprehension and our capacity of memory, they always constitute only a petty, and often not the most essential part of the numerical differences by which the individuality of the object is determined.

Having now terminated the consideration of the Subordination of concepts under Extension, it is only necessary to observe that their Coördination under that quantity affords nothing which requires explanation, except what is contained in the following paragraph:

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[1] Krug, *Logik*, § 45. — ED.

[2] Krug, *Logik*, § 45, p. 134-5. — ED.

Par. XXXIX. Coördination of Concepts.

¶ XXXIX. Notions, in so far as they are considered the coördinate species of the same genus may be called *Conspecies;* and in so far as Conspecies are considered to be different but not contradictory, they are properly called *Discrete* or *Disjunct Notions* (*notiones discretæ* vel *disjunctæ*). The term *Disparate* (*notiones disparatæ*) is frequently applied to this opposition of notions, but less properly; for this ought to be reserved to denote the corresponding opposition of notions in the quantity of Comprehension.

I conclude the consideration of concepts, as dependent on Extension, by a statement of the two general laws, by which both Subordination and Coördination of notions, under this quantity, are regulated.

Par. XL. The two general laws by which Subordination and Coordination, under Extension, are regulated,—viz., of Homogeneity and Heterogeneity.

¶ XL. The whole classification of things by Genera and Species is governed by two laws. The one of these, the law of *Homogeneity* (*principium Homogeneitatis*), is,—That how different soever may be any two concepts, they both still stand subordinated under some higher concept; in other words, things the most dissimilar must, in certain respects, be similar. The other, the law of *Heterogeneity* (*principium Heterogeneitatis*), is,—That every concept contains other concepts under it; and, therefore, when divided proximately, we descend always to other concepts, but never to individuals; in other words, things the most homogeneous — similar — must, in certain respects, be heterogeneous — dissimilar.

Explication.
Generification and Specification.

Of these two laws, the former, as the principle which enables, and in fact compels, us to rise from species to genus, is that which determines the process of Generification; and the latter, as the principle which enables, and in fact compels, us to find always species under a genus, is that which regulates the process of Specification. The second of these laws, it is evident, is only true ideally, only true in theory. The infinite divisibility of concepts, like the infinite divisibility of space and time, exists only in speculation. And that it is theoretically valid, will be manifest, if we take two similar concepts, that is, two concepts with a small difference: let us then clearly represent to ourselves this difference, and we shall find that how small soever it may be, we can always conceive it still less, without being nothing, that is, we can divide it *ad infinitum;* but as each of these infinitesimally diverging differences affords always the condition of new species, it is evident that we can never end, that is, reach the individual, except *per saltum*.[1]

Law of Heterogeneity true only in theory.

There is another law, which Kant promulgates in the *Critique of Pure Reason*,[2] and which may be called the law of Logical Affinity, or the law of Logical Continuity. It is this, — That no two coördinate species touch so closely on each other, but that we can conceive other or others intermediate. Thus *man* and *orang-outang*, *elephant* and *rhinoceros*, are proximate species, but still how great is the difference between them, and how many species can we not imagine to ourselves as possibly interjacent?

Law of Logical Affinity.

This law I have, however, thrown out of account, as not universally true. For it breaks down when we apply it to mathematical classifications. Thus all angles are either acute or right or obtuse. For between these three coördinate species or genera no others can possibly be interjected, though we may always subdivide each of these, in various manners, into a multitude of lower species. This law is also not true when the coördinate species are distinguished by contradictory attributes. There can in these be no interjacent species, on the principle of Excluded Middle. For example: — in the Cuvierian classification the genus *animal* is divided into the two species of *vertebrata* and *invertebrata*, that is, into animals with a backbone — with a spinal marrow; and animals without a backbone — without a spinal marrow. Is it possible to conceive the possibility of any intermediate class?[3]

Grounds on which this law must be rejected.

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[1] Cf Krug *Logik*. § 45 p. 135, and pp. 136, 137. — ED

[2] P. 510. ed. Rosenkranz, Cf. Krug, *Logik*, p. 138. — ED.

[3] Bachmann, [*Logik*, § 61. pp. 102, 103. — ED ] [Compare Fries, *Logik*, § 21. — ED ]

# LECTURE XII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT.

### I.—ENNOEMATIC

### III. RECIPROCAL RELATIONS OF CONCEPTS.

### B. QUANTITY OF COMPREHENSION.

Reciprocal Relation of notions in Comprehension

Having now concluded the consideration of the Reciprocal Relation of Concepts as determined by the quantity of Extension, I proceed to treat of that relation as regulated by the counter quantity of Comprehension. On this take the following paragraph:—

Par. XLI. Identical and Different notions.

¶ XLI. When two or more concepts are compared together according to their Comprehension, they either coincide or they do not; that is, they either do or do not comprise the same characters. Notions are thus divided into *Identical* and *Different* (*conceptus identici et diversi*). The Identical are either absolutely or relatively the same. Of notions *Absolutely Identical* there are actually none; notions *Relatively Identical* are called, likewise, *Similar* or *Cognate* (*notiones similes, affines, cognatæ*); and if the common attributes, by which they are allied, be proximate and necessary, they are called *Reciprocating* or *Convertible* (*notiones reciprocæ, convertibiles*).[1]

In explanation of this paragraph, it is only necessary to say a word in regard to notions absolutely Identical. That such are

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[1] [Esser, *Logik*, § 36.]

Explication. Absolutely Identical notions impossible.

impossible, is manifest. "For, it being assumed that such exist, as absolutely identical, they necessarily have no differences by which they can be distinguished: but what are indiscernible can be known, neither as two concepts, nor as two identical concepts; because we are, *ex hypothesi*, unable to discriminate the one from the other. They are, therefore, to us as one. Notions absolutely identical can only be admitted, if, abstracting our view altogether from the concepts, we denominate those notions *identical*, which have reference to one and the same object, and which are conceived either by different minds, or by the same mind, but at different times. Their difference is, therefore, one not intrinsic and necessary, but only extrinsic and contingent. Taken in this sense, *Absolutely Identical* notions will be only a less correct expression for *Reciprocating* or *Convertible* notions."[1]

Par. XLII. Opposition of Concepts.

¶ XLII. Considered under their Comprehension, concepts, again, in relation to each other, are said to be either *Congruent* or *Agreeing*, inasmuch as they may be connected in thought; or *Conflictive*, inasmuch as they cannot. The confliction constitutes the *Opposition* of notions (τὸ ἀντικεῖσϑαι, *oppositio*). This is twofold; — 1°, *Immediate* or *Contradictory Opposition*, called likewise *Repugnance* (τὸ ἀντιφατικῶς ἀντικεῖσϑαι, ἀντίφασις, *oppositio immediata* sive *contradictoria*, *repugnantia*); and, 2°, *Mediate* or *Contrary Opposition* (τὸ ἐναντίως ἀντικεῖσϑαι. ἐναντιότης, *oppositio mediata* vel *contraria*). The former emerges when one concept abolishes (*tollit*), directly or by simple negation, what another establishes (*ponit*); the latter, when one concept does this not directly or by simple negation, but through the affirmation of something else.[2]

Explication. Identity and Agreement, Diversity and Confliction.

"Identity is not to be confounded with Agreement or Congruence, nor Diversity with Confliction. All identical concepts are, indeed, congruent; but all congruent notions are not identical. Thus *learning* and *virtue*, *beauty* and *riches*, *magnanimity* and *stature*, are congruent notions, inasmuch as, in thinking a thing, they can easily be combined in the notion we form of it, although in themselves very different from each other.

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[1] [Esser, *Logik*, § 36, p. 79.] Cf. Krug, *Logik*, § 37, and Anm. i. — Ed.

[2] Cf. Drobisch, *Logik*, p. 17, § 25 *seq.*

In like manner, all conflictive notions are diverse or different notions, for unless different, they could not be mutually conflictive; but on the other hand, all different concepts are not conflictive; but those only whose difference is so great that each involves the negation of the other: as, for example, *virtue* and *vice*, *beauty* and *deformity*, *wealth* and *poverty*. Thus these notions are by preëminence, — κατ' ἐξοχήν, — said to be *opposed*, although it is true that, in thinking, we can oppose, or place in antithesis, not only different, but even identical, concepts."

Contradictory and Contrary Opposition.

"To speak now of the distinction of Contradictory and Contrary Opposition, or of Contradiction and Contrariety; — of these the former — Contradiction — is exemplified in the opposites, — *yellow*, *not yellow*, *walking*, *not walking*. Here each notion is directly, immediately, and absolutely, repugnant to the other, — they are reciprocal negatives. This opposition is, therefore, properly called that of *Contradiction* or of *Repugnance*; and the opposing notions themselves are *contradictory* or *repugnant* notions, in a single word, *contradictories*. The latter, or Contrary Opposition, is exemplified in the opposites, *yellow*, *blue*, *red*, etc., *walking*, *standing*, *lying*, etc."

"In the case of Contradictory Opposition, there are only two conflictive attributes conceivable; and of these one or other must be predicated of the object thought. In the case of Contrary Opposition, on the other hand, more than two conflictive characters are possible, and it is not, therefore, necessary, that if one of these be not predicated of an object, any one other must. Thus, though I cannot at once sit and stand, and consequently *sitting* and *standing* are attributes each severally incompatible with the other; yet I may exist neither sitting nor standing, — I may lie; but I must either sit or not sit, I must either stand or not stand, etc. Such, in general, are the oppositions of Contradiction and Contrariety."

Logical significance of Contradictory and Contrary Opposition.

"It is now necessary to say a word in regard to their logical significance. Immediate or Contradictory Opposition constitutes, in Logic, affirmative and negative notions. By the former something is posited or affirmed (*ponitur*, *affirmatur*); by the latter, something is sublated or denied (*tollitur*, *negatur*). This, however, is only done potentially, in so far as concepts are viewed apart from judgments, for actual affirmation and actual negation suppose an act of judgment; but, at the same time, in so far as two concepts afford the elements, and, if brought into relation, necessitate the formation of an affirmative or negative proposition, they may be considered as in themselves negative and affirmative."

"Further, it is evident that a notion can only be logically denied by a contradiction. For when we abstract from the matter of a notion, as Logic does, it is impossible to know that one concept excludes another, unless the one be supposed the negation of the other. Logically considered, all positive or affirmative notions are congruent, that is, they can, as far as their form is concerned, be all conceived or thought together; but whether in reality they can coëxist — that cannot be decided by logical rules. If, therefore, we would, with logical precision and certainty, oppose things, we must oppose them not as contraries (*A B C*), but as contradictories (*A — not A B — not B C — not C*). Hence it also follows, that there is no negation conceivable without the concomitant conception of an affirmation; for we cannot deny a thing to exist, without having a notion of the existence which is denied."[1]

There are also certain other relations subsisting between notions, compared together in reference to their Comprehension.

**Par. XLIII. Intrinsic notions.**

> ¶ XLIII. Notions, as compared with each other in respect of their Comprehension, are further distinguished into *Intrinsic* and *Extrinsic*. The former are made up of those attributes which are essential, and, consequently, necessary to the object of the notion: these attributes, severally considered, are called *Essentials*, or *Internal Denominations* (*οὐσιώδη, essentialia, denominationes internæ, intrinsicæ*), and, conjunctly, the *Essence* (*οὐσία, essentia*). The latter, on the contrary, consist of those attributes which belong to the object of the notion only in a contingent manner, or by possibility; and which are, therefore, styled *Accidents*, or *Extrinsic Denominations* (*συμβεβηκότα, accidentia, denominationes externæ* or *extrinsicæ*).[2]

So much for the mutual relations of notions in reference to their Comprehension, when considered not in the relations of Involution and Coördination.

**Involution and Coördination of Concepts under Comprehension, — these wholly neglected by logicians.**

Having thus given you the distinctions of notions, as founded on their more general relations under the quantity of Comprehension, I now proceed to consider them under this quantity in their proximate relations; that is, in the relation of Involution and the relation of Coördination. These relations have been, I may say, altogether neglected by logicians; and, in consequence of this, they have necessarily overlooked one of the two great divisions of all reasoning; for all our reasoning is either from the whole to the parts and from the parts to the whole, in the quantity of extension, or from the whole to the parts and from the parts to the whole, in the quantity of comprehension. In each quantity there is a deductive, and in each quantity there is an inductive, inference; and if the reasoning under either of these two quantities were to be omitted, it ought, perhaps, to have been the one which the logicians have exclusively cultivated. For the quantity of extension is a creation of the mind itself, and only created through, as abstracted from, the quantity of comprehension; whereas the quantity of comprehension is at once given in the very nature of things. The former quantity is thus secondary and factitious, the latter primary and natural.

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[1] Krug, *Logik*, p. 118—120. — Ed.

[2] Krug, *Logik*, § 39. — Ed.

Hence reasoning in comprehension overlooked by logicians.

That logicians should have neglected the process of reasoning which is competent between the parts and whole of the quantity of comprehension, is the more remarkable, as, after Aristotle, they have in general articulately distinguished the two quantities from each other, and, after Aristotle, many of them have explicitly enounced the special law on which the logic of comprehension proceeds. This principle established, but not applied, is expressed in the axiom — The character of the character is the character of the thing; or, The predicate of the predicate is the predicate of the subject (*Nota notæ est nota rei ipsius; Prædicatum prædicati est prædicatum subjecti*). This axiom is enounced by Aristotle;[1] and its application, I have little doubt, was fully understood by him. In fact, I think it even possible to show in detail that his whole analysis of the syllogism has reference to both quantities, and that the great abstruseness of his *Prior Analytics*, the treatise in which he develops the general forms of reasoning, arises from this, — that he has endeavored to rise to formulæ sufficiently general to express at once what was common to both kinds; — an attempt so far beyond the intelligence of subsequent logicians, that they have wholly misunderstood and perverted his doctrine. They understand this doctrine, only as applied to the reasoning in extensive quantity; and in relation to this kind of reasoning, they have certainly made palpable and easy what in Aristotle is abstract and difficult. But then they did not observe that Aristotle's doctrine applies to two species, of which they only consider one. It was certainly proper to bring

But probably contemplated by Aristotle.

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[1] *Categ.*, c. iii. — Ed.

down the Aristotelic logic from its high abstraction, and to deliver its rules in proximate application to each of the two several species of reasoning. This would have been to fill up the picture of which the Stagirite had given the sketch. But by viewing the analytic as exclusively relative to the reasoning in extension, though they simplified the one-half of syllogistic, they altogether abolished the other. This mistake — this partial conception of the science — is common to all logicians, ancient and modern; for in so far as I am aware, no one has observed, that of the quantities of comprehension and extension, each affords a reasoning proper to itself; and no one has noticed that the doctrine of Aristotle has reference indifferently to both; although some, I know, having perceived in general that we do reason under the quantity of comprehension, have on that founded an objection to all reasoning under the quantity of extension, that is, to the whole science of Logic as at present constituted. I have, in some degree, at present spoken of matters which properly find their development in the sequel; and I have made this anticipation, in order that you should attend particularly to the relation of concepts, under the quantity of comprehension, as containing and contained, inasmuch as this affords the foundation of one, and that not the least important, of the two great branches, into which all reasoning is divided.

**Par. XLIV. Involution and Coördination.**

¶ XLIV. We have seen that of the two quantities of notions each affords a logical Whole and Parts; and that, by opposite errors, the one of these has, through over inclusion, been called the *logical;* whilst the other has, through over exclusion, been called the *metaphysical.* Thus, in respect of their Comprehension, no less than of their Extension, notions stand to each other in a relation of Containing and Contained; and this relation, which, in the one quantity (extension) is styled that of *Subordination*, may in the other (comprehension), for distinction's sake, be styled that of *Involution. Coördination* is a term which may be applied in either quantity.[1]

In the quantity of comprehension, one notion is involved in another, when it forms a part of the sum total of characters, which together constitute the comprehension of that other; and two notions are in this quantity coördinated, when, whilst neither comprehends the other, both are immediately comprehended in the same lower concept.

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[1] [Cf. Drobisch, *Logik*, §§ 22, 23. Fischer, *Logik*, § 49.]

Explication.

From what has been formerly stated, you are aware that the quantity of comprehension, belonging to a notion, is the complement of characters which it contains in it; and that this quantity is at its maximum in an individual. Thus the notion of the individual *Socrates*, contains in it, besides a multitude of others, the characters of *Son of Sophroniscus*, *Athenian*, *Greek*, *European*, *man*, *animal*, *organized being*, *etc.* But these notions, these characters, are not all equally proximate and immediate; some are only given in and through others. Thus the character *Athenian* is applicable to Socrates only in and through that of *Son of Sophroniscus*, — the character of *Greek*, only in and through that of *Athenian*, — the character of *European*, only in and through that of *Greek*, — and so forth; in other words, Socrates is an Athenian only as the son of Sophroniscus, only a Greek as an Athenian, only a European as a Greek, only a man as a European, only an animal as a man, only an organized being as an animal. Those characters, therefore, that are given in and through others, stand to these others in the relation of parts to wholes; and it is only on the principle — Part of the part is a part of the whole, that the remoter parts are the parts of the primary whole. Thus, if we know that the individual *Socrates* comprehends the character *son of Sophroniscus*, and that the character *son of Sophroniscus* comprehends the character *Athenian;* we are then warranted in saying that *Socrates* comprehends *Athenian*, in other words, that *Socrates* is an *Athenian*. The example here taken is too simple to show in what manner our notions are originally evolved out of the more complex into the more simple, and that the progress of science is nothing more than a progressive unfolding into distinct consciousness of the various elements comprehended in the characters, originally known to us in their vague or confused totality.

Controversy regarding the *Primum Cognitum.*

It is a famous question among philosophers, — Whether our knowledge commences with the general or with the individual, — whether children first employ common, or first employ proper, names. In this controversy, the reasoners have severally proved the opposite opinion to be untenable; but the question is at once solved by showing that a third opinion is the true, — viz., that our knowledge commences with the confused and complex, which, as regarded in one point of view or another, may easily be mistaken either for the individual, or for the general. The discussion of this problem belongs, however, to Psychology, not to Logic.[1] It is sufficient to say in general, that all objects are presented to us in complexity; that we are at first more struck with the points of resemblance than with the points of contrast; that the earliest notions, and, consequently, the earliest terms, are those that correspond to this synthesis, while the notions and the terms arising from an analysis of this synthesis into its parts, are of a subsequent formation. But though it be foreign to the province of Logic to develop the history of this procedure; yet, as this procedure is natural to the human mind, Logic must contain the form by which it is regulated. It must not only enable us to reason from the simple and general to the complex and individual; it must, likewise, enable us to reverse the process, and to reason from the complex and individual to the simple and the general. And this it does by that relation of notions as containing and contained, given in the quantity of comprehension. The nature of this reasoning can indeed only be shown, when we come to treat of syllogism; at present, I only request that you will bear in mind the relations of Involution and Coördination, in which notions stand to each other in the whole or quantity of comprehension. In this quantity the involving notion or whole is the more complex notion; the involved notion or part is the more simple. Thus *pigeon* as comprehending *bird*, *bird* as comprehending *feathered*, *feathered* as comprehending *warm-blooded*, *warm-blooded* as comprehending *heart with four cavities*, *heart with four cavities* as comprehending *breathing with lungs*, are severally to each other as notions involving and involved. Again, notions, in the whole of comprehension, are coördinated when they stand together as constituting parts of the notion in which they are both immediately comprehended. Thus the characters *oviparous* and *warm-blooded*, *heart with four cavities*, and *breathing by lungs*, as all immediately contributing to make up the comprehension of the notion *bird*, are, in this respect, severally considered as its coördinate parts. These characters are not relative and correlative — not containing and contained. For we have oviparous animals which are not warm-blooded, and warm-blooded animals which are not oviparous. Again, it is true, I believe, that all warm-blooded animals have hearts with four cavities (two auricles and two ventricles), and that all animals with such hearts breathe by lungs and not by gills. But then, in this case, we have no right to suppose that the first of these characters comprehends the second, and that the second comprehends the third. For we should be equally entitled to assert, that all animals breathing by lungs possessed hearts of four

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[1] See *Lectures on Metaphysics*, l. xxxvi., p. 493 *seq.* — ED.

In Comprehension, the involving notion is the more complex; the involved, the more simple.

Coördination in Comprehension.

cavities, and that all animals with such hearts are warm-blooded. They are thus thought as mutually the conditions of each other; and whilst we may not know their reciprocal dependence, they are, however, conceived by us, as on an equal footing of coördination. (This at least is true of the two attributes *heart with four cavities* and *breathing by lungs;* for these must be viewed as coördinate; but, taken together, they may be viewed as jointly necessitating the attribute of *warm-blooded*, and, therefore, may be viewed as comprehending it.) On this I give you the following paragraph.

**Par. XLV. Coördination of notions in Comprehension.**

¶ XLV. Notions coördinated in the whole of comprehension, are, in respect of the discriminating characters, different without any similarity. They are thus, *pro tanto*, absolutely different; and, accordingly, in propriety are called *Disparate Notions* (*notiones disparatæ*). On the other hand, notions coördinated in the quantity or whole of extension, are, in reference to the objects by them discriminated, different (or diverse); but, as we have seen, they have always a common attribute or attributes in which they are alike. Thus they are only relatively different (or diverse); and, in logical language, are properly called *Disjunct* or *Discrete Notions* (*notiones, disjunctæ, discretæ*).[1]

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[1] [Drobisch, *Logik*, §§ 23, 24. Cf. Fischer, *Logik*, § 49 *et seq.*]

# LECTURE XIII. —4

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT.

### II.—APOPHANTIC, OR THE DOCTRINE OF JUDGMENTS.

### JUDGMENTS.—THEIR NATURE AND DIVISIONS.

Doctrine of Judgments.

Having terminated the Doctrine of Concepts, we now proceed to the Doctrine of Judgments. Concepts and Judgments, as I originally stated, are not to be viewed as the results of different operations, for every concept, as the product of some preceding act of Comparison, is in fact a judgment fixed and ratified in a sign. But in consequence of this acquired permanence, concepts afford the great means for all subsequent comparisons and judgments, and as this now forms their principal relation, it behoved, for convenience, throwing out of view their original genealogy, to consider Notions as the first product of the Understanding, and as the conditions or elements of the second. A concept may be viewed as an implicit or undeveloped judgment; a judgment as an explicit or developed concept. But we must now descend to articulate statements.

Par. XLVI. Judgment,—what.

¶ XLVI. To Judge (κρίνειν,[1] *judicare*) is to recognize the relation of congruence or of confliction, in which two concepts, two individual things, or a concept and an individual, compared together, stand to each other. This recognition, considered as an internal consciousness, is called a *Judgment* (λόγος ἀποφαντικός, *judicium*); considered as expressed in language, it is called a *Proposition* or *Predication* (ἀπόφαντις, πρότασις,[2] διάστημα,

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[1] The verb κρίνειν, *to judge*, and still more the substantive, κρίσις, *judgment*, are rarely used by the Greeks—(never by Aristotle)—as technical terms of Logic or Psychology.

[2] [Aristotle uses the term πρότασις merely for the premise of a syllogism, especially the major (he has no other word for premise); whereas ἀπόφαντις he employs always for an

*propositio, prædicatio, pronunciatum, enunciatio, effatum, profatum, axioma*).[1]

Explication, — what is implied in Judgment

As a judgment supposes a relation, it necessarily implies a plurality of thoughts, but conversely a plurality of thoughts does not necessarily imply a judgment. The thoughts whose succession is determined by the mere laws of Association, are, though manifested in plurality, in relation, and, consequently, in connection, not, however, so related and so connected as to constitute a judgment. The thoughts *water*, *iron*, and *rusting*, may follow each other in the mental train; they may even be viewed together in a simultaneous act of consciousness, and this without our considering them in an act of Comparison, and without, therefore, conjoining or disjoining them in an act of judgment. But when two or more thoughts are given in consciousness, there is in general an endeavor on our part to discover in them, and to develop a relation of congruence or of confliction; that is, we endeavor to find out whether these thoughts will or will not coincide — may or may not be blended into one. If they coincide, we judge, we enounce, their congruence or compatibility; if they do not coincide, we judge, we enounce, their confliction or incompatibility. Thus, if we compare the thoughts — *water*, *iron*, and *rusting*, — find them congruent, and connect them into a single thought, thus — *water rusts iron*, — in that case we form a Judgment.[2]

Condition under which notions are considered congruent.

But if two notions be judged congruent, in other words, be conceived as one, this their unity can only be realized in consciousness, inasmuch as one of these notions is viewed as an attribute or determination of the other. For, on the one hand, it is impossible for us to think as one, two attributes, that is, two things viewed as determining, and yet neither determining or qualifying the other; nor, on the other hand, two subjects, that is, two things thought as determined, and yet neither of them determined or qualified by the other. For example, we cannot think the two attributes *electrical* and *polar* as a single notion, unless we convert the one of these attributes into a subject to be determined or qualified by the other: but if we do, — if we say, *what is electrical is polar*, we at once reduce the duality to unity, — we judge that *polar* is one of

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enunciation considered not as merely syllogistic. See Ammonius, *In De Interpret.*, f. 4 a. Gr p. 4 Lat. Facciolati. *Rudimenta Logica*, P. II. c. i p. 59. Waitz, *Commentarius in Organon*, I. p. 368. *Organon Pacii*, pp. 92, 127, 240 *et seq.*, 416, 417.]

[1] By Stoics and Ramists.

[2] Cf. Krug, *Logik*, § 61. Anm. i. p. 149, 150.

the constituent characters of the notion *electrical*, or that what is *electrical* is contained under the class of things marked out by the common character of *polarity*. In like manner, we cannot think the two subjects *iron* and *mineral* as a single notion, unless we convert the one of the subjects into an attribute by which the other is determined or qualified; but if we do,—if we say, *iron is a mineral*, we again reduce the duality to unity; we judge that one of the attributes of the subject *iron* is, that it is a *mineral*, or that *iron* is contained under the class of things marked out by the common character of *mineral*.

A judgment must contain three notions.

From what has now been said, it is evident that a judgment must contain and express three notions, which, however, as mutually relative, constitute an indivisible act of thought. It must contain, 1°, The notion of something to be determined; 2°, The notion of something by which another is determined; and, 3°, A notion of the relation of determination between the two. This will prepare you to understand the following paragraph.

Par. XLVII. Subject, Predicate, and Copula.

¶ XLVII. That which, in the act of Judging, we think as the determined or qualified notion, is technically called the *Subject* (ὑποκείμενον, *subjectum*); that which we think as the determining or qualifying notion, the *Predicate* (κατηγορούμενον, *prædicatum*); and the relation of determination, recognized as subsisting between the subject and the predicate, is called the *Copula*. By Aristotle, the predicate includes the copula;[1] and, from a hint by him, the latter has, by subsequent Greek logicians, been styled the *Appredicate* (προσκατηγορούμενον, *apprædicatum*).[2] The Subject and Predicate of a proposition are, after Aristotle, together called its *Terms* or *Extremes*[3] (ὅροι ἄκρα πέρατα, *termini*); as a proposition is by him sometimes called an *Interval* (διάστημα),[4] being, as it were, a line stretched out between the extremes or terms. We may, therefore, articulately define a judgment or proposition to be the product of that act in which we pronounce, that, of two notions thought as subject and as predicate, the one does or does not constitute a part of the other, either in the quantity of Extension, or in the quantity of Comprehension.

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[1] See *De Interp.*, c. 3. where the ῥῆμα, or verb, includes the predicate and copula united. — ED.

[2] See *De Interpretatione*, c. 10, § 4. Ὅταν δὲ τὸ ἔστι τρίτον πρυσκατηγορῆται, — an expression to which may be traced the scholastic distinction between *secundi* and *tertii adjacentis*. For the term προσκατηγορούμενον to denote the predicate of a proposition, see Ammonius, on *De Interp.*, p. 110, b. ed. Ald. Venet., 1546. See below, p. 162. — ED. [For the origin of this distinction see Blemmidas (after Aristotle), *Logica*, p. 186.]

[3] *Anal. Prior.*, I. 1, 4. — ED.

[4] *Anal. Prior.*, I. 15, 16, 25. — ED.

Illustration.

Thus in the proposition, *iron is magnetic*, we have *iron* for the Subject, *magnetic* for the Predicate, and the substantive verb *is* for the Copula. In regard to this last, it is necessary to say a few words. "It is not always the case, that in propositions the copula is expressed by the substantive verb *is* or *est*, and that the copula and predicate stand as distinct words. In adjective verbs the copula and predicate coälesce, as in the proposition, *the sun shines*, *sol lucet*, which is equivalent to *the sun is shining*, *sol est lucens*. In existential propositions, that is, those in which mere existence is predicated, the same holds good. For when I say *I am*, *Ego sum*, the *am* or *sum* has here a far higher and more emphatic import than that of the mere copula or link of connection. For it expresses, *I am existing*, *Ego sum existens*. It might seem that, in negative propositions, when the copula is affected by the negative particle, it is converted into a non-copula. But if we take the word *copula* in a wider meaning, for that through which the subject and predicate are connected in a mutual relation, it will apply not only to affirmative but to negative, not only to categorical but to hypothetical and disjunctive, propositions."[1] I may notice that propositions with the subject, predicate, and copula, all three articulately expressed, have been called by the schoolmen those of the *third adjacent* (*propositiones tertii adjacentis*, or *tertii adjecti*), inasmuch as they manifestly contain three parts. This is a barbarous expression for what the Greeks, after Aristotle, called *προτάσεις ἐκ τρίτου (ἔστι) κατηγορουμένου*. For the same reason, propositions with the copula and predicate in one, were called those of the *second adjacent*.[2]

Propositions of the Third Adjacent.

Concepts and judgments, — how far they coincide and differ.

"What has now been said will enable you to perceive how far concepts and judgments coincide, and how far they differ. On the one hand, they coincide in the following respects: In the first place, the concept and the judgment are both products; the one the product of a remote, the other the product of an immediate, act of comparison. In the second place, in both, an object is determined by a character or attribute. Finally, in the third place, in both, things relatively different in existence are reduced to a relative identity in the unity of thought. On the other hand, they differ in the following respects: In the first place, the determination of an object by an attribute is far more express in the judgment than in the concept; for in the one it is developed, in the other, only implied. In the second place, in the concept the unity of thought is founded only on a similarity of quality; in the judgment, on the other hand, it is founded on a similarity of relation. For in the notion, an object and its characters can only be conceived as one, inasmuch as they are congruent and not conflictive, for thus only can they be united into one total concept. But, in the judgment, as a subject and predicate are not necessarily thought under a similarity of quality, the judgment can comprehend not only congruent, but likewise conflictive, and even contradictory, notions; for two concepts which are compared together can be recognized as standing in the relation either of congruence or of repugnance. Such is the sameness, and such is the diversity, of concept and judgment."[1]

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[1] Krug, *Logik*, § 52; Anm., ii, pp. 153-4. — Schulze, *Logik*, p. 74; Crakanthorpe. *Logica*. — Ed. [Compare Bachmann, *Logik*, p. 127; pp. 160, 167.]

[2] See above, p. 161, note 2. — Ed.

We have thus seen that a judgment or proposition consists of three parts or correlative notions, — the notion of a subject, the notion of a predicate, and the notion of the mutual relation of these as determined and determining.

Judgments, — how divided.

Judgments may, I think, be primarily divided in two ways, — the divisions being determined by the general dependencies in which their component parts stand to each other, — and the classes afforded by these divisions, when again considered, without distinction, in the different points of view given by Quantity, Quality, and Relation, will exhaust all the possible forms in which judgments are manifested

Par. XLVIII. First division of Judgments, — Comprehensive and Extensive.

¶ XLVIII. The first great distinction of Judgments is taken from the relation of Subject and Predicate, as reciprocally whole and part. If the Subject or determined notion be viewed as the containing whole, we have an Intensive or Comprehensive proposition; if the Predicate or determining notion be viewed as the containing whole, we have an Extensive proposition.

This distinction of propositions is founded on the distinction of the two quantities of concepts, — their Comprehension and their

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[1] Esser, *Logik*, § 56, p. 111.

Extension. The relation of subject and predicate is contained within that of whole and part, for we can always view either the determining or the determined notion as the whole which contains the other. The whole, however, which the subject constitutes, and the whole which the predicate constitutes, are different, — being severally determined by the opposite quantities of comprehension and of extension; and as subject and predicate necessarily stand to each other in the relation of these inverse quantities, it is manifestly a matter of indifference, in so far as the meaning is concerned, whether we view the subject as the whole of comprehension, which contains the predicate, or the predicate as the whole of extension, which contains the subject. In point of fact, in single propositions it is rarely apparent which of the two wholes is meant; for the copula *is*, *est*, etc., equally denotes the one form of the relation as the other. Thus, in the proposition *man is two-legged*, — the copula here is convertible with *comprehends* or *contains in it*, for the proposition means, *man contains in it two legged;* that is, the subject *man*, as an intensive whole or complex notion, comprehends as a part the predicate *two-legged*. Again, in the proposition *man is a biped*, the copula corresponds to *contained under*, for this proposition is tantamount to *man is contained under biped*, — that is, the predicate *biped*, as an extensive whole or class, contains under it as a part the subject *man*. But, in point of fact, neither of the two propositions unambiguously shows whether it is to be viewed as of an intensive or of an extensive purport; nor in a single proposition is this of any moment. All that can be said is, that the one form of expression is better accommodated to express the one kind of proposition, the other better accommodated to express the other. It is only when propositions are connected into syllogism, that it becomes evident whether the subject or the predicate be the whole in or under which the other is contained; and it is only as thus constituting two different, two contrasted, forms of reasoning, — forms the most general, as under each of these every other is included, — that the distinction becomes necessary in regard to concepts and propositions. The distinction of propositions into Extensive and Intensive, it is needless to say, is, therefore, likewise the most general; and, accordingly, it is only in subordination to this distinction that the other distinctions, of which we are about to treat, are valid.

Explication, — this distinction founded on the Comprehension and Extension of Concepts.

I now proceed to the second division of Judgments, and commence with the following paragraph:

Par. XLIX. Second division of Judgments, — Categorical and Conditional, — the latter of which is subdivided into Hypothetical, Disjunctive, and Dilemmatic.

¶ XLIX. The second division of Judgments is founded on the different mode in which the relation of determination may subsist between the subject and predicate of a proposition. This relation is either *Simple* or *Conditional* (*propositio simplex, propositio conditionalis*). On the former alternative, the proposition is called *Categorical*;[1] on the latter, inasmuch as the condition lies either in the subject or in the predicate, or in both the subject and predicate, there are three species of proposition. In the first case, the proposition is *Hypothetical*, in the second, *Disjunctive*, in the third *Dilemmatic* or *Hypothetico-disjunctive*.[2]

Explication, 1. Categorical Judgments. The term *categorical*.

Its signification as used by Aristotle.

Its meaning in the writings of his disciples.

I shall consider these in their order; and, first, of Categorical propositions. But here it is proper, before proceeding to expound what is designated by the term *categorical*, to commence with an explanation of the term itself. This word, as far as now known, was first employed by Aristotle in a logical signification. I have already explained the meaning of the term *category*;[3] but you are not to suppose that *categorical* has any reference to the ten *summa genera* of the Stagirite. By Aristotle the term κατηγορικὸς is frequently employed, more especially in the books of the *Prior Analytics*, — and in these books alone it occurs, if I am correct in my estimate, eighty-seven times. Now you will observe, that in no single instance is this word applied by Aristotle, except in one unambiguous signification, that is, the signification of *affirmative*; and it is thus by him used as a term convertible with καταφατικὸς, and as opposed to the two synonyms of negation he indifferently employs, — ἀποφατικὸς and στερητικὸς.[4] Such is the meaning of the word in Aristotelic usage. Now you will observe, that it obtained a totally different meaning in the writings of his disciples. This new meaning it probably obtained from Theophrastus, the immediate disciple of Aristotle, for by him and Eudemus we know that it was so employed; — and in this new meaning it was exclusively applied by all the Greek and Latin expositors of the Peripatetic philosophy, in fact, by all subsequent logicians without exception. In this second signification, the term *categorical*, as applied to a proposition, denotes a judgment in which the predicate is simply affirmed or denied of the subject, and in contradistinction to those propositions which have been called *hypothetical* and *disjunctive*. In this change of signification there is nothing very remarkable. But it is a singular circumstance that, though the Aristotelic employment of the word be in every instance altogether clear and unambiguous, no one, either in ancient or in modern times, should ever have made the observation, that the word was used in two different meanings; and that in the one meaning it was used exclusively by Aristotle, and in the other exclusively by all other logicians. I find, indeed, that the Greek commentators on the *Organon* do, in reference to particular passages, sometimes state, that κατηγορικὸς is there used by Aristotle in the signification of *affirmative;* but, in so far as I have been able to ascertain, no one has made the general observation, that the word was never applied by Aristotle in the sense in which alone it was understood by all other logical writers. So much for the meaning of the term *categorical;* as now employed for *simple* or *absolute*, and as opposed to *conditional*, it is used in a sense different from its original and Aristotelic meaning.

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[1] [Categorical had better be called *Absolute*, as is done by Gassendi, *Logica*, p. 287, ed. Oxon; or *Perfect*, as by Mocenicus, who has also *Absolute*. See *Contemplationes Peripateticæ*, ii. c. 2, p. 39 *et seq.*]

[2] Cf. Krug, *Logik*, § 57. — ED. [Mocenicus, *loc. cit.*; Schulze, *Logik*, §§ 45, 52, 60—69.]

[3] See above, p. 139. — ED.

[4] Compare *Discussions*, p. 152. — ED.

This difference of signification not hitherto observed.

Nature of a Categorical Judgment.

In regard to the nature of a Categorical Judgment itself, it is necessary to say almost nothing. For, as this judgment is that in which the two terms stand to each other simply in that relation which every judgment implies, to the exclusion of all extrinsic conditions, it is evident, that what we have already said of the essential nature of judgment in general, affords all that can be said of categorical judgments in particular. A categorical proposition is expressed in the following formulæ — A *is* B, or, A *is not* B. I proceed, therefore, to the genus of propositions as opposed to categorical, — viz., the Conditional, — Conditioned. This genus, as stated in the paragraph, comprises two species, according as the condition lies more proximately in the subject, or in the predicate, to which is to be added, either as a third species or as a compound of these two, those propositions in which there is a twofold condition, the one belonging to the subject, the other to the predicate. The first of these, as stated, forms the class Hypothetical, the second that of Disjunctive, the third that of Dilemmatic, propositions. I may notice, by the way, that there is a good deal of variation in

II. — Conditional Judgments. These comprise three species.

the language of logicians in regard to the terms *Conditional* and *Hypothetical*. You are aware that *conditionalis*, in Latin, is commonly applied as a translation of ὑποθετικὸς in Greek; and by Boethius, who was the first among the Latins who elaborated the logical doctrine of hypotheticals, the two terms are used convertibly with each other.[1] By many of the Schoolmen, however, the term *hypothetical* (*hypotheticus*) was used to denote the genus, and the term *conditional*, to denote the species, and from them this nomenclature has passed into many of the more modern compends of logic, — and, among others, into those of Aldrich and Whately. This latter usage is wrong. If either term is to be used in subordination to the other, *conditional*, as the more extensive term, ought to be applied to designate the genus; and so it has accordingly been employed by the best logicians. But to pass from words to things.

Variations in regard to the application of the terms *Conditional* and *Hypothetical*.

1. Hypothetical.

I said that Hypothetical propositions are those in which the condition qualifying the relation between the subject and predicate lies proximately in the subject. In the proposition, B *is* A, the subject B is unconditionally thought to exist, and it thus constitutes a categorical proposition. But if we think the subject B existing only conditionally, and under this conditional existence enunciate the judgment, we shall have the hypothetical proposition — *If* B *is*, A *is*, — or, in a concrete example — *Rainy weather is wet weather*, is a categorical proposition, — *If it rains, it will be wet*, is a hypothetical. In a hypothetical proposition the objects thought stand in such a mutual relation, that the one can only be thought in so far as the other is thought; in other words, if we think the one, we must necessarily think the other. They thus stand in the relation of Reason and Consequent. For a reason is that which, being affirmed, necessarily entails the affirmation of something else; a consequent is that which is only affirmed, inasmuch as something previous is affirmed. The relation between reason and consequent is necessary. For a reason followed by nothing, would not be the reason of anything, and a consequent which did not proceed from a reason, would not be the consequent of anything. An hypothetical proposition must, therefore, contain a reason and its consequent, and it thus presents the appearance of two members or clauses. The first clause — that which contains the reason — is called the *Antecedent*, also the *Reason*, the *Condi-*

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[1] Compare *Discussions*, p. 150. For Boethius, see his treatise *De Syllogismo Hypothetico*, L. i. — ED.

*tion*, or the *Hypothesis* (*hypothesis*, *conditio*, *ratio*, *antecedens*, — *i. e.*, *membrum* sive *propositio*); the second, which contains the consequent necessitated by this ground, is called the *Consequent*, also the *Thesis* (*consequens*, *thesis*, *rationatum*, *conditionatum*). The relation between the two clauses is called the *Consequence* (*consequentia*), and is expressed by the particles *if* on the one hand, and *then*, *so*, *therefore*, etc., on the other, which are, therefore, called the *Consecutive particles* (*particulæ consecutive*).[1] These are frequently, however, not formally expressed.

A hypothetical judgment not composite.

"This consequence (*if is — then is*) is the copula in hypothetical propositions; for through it the concepts are brought together, so as to make up, in consciousness, but a single act of thought; consequently, in it lies that synthesis, that connection, which constitutes the hypothetical judgment. Although, therefore, a hypothetical judgment appear double, and may be cut into two different judgments, it is nevertheless not a composite judgment. For it is realized through a simple act of thought, in which *if* and *then*, the antecedent and the consequent, are thought at once and as inseparable. The proposition, *if* B *is*, *then* A *is*, is tantamount to the proposition, A *is through* B. But this is as simple an act as if we categorically judged B *is* A, that is, B *is under* A. Of these two, neither the one — *If the sun shines*, nor the other — *then it is day* — if thought apart from the other, will constitute a judgment, but only the two in conjunction. But if we think — *The sun shines, and it is day*, each by itself, then the whole connection between the two thoughts is abolished, and we have nothing more than two isolated categorical judgments. The relatives *if* and *then*, in which the logical synthesis lies, constitute thus an act one and indivisible."

Not convertible into a Categorical.

"For the same reason, a Hypothetical judgment cannot be converted into a Categorical. For the thought, A *is through* B, is wholly different from the thought, A *is in* B. The judgment — *If God is righteous, then will the wicked be punished*, and the judgment — *A righteous God punishes the wicked*, are very different, although the matter of thought is the same. In the former judgment, *the punishment of the wicked* is viewed as a consequent of *the righteousness of God*; whereas the latter considers it is an attribute of *a righteous God*. But as the consequent is regarded as something dependent from, — the attribute, on the contrary, as something inhering in, — it is from two wholly different points of view that the two judgments are formed. The hypothetical judgment, therefore, A *is through* B, is essentially different from the categorical judgment, A *is in* B; and the two judgments are regulated by different fundamental laws. For the Categorical judgment as expressive of the relation of subject and attribute, is determined by the laws of Identity and Contradiction; the Hypothetical, as expressive of the relation of Reason and Consequent, is regulated by the principle of that name."[1] So much for Hypotheticals.

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[1] Krug, *Logik*, § 57, Anm. 2, p. 169. — Ed.

2. Disjunctive.

"Disjunctive judgments are those in which the condition qualifying the relation between the subject and predicate, lies proximately in the predicate, as in the proposition, D *is either* B *or* C, *or* A. In this class of judgments a certain plurality of attributes is predicated of the subject, but in such a manner that this plurality is not predicated conjunctly, but it is only judged that, under conditions some one, and only some one, of this bundle of attributes appertains to the subject. When I say that *Men are either Black, or White, or Tawny*, — in this proposition, none of these three predicates is unconditionally affirmed; but it is only assumed that one or other may be affirmed, and that, any one being so affirmed, the others must, *eo ipso*, be denied. The attributes thus disjunctively predicable of the subject, constitute together a certain sphere or whole of extension; and as the attributes mutually exclude each other, they may be regarded as reciprocally reason and consequent. A disjunctive proposition has two forms, according as it is regulated by a contradictory, or by a contrary, opposition. A *is either* B *or not* B, — *This mineral is either a metal or not*, — are examples of the former; A *is either* B, *or* C, *or* D, — *This mineral is either lead, or tin, or zinc*, — are examples of the latter. The opposite attributes or characters in a disjunctive proposition are called the *Disjunct Members* (*membra disjuncta*); and their relation to each other is called the *Disjunction* (*disjunctio*), which in English is expressed by the relative particles *either*, *or* (*aut*, *vel*), in consequence of which these words constitute the *Disjunctive particles* (*particulæ disjunctivæ*). In propositions of this class the copula is formed by *either is*, — *or is*, for hereby the concepts are brought together so as to constitute a single object of consciousness, and thus a synthesis or union of notions is effected."

"Now, although in consequence of the multiplicity of its predicates, a disjunctive proposition may be resolved into a plurality of judgments, still it is not on that account a complex or composite judgment. For it is realized by one simple energy of thought, in which the two relatives — the *either* and the *or* — are thought together, as inseparable, and as binding up the opposing predicates into a single sphere. In consequence of this, a disjunctive proposition cannot be converted into a categorical. For in a categorical judgment a single predicate is simply affirmed or denied of a subject; whereas in a disjunctive judgment there is neither affirmation nor negation, but the opposition of certain attributes in relation to a certain subject constitutes the thought. Howbeit, therefore, that a disjunctive and a categorical judgment may have a certain resemblance in respect of their object matter; still in each the form of thought is wholly different, and the disjunctive judgment is, consequently, one essentially different from the categorical."[1]

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[1] Krug, *Logik*, § 57, p. 168, Anm. 2. — ED. [Hypotheticals take account not of the correctness of the two clauses, but only of their connection (*consequentia*). Hence the logical rule, *Propositio Conditionalis nihil ponit in esse*. Christian Weiss, *Lehrbuch der Logik*, p. 109, ed 1801.]

A Disjunctive judgment, not in reality composite, and not convertible into a Categorical.

3. Dilemmatic.

Dilemmatic judgments are those in which a condition is found, both in the subject and in the predicate, and as thus a combination of an hypothetical form and of a disjunctive form, they may also appropriately be denominated *Hypothetico-disjunctive*. *If* X *is* A, *it is either* B *or* C — *If an action be prohibited, it is prohibited either by natural or by positive law* — *If a cognition be a cognition of fact, it is given either through an act of external perception or through an act of self-consciousness.* In such propositions, it is not necessary that the disjunct predicates should be limited to two; and besides what are strictly called *dilemmatic judgments*, we may have others that would properly obtain the names of *trilemmatic*, *tetralemmatic*, *polylemmatic*, etc. But in reference to propositions, as in reference to syllogisms, *dilemma* is a word used not merely to denote the cases where there are only two disjunct members, but is, likewise, extended to any plurality of opposing predicates. There remains here, however, always an ambiguity; and perhaps, on that account, the term *hypothetico-disjunctive* might with propriety be substituted for *dilemmatic*. A proposition of this class, though bearing both an hypothetical and a disjunctive form, cannot, however, be analyzed into an hypothetical and a disjunctive judgment. It constitutes as indivisible a unity of thought as either of these; and can as little as these be reduced without distinction to a plurality of categorical propositions.

A Dilemmatic Judgment indivisible, and not reducible to a plurality of categorical propositions.

Every form of Judgments which we have hitherto considered, has its corresponding form of Syllogism; and it is as constituting the foundations of different kinds of reasoning, that the consideration of these different kinds of propositions is of principal importance. These various kinds of propositions may, however, be considered in the different points of view of Quantity, Quality, and Relation. And first of Quantity; in reference to which I give you the following paragraph.

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[1] Krug, *Logik*, pp. 170, 171. Compare Kant, *Logik*, § 29. — Ed.

Judgments considered in reference to Quantity.

¶ L. The Quantity of Judgments has reference to the whole of Extension, by the number of the objects concerning which we judge. On this I shall state articulately, 1°, The doctrine of the Logicians; and, 2°, The doctrine which I conceive to be the more correct.

**Par. L. 1°. The common doctrine of the division of Judgments according to their Quantity. 2°. The doctrine of the author on this point.**

1°. (The doctrine of the Logicians.) The common doctrine, which, in essentials, dates from Aristotle,[1] divides Propositions according to their Quantity into four classes; viz., (A) the *Universal* or *General* (*pr. universales*, *generales*, προτάσεις αἱ καθόλου); (B) the *Particular* (*pr. particulares* προτάσεις μερικαί, αἱ ἐν μέρει); (C) the *Individual* or *Singular* (*pr. individuales*, *singulares*, *expositoriæ*, προτάσεις αἱ καθ᾽ ἕκαστον, τὰ ἄτομα); (D) the *Indefinite* (*pr. impræfinitæ*, *indefinitæ*, προτάσεις ἀδιόριστοι, ἀπροσδιόριστοι). They mean by *universal propositions*, those in which the subject is taken in its whole extension; by *particular propositions*, those in which the subject is taken in a part, indefinitely, of its extension; by *individual propositions*, those in which the subject is at a minimum of extension; by *indefinite propositions*, those in which the subject is not articulately or overtly declared to be either universal, particular, or individual.

2°. (The doctrine I prefer.) This doctrine appears to me untenable, and I divide Propositions according to their Quantity in the following manner: — In this respect their differences arise either (A), as in Judgments, from the necessary condition of the Internal Thought; or (B), as in Propositions, merely from the accidental circumstances of its External Expression.

Under the former head (A), Judgments are either (a) of Determinate or Definite Quantity, according as their sphere is circumscribed, or (b) of Quantity Indeterminate or Indefinite, according as their sphere is uncircumscribed. — Again, Judgments of a Determinate Quantity (a) are either (1) of a Whole

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[1] *De Interp.*, c. 7. *Anal. Prior.*, i. 1. — Ed.

Undivided, in which case they constitute a *Universal* or *General Proposition;* or (2) of a Unit Indivisible, in which case, they constitute an *Individual* or *Singular Proposition.* — A Judgment of an Indeterminate Quantity (b) constitutes a *Particular Proposition.*

Under the latter head (B), Propositions have either, as propositions, their quantity, determinate or indeterminate, marked out by a verbal sign, or they have not; such quantity being involved in every actual thought. They may be called in the one case (a) *Predesignate;* in the other (b) *Preindesignate.*

Again, the common doctrine, remounting also to Aristotle,[1] takes into view only the Subject, and regulates the quantity of the proposition exclusively by the quantity of that term. The Predicate, indeed, Aristotle and the logicians do not allow to be affected by quantity; at least they hold it to be always Particular in an Affirmative, and Universal in a Negative Proposition.

This doctrine I hold to be the result of an incomplete analysis; and I hope to show you that the confusion and multiplicity of which our present Logic is the complement, is mainly the consequence of an attempt at synthesis, before the ultimate elements had been fairly reached by a searching analysis, and of a neglect, in this instance, of the fundamental postulate of the science.

(Mental) Judgments
- a — of Determinate or Definite Quantity.
  - 1. — of a Whole Undivided — Universal or General Judgments.
  - 2. — of a Unit Indivisible — Individual or Singular Judgments.
- b — of Indeterminate or Indefinite Quantity — forming Particular Judgments.

B (Verbal) Propositions
- a — their Quantity Expressed — Predesignate.
- b — their Quantity Not Expressed — Preindesignate.[2]

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[1] *De Interp.*, c. 7. — Ed.

[2] Vide Th. et Am. apud Am. *In De Int.*, 8vo. ff. 72, 111–113. [In the first of these passages, Ammonius, proceeding on a merely arithmetical calculation, enumerates sixteen varieties of the Proposition, any one of four quantities in the subject, — (*all — not all, none — not none* or *some*), being capable of combination with any one of four quantities in the predicate. But of these some are but verbal varieties of the same judgment, and others are excluded on material grounds, so that his division finally coincides with Aristotle's. In the second passage Theophrastus is cited in illustration of a very obscure statement concerning the opposition of indesignate propositions. — Ed.]

Explication. Universal Judgments.

Universal Judgments are those in which the whole number of objects within a sphere or class are judged of, — as *All men are mortal*, or *Every man is mortal*, the *all* in the one case defining the whole collectively, — the *every* in the other defining it discretively. In such judgments the notion of a determinate wholeness or totality, in the form of omnitude or allness, is involved.

Singular or Individual Judgments, — what.

Individual Judgments are those in which, in like manner, the whole of a certain sphere is judged of, but in which sphere there is found only a single object, or collection of single objects, — as *Catiline is ambitious*, — *The twelve apostles were inspired.* In such judgments the notion of determinate wholeness or totality in the form of oneness, indivisible unity, is involved.[1]

Particular Judgments, — what.

Particular Judgments are those in which, among the objects within a certain sphere or class, we judge concerning some indefinite number less than the whole, — as *Some men are virtuous* — *Many boys are courageous* — *Most women are compassionate.* The indefinite plurality, within the totality, being here denoted by the words *some*, *many*, *most*.

Words which serve to mark out quantity in Universal, Individual, and Particular Propositions.

There are certain words which serve to mark out the quantity in the case of Universal, Individual, and Particular propositions. The words which designate universality are *all*, *the whole of*, *every*, *both*, *each*, *none*, *no one*, *neither*, *always*, *everywhere*, etc. The words which mark out particularity are *some*, *not all*, *one*, *two*, *three*, etc., *sometimes*, *somewhere*, etc. There are also terms which, though they do not reach to an universal whole, approximate to it, as *many*, *most*, *almost all*, *the greatest part*, etc., *few*, *very few*, *hardly any*, etc., which, in the common employment of language, and in reference to merely probable matter, may be viewed as almost tantamount to marks of universality.

Distinction of Universal and Individual from Particular Judgments.

By logicians in general it is stated, that, in a logical relation, an Individual is convertible with an Universal proposition; as in both something is predicated of a whole subject, and neither admits of any exception. But a Particular Judgment, likewise, predicates something of a whole subject, and admits of no exception; for it embraces all that is viewed as the subject, and excludes all that is viewed as not belonging to it.

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[1] *Individuum (proprium) signatum*, and *individuum vagum*. So *particulare signatum*, and *particulare vagum*. The former of each, and the latter of each, corresponding. — *Memoranda*.

The whole distinction consists in this, — that, in Universal and in Individual Judgments, the number of the objects judged of is thought by us as definite; whereas, in Particular Judgments, the number of such objects is thought by us as indefinite. That Individual Judgments do not correspond to Universal Judgments, merely in virtue of the oneness of their subject, is shown by this, — that, if the individual be rendered indefinite, the judgment at once assumes the character of particularity. For example, the propositions, — *A German invented the art of printing*, — *An Englishman generalized the law of gravitation*, — are to be viewed as particular propositions. But, if we substitute for the indefinite expressions *a German* and *an Englishman*, the definite expressions *Faust* and *Newton*, the judgment obtains the form of an universal.

Categorical Judgments alone, according to logicians, admit of all the forms of quantity.

With regard to quantity, it is to be observed, say the logicians, that Categorical Judgments are those alone which admit of all the forms. "Hypothetical and Disjunctive propositions are always universal. For in hypotheticals, by the position of a reason, there is posited every consequent of that reason; and in disjunctives the sphere or extension of the subject is so defined, that the disjunct attributes are predicated of the whole sphere. It may, indeed, sometimes seem as if in such propositions something were said of some, and, consequently, that the judgment is particular or indefinite. For example, as an hypothetical, — *If some men are learned, then others are unlearned;* as a disjunctive, — *Those men who are learned are either philosophers or not*. But it is easily seen that these judgments are essentially of a general character. In the first judgment, the real consequent is, — *then all others are unlearned;* and in the second, the true subject is, — *all learned men*, for this is involved in the expression — *Those men who are learned*, etc."[1]

This doctrine erroneous.

Such is the doctrine of the Logicians. This I cannot but hold to be erroneous; for we can easily construct propositions, whether hypothetical or disjunctive, which cannot be construed either as universal or singular. For example, when we say, hypothetically, — *If some Dodo is, then some animal is;* or, disjunctively, — *Some men are either rogues or fools:* — in either case, the proposition is indefinite or particular, and no ingenuity can show a plausible reason why it should be viewed as definite, — as general or individual.

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[1] Krug, *Logik*, § 57. Anm. 4. p. 171 *et seq.* — Ed. [Cf. Hoffbauer, *Anfangsgrunke der Logik*, § 243. Sigwart, *Logik*, § 164 *et seq.*, ed. 1835. Kiesewetter, *Grundriss einer allgemeinen Logik*, i. § 122. Schulze, *Logik*, § 60. *Contra;* — Esser, *Logik*, § 92, p. 177. — [See below, p. 237 note 1. — Ed.]

# LECTURE XIV.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### II.—APOPHANTIC.

### JUDGMENTS.—THEIR QUALITY, OPPOSITION, AND CONVERSION.

Recapitulation.

The first part of our last Lecture was occupied with the doctrine of Judgments, considered as divided into Simple and into Conditional; Simple being exclusively Categorical, Conditional, either Hypothetical, Disjunctive, or Hypothetico-disjunctive. We then proceeded to treat of the Quantity of propositions, and, in this respect, I stated that they are either Definite or Indefinite; the Definite comprising the two subordinate classes of General or Universal, and of Singular or Individual propositions, while the Indefinite are correspondent to Particular propositions alone. In regard to the terms *definite* and *indefinite*, I warned you that I do not apply them in the sense given by logical writers. With them, Indefinite propositions denote those in which the quantity is not explicitly declared by one of the designatory terms, *all*, *every*. *some*, *many*, etc. Such propositions, however, ought to be called *pre-indesignate* (*præ-indesignatæ*, ἀπροσδιόριστοι), that is, *not marked out by a prefix*,—a term better adapted to indicate this external accident of their enunciation; for, in point of fact, these preindesignate propositions are either definite or indefinite, and quite as definite or indefinite in meaning, as if their quantity had been expressly marked out by the predesignatory terms.

Second division of Judgments, or that according to their Quality.

This being premised, I now go on to the next division of Judgments—the division proceeding on that ground which by Logicians has been called the *Quality* of Judgments. In itself the term *quality* is here a very vague and arbitrary expression, for we might, with equal propriety, give the name of *quality* to several other of the distinguishing principles of propositions. For example the truth or falsehood of propositions has been also called their *quality*; and some logicians have even given the name of *quality* to the ground of the distinction of judgments into categorical, hypothetical, and disjunctive. What, however, has been universally, if not always exclusively, styled the *quality* of propositions, both in ancient and modern times, is that according to which they are distributed into Affirmative and Negative.

Par. LI. Judgments, in respect of their Quality, are Affirmative and Negative.

¶ LI. In respect of their Quality, Judgments are divided into two classes. For either the Subject and Predicate may be recognized as reciprocally containing and contained, in the opposite quantities of Extension and Comprehension; or they may be recognized as not standing in this relasion. In the former case, the subject and predicate are affirmed of each other, and the proposition is called an *Affirmative* (πρότασις καταφατική or κατηγορική, *judicium affirmativum* or *positivum*); in the latter case, they are denied of each other, and the proposition is called a *Negative* (πρότασις ἀποφατική or στερητική, *judicium negativum*).

Explication. Generality of the definition of predication in the paragraph.

In this paragraph, I have enounced more generally than is done by logicians the relation of predication, in its affirmative and negative phases. For their definitions only apply either to the subject or to the predicate, taken as a whole; whereas, since we may indifferently view either the subject as the whole in relation to the predicate, or the predicate as the whole in relation to the subject, according as we consider the proposition to express an intensive or to express an extensive judgment, — it is proper in our definition, whether of predication in general, or of affirmation and negation in particular, to couch it in such terms that it may indifferently comprehend both these classes, — both these phases, of propositions.

Affirmative and Negative Propositions.

As examples of Affirmative and Negative propositions, the following may suffice: — A *is* B — A *is not* B — *God is merciful* — *God is not vindictive.* In an Affirmative judgment, there is a complete inclusion of the subject within the predicate as an extensive whole; or of the predicate within the subject as an intensive whole. In Negative judgments, on the contrary, there is a total exclusion of the subject from the sphere of the predicate (extensively), or of the predicate from the comprehension of the subject (intensively). In affirmative propositions there is also distinctly enounced through what predicate the notion of the subject is to be thought, that is, what predicate must be annexed to the notion of the subject; in negative propositions, in like manner, it is distinctly enounced through what predicate the notion of the subject is not to be thought, that is, what predicate must be shut out from the notion of the subject. In negative judgments, therefore, the negation essentially belongs to the Copula; for otherwise all propositions without distinction would be affirmative. This, however, has been a point of controversy among modern logicians; for many maintain that the negation belongs to the predicate, on the following grounds: — If the negation pertained to the copula, there could be no synthesis of the two terms, — the whole act of judgment would be subverted, — while at the same time a non-connecting copula, a non-copulative, is a contradiction in terms. But a negative predicate, that is, a predicate by which something is taken away or excluded from the subject, involves nothing contradictory; and, therefore, a judgment with such a predicate is competent.[1]

That Negation does not belong to the Copula, held by some logicians.

The opposite doctrine is, however, undoubtedly the more correct. For if we place the negation in the predicate, negative judgments, as already said, are not different in form from affirmative, being merely affirmations that the object is contained within the sphere of a negative predicate, or that a negative predicate forms one of the attributes of the subject. This, however, the advocates of the opinion in question do not venture to assert. The objection from the apparent contradiction of a non-connecting copula is valid only if the literal, the grammatical, meaning of the term *copula* be coëxtensive with that which it is applied logically to express. But this is not the case. If literally taken, it indicates only one side of its logical meaning. What the word *copula* very inadequately denotes, in the form of the relation between the subject and predicate of a judgment. Now, in negative judgments, this form

The opposite doctrine maintained by the Author.

True import of the logical copula.

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[1] Krug, *Logik*, § 55, Anm. 3. — Ed. [Compare on the same side Buffier, *Logique*, i., § 75 *et seq.* Bolzano. *Wiessenschaftslehre*, *Logik*, vol. ii , §§ 127, 129, 136. Schulze, *Logik*, § 50, p. 74. Bardili. *Grundriss der ersten Logik.* § 12 Derodon, *Logica*, p 642 Cf. p. 515 *et seq.* *Contra:* — Kant, *Logik*, § 22, Anm. 3. Bachmann, *Logik*, § 84, p. 127. Esser, *Logik*, § 59, p. 115 ]

essentially consists in the act of taking a part out of a whole, and is as necessary an act of thought as the putting it in. The notion of the one contradictory in fact involves the notion of the other.[1]

Origin of the controversy regarding the place of negation

The controversy took its origin in this, — that every negative judgment can be expressed in an affirmative form, when the negation is taken from the copula and placed in the predicate. Thus, A *is not* B may be changed into, — A *is not*-B. The contrast is better expressed in Latin, A *non est* B — A *est non*-B. In fact, we are compelled in English to borrow the Latin *non* to make the difference unambiguously apparent, saying, A *is non*-B, instead of A *is not*-B. But this proves nothing; for by this transposition of the negation from the copula to the predicate, we are also enabled to express every affirmative proposition through a double negation. Thus, A *is* B, in the affirmative form is equivalently enounced by A *is not non*-B — A *non est non*-B, in the negative.

Negative terms, — how designated by Aristotle

By Boethius.

By the Schoolmen

This possibility of enunciating negative propositions in an affirmative, and affirmative propositions in a negative form, has been the occasion of much perverse refinement among logicians. Aristotle[2] denominated the negative terms, such as *non* B, *non homo*, *non albus*, etc. ὀνόματα ἀόριστα, literally, *indefinite nouns*, Boethius,[3] however, unhappily translated Aristotle's Greek term ἀόριστος by the Latin *infinitus*, reserving the term *indefinitus* to render ἀδιόριστος as applied to propositions, but of which the notion is more appropriately expressed, as we have seen, by the word *indesignate* (*indesignatus*), or better *preindesignate* (*præindesignatus*). The Schoolmen, following Boethius, thus called the ὀνόματα ἀόριστα of Aristotle *nomina infinita:* and the *non* they styled the *particula infinitans.* Out of such elements they also constructed *Propositiones Infinitæ;* that is, judgments in which either the subject or the predicate was a negative notion, as *non-homo est viridis*, and *homo est non-viridis*, and these they distinguished from the simple negative, *homo — non est — viridis.* Herein Boethius and the schoolmen have been followed by Kant,[4] through the Wolfian logicians; for he explains Infinite Judg-

*Propositiones Infinitæ* of the schoolmen, — what.

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[1] Bachmann, *Logik*, p. 127. — Ed.

[2] *De Interpretatione*, c. 2. — Ed.

[3] *In De Interpretatione*, L. ii. § 1. *Opera*, p. 250. — Ed.

[4] *Logik*, § 22. Compare Wolf, *Philos. Ration.*, § 209. — Ed.

ments as those which do not simply indicate, that a subject is not contained under the sphere of a predicate, but that it lies out of its sphere, somewhere in the infinite sphere. He has thus considered them as combining an act of negation and an act of affirmation, inasmuch as one thing is affirmed in them through the negation of another. In consequence of this view, he gave them, after some Wolfians, the name of *Limitative*, which he constituted as a third form of judgments under quality, — all propositions being thus either Affirmative, Negative, or Limitative. The whole question touching the validity of the distinction is of no practical consequence; and consists merely in whether a greater or less latitude is to be given to certain terms. I shall not, therefore, occupy your attention by entering on any discussion of what may be urged in refutation or defence. But if what I have already stated of the nature of negation and its connection with the copula, be correct, there is no ground for regarding limitative propositions as a class distinct in form, and coördinate with Affirmative and Negative judgments.[1]

On this point followed by Kant.

Kant's three-fold division of Propositions unfounded.

If we consider the quantity and quality of judgments as combined, there emerges from this juncture four separate forms of propositions, for they are either Universal Affirmative, or Universal Negative, Particular Affirmative, or Particular Negative. These forms, in order to facilitate the statement and analysis of the syllogism, have been designated by letters, and as it is necessary that you should be familiar with these symbols, I shall state them in the following paragraph.

¶ LII. In reference to their Quantity and Quality together, Propositions are designated by the vowels A, E, I, O. The *Universal Affirmative* are denoted by A; the *Universal Negative* by E; the *Particular Affirmative* by I; the *Particular Negative* by O. To aid the memory, these distinctions have been comprehended in the following lines:

Par. LII. Division of Propositions according to their Quantity and Quality taken together.

Asserit A, negat E, sed universaliter ambæ,
Asserit I, negat O, sed particulariter ambo.[2]

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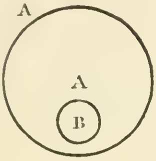
[1] Compare Krug, *Logik*, § 55. Anm. 2. — Ed. [Against the distinction, see Bachmann, *Logik*, § 84, p. 128. Schulze, *Logik*, § 50 *Drobisch*, § 42.]

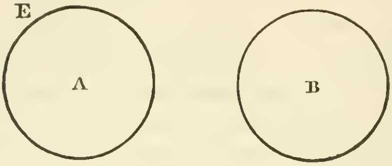
[2] Petrus Hispanus, *Summulæ*, Tract. f. partic. 4, f. 9. Cf. Petrus Tartaretus; *Expositio in Summulas*, Tract. i. f. 9 b. — Ed.

I may here, likewise, show you one, and perhaps the best, mode, in which these different forms can be expressed by diagrams.

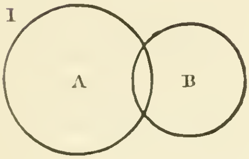
A



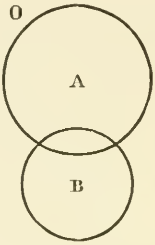
E



I



O



The first employment of circular diagrams in logic improperly ascribed to Euler. To be found in Christian Weise.

The invention of this mode of sensualizing by circles the abstractions of Logic, is generally given to Euler, who employs it in his *Letters to a German Princess on different Matters of Physics and Philosophy.*[1] But, to say nothing of other methods, this by circles is of a much earlier origin. For I find it in the *Nucleus Logicæ Weisianæ*, which appeared in 1712; but this was a posthumous publication, and the author, Christian Weise, who was Rector of Zittau, died in 1708.

Lambert's method to be found in Alstedius.

I may notice, also, that Lambert's method of accomplishing the same end, by parallel lines of different lengths, is to be found in the *Logic* of Alstedius, published in 1614, consequently above a century and a half prior to Lambert's *Neues Organon.*[2] Of Lambert's originality there can, however, I think, be no doubt; for he was exceedingly curious about, and not overlearned in, the history of these subsidia, while in his philosophical correspondence many other inventions of the kind, of far inferior interest, are recorded, but there is no allusion whatever to that of Alstedius.

Before leaving this part of the subject, I may take notice of another division of Propositions, made by all logicians — viz., into *Pure* and *Modal*. Pure propositions are those in which the predicate is categorically affirmed or denied of the subject, simply, without any qualification; Modal, those in which the predicate is categorically affirmed or denied of the subject, under some mode or qualifying determination. For example, — *Alexander conquered Darius*, is a pure, — *Alexander conquered Darius honorably*, is a modal proposition.[1] Nothing can be more futile than this distinction. The mode in such propositions is nothing more than a part of the predicate. The predicate may be a notion of any complexity, it may consist of any number of attributes, of any number even of words, and the mere circumstance that one of these attributes should stand prominently out by itself, can establish no difference in which to originate a distinction of the kind. Of the examples adduced, — the pure proposition, *Alexander conquered Darius*, means, being resolved, *Alexander was the conqueror of Darius*, — *Alexander* being the subject, *was* the copula, and *the conqueror of Darius* the predicate. Now, if we take the modal, — *Alexander conquered Darius honorably*, and resolve it in like manner, we shall have *Alexander was the honorable conqueror of Darius;* and here the whole difference is, that in the second the predicate is a litle more complex, being *the honorable conqueror of Darius*, instead of *the conqueror of Darius.*

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[1] Partie i., Lettre xxxv., ed. Cournot.—Ed.

[2] A very imperfect diagram of this kind, with the lines of equal length, in illustration of the first syllogistic figure, is given in the *Logicæ Systema Harmonicum* of Alstedius (1614), p. 395. Lambert's diagrams (*Neues Organon*, vol i. p. 111 *et seq.*) are much more complete. — Ed.

Distinction of Propositions into Pure and Modal.

This distinction futile.

But logicians, after Aristotle,[2] have principally considered as modal propositions those that are modified by the four attributions of Necessity, Impossibility, Contingence, and Possibility. But, in regard to these, the case is precisely the same; the mode is merely a part of the predicate, and if so, nothing can be more unwarranted than on this accidental, on this extra-logical, circumstance to establish a great division of logical propositions. This error is seen in all its flagrancy when applied to practice. The discrimination of propositions into Pure and Modal, and the discrimination of Modal propositions into Necessary, Impossible, Contingent, Possible, and the recognition of these as logical distinctions, rendered it imperative on the logician, as logician, to know what matter was necessary, impossible, contingent, and possible. For rules were laid

Division of Modal Propositions by logicians. Modals as involving the consideration of the matter of a proposition are extra-logical.

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[1] These modals are not acknowledged by Aristotle, who allows only the four mentioned below. They appear, however, in his Greek commentators, and from them were adopted by the Schoolmen. Compare Ammonius, *In De Interp.*, p. 148 b, ed. 1546. — Ed.

[2] *De Interp.*, c. 12. Compare *Anal. Prior.*, i. 2. — Ed.

down in regard to the various logical operations to which propositions were subjected, according as these were determined by a matter of one of these modes or of another, and this, too, when the modal character itself was not marked out by any peculiarity or form of expression. Thus, to take one of many passages to the same effect in Whately; speaking of the quality of propositions, he says, "When the subject of a proposition is a Common-term, the *universal signs* ('all, no, every,') are used to indicate that it is distributed (and the proposition consequently is universal); the *particular signs* ('some, etc.'), the contrary. Should there be *no sign* at all to the common term, the quantity of the proposition (which is called an *Indefinite* proposition) is ascertained by the *matter; i.e.*, the nature of the connection between the extremes: which is either Necessary, Impossible, or Contingent. In necessary and impossible matter, an Indefinite is *understood as a universal; e.g.*, birds have wings; *i.e., all:* birds are not quadrupeds; *i.e., none:* in contingent matter (*i.e.*, where the terms partly (*i.e.* sometimes) agree, and partly not), an Indefinite is understood as a particular; *e.g.*, food is necessary to life; *i.e., some* food; birds sing; *i.e., some* do; birds are not carnivorous; *i.e., some* are not, or all are not."[1]

Whately quoted.

Criticized.

On the supposition that Logic takes cognizance of the modality of objects, this science can have no existence.

Now all this proceeds upon a radical mistake of the nature and domain of Logic. Logic is a purely formal science; it knows nothing of, it establishes nothing upon, the circumstances of the matter, to which its form may chance to be applied. To be able to say that a thing is of necessary, impossible, or contingent matter, it is requisite to generalize its nature from an extensive observation; and to make it incumbent on the logician to know the modality of all the objects to which his science may be applied, is at once to declare that Logic has no existence; for this condition of its existence is in every point of view impossible. It is impossible — 1°, Inasmuch as Logic would thus presuppose a knowledge of the whole cycle of human science; and it is impossible — 2°, Because it is not now, and never will be, determined what things are of necessary or contingent, of possible or impossible existence. Speaking of things impossible in nature, Sir Thomas Brown declared that it is impossible that a quadruped could lay an egg, or that a quadruped could possess the beak of a bird; and, in the age of Sir Thomas Brown, these propositions would have shown as good a title to be regarded as of impossible matter as some of the examples adduced by Dr. Whately. The discovery of New Holland, and of the Ornithorhynchus, however, turned the impossible into the actual; for, in that animal, there is found a quadruped which at once lays an egg and presents the bill of a duck. On the principle, then, that Logic is exclusively conversant about the forms of thought, I have rejected the distinction of propositions and syllogisms into pure and modal, as extra-logical. Whatever cannot be stated by A, B, C, is not of logical import; and A, B, C, know nothing of the necessary, impossible, and contingent.[1]

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[1] *Elements of Logik*, book ii. chap. ii. § 2, pp. 63, 64.

Explanation of three terms used in reference to Pure and Modal Propositions.

It may be proper, however, to explain to you the meaning of three terms which are used in relation to Pure and Modal propositions. A proposition is called *Assertory*, when it enounces what is known as actual; *Problematic*, when it enounces what is known as possible; *Apodeictic* or *Demonstrative*, when it enounces what is known as necessary.[2]

Third Division of Judgments—Relation to each other.

The last point of view in which judgments are considered, is their Relation to each other. In respect of these relations, propositions have obtained from Logicians particular names, which, however, cannot be understood without at the same time regarding the matter which the judgments contain. As the distinctions of Judgments and of Concepts are, in this respect, in a great measure analogous, both in name and nature, it will not be necessary to dictate them.

Judgments Identical.

Different.

Relatively Identical.

Disparate.

Disjunct.

When the matter and form of two judgments are considered as the same, they are called *Identical*, *Convertible*, *Equal* or *Equivalent* (*propositiones identicæ, pares, convertibiles, æquipollentes*); on the opposite alternative, they are called *Different* (*pr. diversæ*). If considered in certain respects the same, in others different, they are called *Relatively Identical*, *Similar*, or *Cognate* (*pr. relative identicæ, similes, affines, cognatæ*). This resemblance may be either in the subject and comprehension, or in the predicate and extension. If they have a similar subject, their predicates are *Disparate* (*disparata*), if a similar predicate, their subjects are *Disjunct* (*disjuncta*).

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[1] See *Discussions*, p. 145 *et seq.* — Ed. [Compare Bachmann, *Logik*, § 73, p. 115; Richter, *Logik*, § 19. p. 72, and § 23, p. 79; Schulze, *Logik*, § 52, p. 78.]

[2] Kant, *Logik*, § 30 — Ed.

Sub-alternant.

Subalternate.

When two judgments differ merely in their quantity of extension, and the one is, therefore, a particular, the other a general, they are said to be subordinated, and their relation is called *Subordination* (*subordinatio*). The subordinating (or as it might, perhaps, be more properly styled, the *superordinate*) judgment, is called the *Subalternant* (*subalternans*); the subordinate judgment is called the *Subalternate* (*subalternatum*).

Opposition of Judgments.

Contradiction.

Contrariety.

When, of two or more judgments, the one affirms, the other denies, and when they are thus reciprocally different in quality, they are said to be *Opposed* or *Conflictive* (*pr. oppositæ*, ἀντικείμεναι), and their relation, in this respect, is called *Opposition* (*oppositio*). This opposition is either that of *Contradiction* or *Repugnance* (*contradictio*, ἀντίφασις), or that of *Contrariety* (*contrarietas*, ἐναντιότης).

Congruent Judgments.

Subcontrary opposition.

Not a real opposition.

If neither contradiction nor contrariety exists, the judgments are called *Congruent* (*pr. congruentes*, *consonantes*, *consentientes*). In regard to this last statement, you will find in logical books, in general,[1] that there is an opposition of what are called *Subcontraries* (*subcontraria*), meaning by these particular propositions of different quality, as, for example, *some* A *are* B, *some* A *are not* B; or, *some men are learned*, *some men are not learned;* and they are called *Subcontraries*, as they stand subordinated to the universal contrary propositions, — All A *are* B, *no* A *is* B; or, *All men are learned*, *no man is learned.* But this is a mistake, there is no opposition between Subcontraries; for both may at once be maintained, as both at once must be true if the *some* be a negation of *all.* They cannot, however, both be false. The opposition in this case is only apparent;[2] and it was probably only laid down from a love of symmetry, in order to make out the opposition of all the corners in the square of Opposition, which you will find in almost every work on Logic.

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[1] *Elements of Logik*, by Dr. Whately, part ii. chap. ii. § 3, p. 68, 3d edit. But see Scheibler. *Opera Logica*, Pars iii. c. xi. p. 487, ed. 1665. Ulrich, [*Instit. Log. et Met.*, § 183, p. 190. — Ed.]

[2] For which reason Aristotle describes it as an opposition in language, but not in reality. *Anal. Prior.*, ii. 15. — Ed. [Compare Fonseca, *Instit. Dialect.*, L. iii. c. 6, p. 129, ed. 1604. *Conimbricensis Nova Logica*, Tract iii. Disp. iii., § 2, p. 124, edit. 1711. Kant expressly rejects Subcontrariety, *Logik*, § 50, Anm. Compare Krug, *Logik*, § 64, Anm. 4 Braniss, *Grundriss der Logik*, p. 105. Denzinger, *Institutiones Logicæ*, vol. ii. § 713, p. 138. Caramuel, p. 33 [*Rationalis et Realis Philosophia, authore Ioanne Caramuel Lobkowitz, S. Th. Lovaniensi Doctore, Abbate Melrosensi*, Lovanii, 1642. — Ed ]

Conversion of Propositions.

Finally, various relations of judgments arise from what is called their *Conversion*. When the subject and predicate in a categorical proposition (for to this we now limit our consideration) are transposed, the proposition is said to be converted; the proposition given and its product are both called the *judicia conversa;* the relation itself of reciprocation in which the judgments stand is called *Conversion*, sometimes *Obversion* and *Transposition* (*reciprocatio, conversio, obversio, transpositio*, μετάθεσις, μεταβολή, ἀντιστροφή).

Terms employed to denote the original and converted proposition.

The given proposition is called the *Converted* or *Converse* (*judicium, propositio, præjacens, conversum, conversa*); the other, into which it is converted, the *Converting* (*jud., prop., convertens*). There is, however, much ambiguity, to say the least of it, in the terms commonly employed by Logicians to designate the two propositions, — that given, and that the product of the logical elaboration. The *prejacent* and *subjacent* may pass, but they have been very rarely employed. The term *propositio conversa*, the converse or converted judgment, specially for the original proposition, is worse than ambiguous; it is applied generally to both judgments; it may, in fact, more appropriately denote the other, — its product, — to which indeed it has, but through a blunder, been actually applied by Aldrich,[1] and he is followed, of course, by Whately. The original proposition ought to be called the *Convertend* or *Convertible* (*pr. convertenda, convertibilis*).[2] The term *Converting* (*convertens*) employed for the proposition, the product of conversion, marks out nothing of its peculiar character.

*Propositis exposita* — its use by Aldrich erroneous.

The expression *pr. exposita*, applied by Aldrich,[3] without a word of comment, to this judgment, is only another instance of his daring ignorance; for the phrase *pr. exposita* had nothing to recommend it in this relation, and was employed in a wholly different meaning by logicians and mathematicians.[4] In this error Aldrich is followed by Whately, who, like his able predecessor, is wholly unversed in the literature and language of Logic.

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[1] *Rudimenta Logicæ*, L. i. c. ii.

[2] [So Noldius, p. 263, [*Logica Recognita*, Hafniæ, 1766. — Ed.]

[3] Crakanthorpe, Sanderson, and Wallis [denominate the original proposition *pr. conversa*, its product *pr. convertens*. See Crakanthorpe, *Logica*. L. iii. c. 10, p. 179, ed 1677. Sanderson, *Logica*, L. ii. c. 7, p. 76, ed. 1741. Wallis, *Institutio Logicæ*, L. ii. c. 7, p 113, edit. 1729. Wallis also uses *pr. convertenda* as a synonym for *pr. conversa*. — Ed ]

[4] The term *exposition* (ἔκθεσις) is employed by Aristotle, and by most subsequent logicians, to denote the selection of an individual instance whose qualities may be perceived by sense (ἐκτιθέναι, *exponere, objicere sensui*), in order to prove a general relation between notions apprehended by the intellect. This method is used by Aristotle in proving the conversion of propositions and the reduction of syllogisms. See *Anal. Prior*. i. 2; i. 6; i. 8. The instance selected is called the *expositum*. (τὸ ἐκτεθέν); and hence singular propositions and syllogisms are called *expository*. Compare Pacius on *Anal. Pr.*, i. 2, and Sir W. Hamilton's note, *Reid's Works*, p. 696. — Ed.

Species of Conversion distinguished by logicians.

The logicians after Aristotle have distinguished two, or, as we may take it, three, or even four, species of Conversion.

1. The first, which is called *Simple* or *Pure Conversion* (*conversio simplex*, τοῖς ὅροις πρὸς ἑαυτήν, Aristotle, *i. e.*, *cum terminis reciprocatis*),[1] is when the quantity and quality of the two judgments are the same. It holds in Universal Negative and Particular Affirmative propositions.

2. The second, which is called *Conversion by Accident* (*c. per accidens*, ἐν μέρει, κατὰ μέρος, Aristotle), is when, the quality remaining unaltered, the quantity is reduced. It holds in Universal Affirmatives. These two are the species of the conversion of propositions acknowledged by all; they are evolved by Aristotle, not, as might have been expected, in his treatise *On Enouncement*, but in the second chapter of the first book of his *Prior Analytics*.[2]

3. The third, which is called *Conversion by Contraposition* (*c. per oppositionem*, *c. per contra positionem*, both by Boethius,[3] *contrapositio*, ἀντιστροφή σὺν ἀντιθέσει, Alexander),[4] is when, instead of the subject and predicate, the quantity and quality remaining the same, there is placed the contradictory of each. This holds in Universal Affirmatives, and most logicians allow it in Particular Negatives. It is commemorated by Aristotle in the eighth chapter of the second book of his *Topics*: it is there called the *inverse consecution from contradictions*.

Mnemonic verses expressing conversion

I shall here mention to you some mnemonic verses in which the doctrine of conversion is expressed.

1°. Regarding conversion as limited to the Simple and Accidental, and excluding altogether Contraposition, we have the doctrine contained in the two following verses.

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[1] Τοῖς ὅροις ἀντιστρέφειν, *Anal. Pr.*, i. 2, *i. e.*, when each term is the exact equivalent of the other. See Trendelenburg, *Elementa Log. Arist.*, § 11; *In De Anima*, p. 408; Waitz, *In Arist. Org.*, vol. i. p. 373. — Ed.

[2] [Boethius seems the first who gave the name of *Conversio per Accidens*. With him it is properly both Ampliative and Restrictive. (So Rüdiger, *De Sensu Veri et Falsi*, pp. 250, 293, 2d edit., 1722. Fischer *Logik*, p. 108.) It is opposed as a conspecies to *c. generalis*, and both are species of *c. simplex*, which is opposed to Contraposition. See *Opera*, *De Syllogismo Categorico*, L. i., p. 587. Thus *conversio* is divided primarily into *c. simplex* and *c. per contrapositionem*. Aristotle does not use ἐν μέρει, as subsequent logicians, for *c. diminuta*. He uses it mainly for *particular* in opposition to *universal*. (See *Anal: Prior*, i. 2, § 4.) They are thus wrong in their use of the words *accidental* and *partial*.]

[3] *Introductio ad Syllogismos Categorios*, and *De Syllogismo Categorico*, L. i. — Ed.

[4] *In Anal. Prior.*, f. 10 b, edit. Ald. 1520. — Ed.

E, I, simpliciter vertendo, signa manebunt;
Ast A cum vertis, signa minora cape.[1]

O is not convertible.

2°. Admitting Contraposition as a legitimate species of conversion, the whole doctrine is embodied in the following verses by Petrus Hispanus:

F E c I (F E s I) *simpliciter*, convertitur E v A (E p A) per *Accid.*
Ast O (A c O) per *Contrap.;* sic fit conversio tota.[2]

Or, to condense the three kinds of conversion with all the propositions, prejacent and subjacent, in a single line:

"Ecce, tibi, *Simp.;* Armi—geros, *Acc.;* Arma, bono, *Cont.*"[3]

Distinction of Propositions not strictly logical.

It may be proper now to make you acquainted with certain distinctions of judgments and propositions, which, though not strictly of a logical character, it is of importance that you should be aware of. "Considered in a material point of view, all judgments are, in the first place, distinguished into *Theoretical* and *Practical.* Theoretical are such as declare that a certain character belongs or does not belong to a certain object; *Practical*, such as declare that something can be or ought to be done, — brought to bear."

Theoretical and Practical.

"Theoretical, as well as practical judgments, are either *Indemonstrable*, when they are evident of themselves — when they do not require, and when they are incapable of proof: or they are *Demonstrable*, when they are not immediately apparent as true or false, but require some external reason to establish their truth or falsehood."

Indemonstrable and Demonstrable.

"Indemonstrable propositions are absolute principles (ἀρχαί, *principia*); that is, from which in the construction of a system of science, cognitions altogether certain not only are, but must be derived. Demonstrable propositions, on the other hand, can, at best, constitute only relative principles; that is, such as, themselves requiring a higher principle for their warrant, may yet afford the basis of sundry other propositions."

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[1] [Given by Chauvin, *Lex. Phil.*, v. *Conversio.* Denzinger, *Institutiones Logicæ*, ii. 140.]

[2] See Petrus Hispanus, p. 9, [*Summulæ*, Tract. i., partic. 4, f. 9, ed 1505. Cf. Petrus Tartaretus, *Expositio in Summulas Petri Hispani*, Tract. i., f. 9 b. — Ed.]

[3] [Hispanus, *Summulæ*, *l. c.* Chauvin, *l. c.*]

Axioms and Postulates.

"If the indemonstrable propositions be of a theoretical character, they are called *Axioms;* if of a practical character, *Postulates.* The former are principles of immediate certainty; the latter, principles of immediate application."

Theorems and Problems.

"Demonstrable propositions, if of a theoretical nature, are called *Theorems* (*theoremata*); if of a practical, *Problems* (*problemata*). The former, as propositions of a mediate certainty, require proof; they, therefore, consist of a *Thesis* and its *Demonstration;* the latter, as of mediate application, suppose a *Question* (*quæstio*) and its *Solution* (*resolutio*)."

Corollaries.

Experimental Propositions.

Hypotheses.

Lemmata.

Scholia.

"As species of the foregoing, there are, likewise, distinguished *Corollaries* (*consectaria*, *corollaria*), that is, propositions which flow, without a new proof, out of theorems or postulates previously demonstrated. Propositions whose validity rests on observation or experiment are called *Experiential*, *Experimental propositions* (*empiremata*, *experientiæ*, *experimenta*). *Hypotheses*, that is, propositions which are assumed with probability, in order to explain or prove something else which cannot otherwise be explained or proved. *Lemmata*, that is, propositions borrowed from another science, in order to serve as subsidiary propositions in the science of which we treat. Finally, *Scholia*, that is, propositions which only serve as illustrations of what is considered in chief. The clearest and most appropriate examples of these various kinds of propositions are given in mathematics."[1]

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[1] Esser, *Logic*, § 79, pp. 147, 148. — ED. [Compare Krug, *Logik*, §§ 67, 68.]

# LECTURE XV.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—THE DOCTRINE OF REASONINGS.

### REASONING IN GENERAL—SYLLOGISMS—THEIR DIVISIONS ACCORDING TO INTERNAL FORM.

In my last Lecture, I terminated the Doctrine of Judgments, and now proceed to that of Reasonings.

The act of reasoning — what

"When the necessity of the junction or separation of a certain subject-notion and a certain predicate notion is not manifest from the nature of these notions themselves; but when, at the same time, we are desirous of knowing whether they must be thought as inclusive, or as exclusive of each other,—in this case, we find ourselves in a state of doubt or indecision, from our ignorance of which of the two contradictory predicates must be affirmed or denied of the subject. But this doubt can be dissipated,—this ignorance can be removed, only in one way,—only by producing in us a necessity to connect with, or disconnect from, the subject one of the repugnant predicates. And since, *ex hypothesi*, this necessity does not—at least, does not immediately—arise from the simple knowledge of the subject in itself, or of the predicate in itself, or of both together in themselves, it follows that it must be derived from some external source,—and derived it can only be, if derived, from some other knowledge, which affords us, as its necessary consequence, the removal of the doubt originally harbored. But if this knowledge has for its necessary consequence the removal of the original doubt, this knowledge must stand to the existing doubt in the relation of a general rule; and, as every rule is a judgment, it will constitute a general proposition. But a general rule does not simply and of itself reach to the removal of doubt and indecision; there is required, and necessarily required, over and above this further knowledge — that the rule has really an application, or, what is the same thing, that the doubt really stands under the general proposition, as a case which can be decided by it as by a general rule. But when the general rule has been discovered, and when its application to the doubt has likewise been recognized, the solution of the doubt immediately follows, and therewith the determination of which of the contradictory predicates must or must not be affirmed of the subject; and this determination is accompanied with a consciousness of necessity or absolute certainty."[1] A simple example will place the matter in a clearer light. When the notion of the subject *man* is given along with the contradictory predicates *free agent* and *necessary agent*, there arises the doubt, with which of these contradictory predicates the subject is to be connected; for, as contradictory, they cannot both be affirmed of the subject, and, as contradictory, the one or the other must be so affirmed; in other words, I doubt whether *man* be a *free agent* or *not*. The notion *man*, and the repugnant notions *free agent* and *necessary agent*, do not, in themselves, afford a solution of the doubt; and I must endeavor to discover some other notion which will enable me to decide. Now, taking the predicate *free agent*, this leads me to the closely connected notion *morally responsible agent*, which, let it be supposed that I otherwise know to be necessarily a free agent, I thus obtain the proposition, *Every morally responsible agent is a free agent.* But this proposition does not of itself contain the solution of the doubt; for it may still be asked, Does the notion *morally responsible agent* constitute a predicate which appertains to the notion of *man*, the subject? This question is satisfied, if it is recognized that the notion *man* involves in it the notion of a *morally responsible agent.* I can then say, *Man is a morally responsible agent.* These two propositions being thus formed and applied to the subsisting doubt, the removal of this doubt follows of itself, and, in place of the previous indecision, whether man be a free agent or not, there follows, with the consciousness of necessity or absolute certainty, the connected judgment that *Man is also a free agent.* The whole process — the whole series of judgments — will stand thus:

Illustrated by an example

*Every morally responsible agent is a free agent;*
*Man is a morally responsible agent;*
*Therefore, man is a free agent.*

Let us consider in what relation the different constituent parts of this process stand to each other. It is evident that the whole process consists of three notions and their mutual relations. The three notions are, *free agent*, *responsible agent*, and *man*. Their mutual relations are all those of whole and part, and whole and part in the quantity of extension; for the notion *free agent* is seen to contain under it the notion *responsible agent*, and the notion *responsible agent* to contain under it the notion *man*. Thus, these three notions are like three circles of three various extensions severally, contained one within another; and it is evident, that the process by which we recognize that the narrowest notion, *man*, is contained under the widest notion, *responsible agent*, is precisely the same by which we should recognize the inmost circle to be contained in the outmost, if we were only supposed to know the relation of these together by their relation to the middle circle. Let A B C denote the three circles. Now, *ex hypothesi*, we know, and only know, that A contains B, and that B contains C; but as it is a self-evident principle, that a part of the part is a part of the whole, we cannot, with our knowledge that B contains C, and is contained in A, avoid recognizing that C is contained in A. This is precisely the case with the three notions—*free agent*, *responsible agent*, *man*; not knowing the relation between the notions *free agent* and *man*, but knowing that *free agent* contained under it *responsible agent*, and that *responsible agent* contained under it *man*, we, upon the principle that the part of a part is a part of the whole, are compelled to think, as a necessary consequence, that *free agent* contains under it *man*. It is thus evident, that the process shown in the example adduced is a mere recognition of the relation of three notions in the quantity of extension,—our knowledge of the relation of two of these notions to each other being not given immediately, but obtained through our knowledge of their relation to the third.

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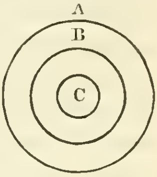
[1] Esser, *Logik*, § 82, p. 153.

The example given is a Reasoning in the whole of Extension, and may be represented by three circles.



But let us consider this process a little closer. The relations of the three notions, in the above example, are those given in the quantity of Breadth or Extension. But every notion has not only an Extensive, but likewise an Intensive, quantity,—not only a quantity in breadth, but a quantity in depth; and these two quantities stand to each other, as we have seen,[1] always in a determinate ratio,—the

The reasoning of Extension may be exhibited in Comprehension — this illustrated.

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[1] See above, p. 104. — ED.

ratio of inversion. It would, therefore, appear, *a priori*, to be a necessary presumption, that if notions bear a certain relation to each other in the one quantity, they must bear a counter relation to each other in the other quantity; consequently, that if we are able, under the quantity of extension, to deduce from the relations of two notions to a third their relation to each other, a correspondent evolution must be competent of the same notions, in the quantity of comprehension. Let us try whether this theoretical presumption be warranted *a posteriori*, and by experiment, and whether, in the example given, the process can be inverted, and the same result obtained with the same necessity. That example, as in extension, was:

*All responsible agents are free agents;*
*But man is a responsible agent;*
*Therefore, man is a free agent.*

In other words, — the notion *responsible agent* is contained under the notion *free agent;* but the notion *man* is contained under the notion *responsible agent;* therefore, on the principle that the part of a part is a part of the whole, the notion *man* is also contained under the notion *free agent.* Now, on the general doctrine of the relation of the two quantities, we must, if we would obtain the same result in the comprehensive which is here obtained under the extensive quantity, invert the whole process, that is, the notions which in extension are wholes become in comprehension parts, and the notions which in the former are parts, become in the latter wholes. Thus the notion *free agent*, which, in the example given, was the greatest whole, becomes, in the counter process, the smallest part, and the notion *man*, which was the smallest part, now becomes the greatest whole. The notion *responsible agent* remains the middle quantity or notion in both, but its relation to the two other notions is reversed; what was formerly its part being now its whole, what was formerly its whole being now its part. The process will, therefore, be thus explicitly enounced:

*The notion man comprehends in it the notion responsible agent;*
*But the notion responsible agent comprehends in it the notion free agent;*
*Therefore, on the principle that the part of a part is a part of the whole, the notion man also comprehends in it the notion free agent.*

Or, in common language:

*Man is a responsible agent;*
*But a responsible agent is a free agent;*
*Therefore, man is a free agent.*

This reversed process, in the quantity of comprehension, gives, it is evident, the same result as it gave in the quantity of extension. For, on the supposition, that we did not immediately know that the notion *man* comprehended *free agent*, but recognized that *man* comprehended *responsible agent*, and that *responsible agent* comprehended *free agent*, we necessarily are compelled to think, in the event of this recognition, that the notion *man* comprehends the notion *free agent*.

The copula in extension and comprehension of a counter meaning.

It is only necessary further to observe, that in the one process, — that, to wit, in extension, the copula *is*, means *is contained under*, whereas, in the other, it means *comprehends in*. Thus the proposition, — *God is merciful*, viewed as in the one quantity, signifies *God is contained under merciful*, that is, the notion *God* is contained under the notion *merciful;* viewed as in the other, means, — *God comprehends merciful*, that is, the notion *God comprehends in it* the notion *merciful*.

Now, this process of thought (of which I have endeavored to give you a general notion) is called *Reasoning;* but it has, likewise, obtained a variety of other designations. The definition of this process, with its principal denominations, I shall include in the following paragraph.

**Par. LIII. Definition of the process of Reasoning, with the principal denominations of process and product.**

¶ LIII. — Reasoning is an act of mediate comparison or Judgment; for to reason is to recognize that two notions stand to each other in the relation of a whole and its parts, through a recognition, that these notions severally stand in the same relation to a third. Considered as an act, Reasoning, or Discourse of Reason (τὸ λογίζεσθαι, λογισμός, διάνοια, τὸ διανοεῖσθαι), is, likewise, called the act or process of *Argumentation* (*argumentationis*), of *Ratiocination* (*ratiocinationis*), of *Inference* or *Illation* (*inferendi*), of *Collecting* (*colligendi*), of *Concluding* (*concludendi*), of *Syllogising* (τοῦ συλλογίζεσθαι, barbarously *syllogisandi*). The term *Reasoning* is, likewise, given to the product of the act; and a reasoning in this sense (*ratiocinatio*, *ratiocinium*), is, likewise, called an *Argumentation* (*argumentatio*); also, frequently, an *Argument* (*argumentum*), an *Inference* or *Illation* (*illatio*); a *Collection* (*collectio*), a *Conclusion* (*conclusio*, συμπέρασμα); and, finally, a *Syllogism* (συλλογισμὸς).

Explication.

A few words in explanation of these will suffice; and, first, of the thing and its definition, thereafter of its names.

1. The Act of Reasoning

In regard to the act of Reasoning, nothing can be more erroneous than the ordinary distinction of this process, as the operation of a faculty different in kind from those of Judgment and Conception. Conception, Judgment, and Reasoning, are in reality only various applications of the same simple faculty, that of Comparison or Judgment. I have endeavored to show that concepts are merely the results, rendered permanent by language, of a previous process of comparison; that judgment is nothing but comparison, or the results of comparison, in its immediate or simpler form; and, finally, that reasoning is nothing but comparison in its mediate or more complex application.[1] It is, therefore, altogether erroneous to maintain, as is commonly done, that a reasoning or syllogism is a mere decompound whole, made up of judgments; as a judgment is a compound whole, made up of concepts. This is a mere mechanical mode of cleaving the mental phenomena into parts; and holds the same relation to a genuine analysis of mind which the act of the butcher does to that of the anatomist. It is true, indeed, that a syllogism can be separated into three parts or propositions; and that these propositions have a certain meaning, when considered apart, and out of relation to each other. But, when thus considered, they lose the whole significance which they had when united in a reasoning; for their whole significance consisted in their reciprocal relation, — in the light which they mutually reflected on each other. We can certainly hew down an animal body into parts, and consider its members apart; but these, though not absolutely void of all meaning, when viewed singly and out of relation to their whole, have lost the principal and peculiar significance which they possessed as the coëfficients of a one organic and indivisible whole. It is the same with a syllogism. The parts which, in their organic union, possessed life and importance, when separated from each other remain only enunciations of vague generalities, or of futile identities. Though, when expressed in language, it be necessary to analyze a reasoning into parts, and to state these parts one after another, it is not to be supposed that in thought one notion, one proposition, is known before or after another; for, in consciousness, the three notions and their reciprocal relations constitute only one identical and simultaneous cognition.

A reasoning is one organic whole.

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[1] See above, pp. 83, 97. — ED.

Error of logicians in their treatment of the Syllogism.

The logicians have indeed all treated the syllogism as if this were not the case. They have considered one proposition as naturally the last in expression, and this they have accordingly called the *conclusion;* whilst the other two, as naturally going before the other two, they have styled the *premises*, forming together what they call the *antecedent.* The two premises they have also considered as the one the greater (*major*), the other the less (*minor*), by exclusive reference to the one quantity of extension. All this, however, is, in my view, completely erroneous. For we may, in the theory of Logic, as we actually do in its practical applications, indifferently enounce what is called the *conclusion* first or last. In the latter case, the conclusion forms a thesis, and the premises its grounds or reasons; and instead of the inferential *therefore* (*ergo*, ἄρα), we would employ the explicative *for.* The whole difference consists in this, — that the common order is synthetic, the other analytic; and as, to express the thought, we must analyze it, the analytic order of statement appears certainly the most direct and natural.[1] On the subordinate matter of the order of the premises, I do not here touch.

Utility of the process of reasoning.

But to speak of the process in general: — without the power of reasoning we should have been limited in our knowledge (if knowledge of such a limitation would deserve the name of knowledge at all), — I say without reasoning we should have been limited to a knowledge of what is given by immediate intuition; we should have been unable to draw any inference from this knowledge, and have been shut out from the discovery of that countless multitude of truths, which, though of high, of paramount importance, are not self-evident. This faculty is, likewise, of peculiar utility, in order to protect us, in our cogitations, from error and falsehood, and to remove these if they have already crept in. For every, the most complex, web of thought may be reduced to simple syllogisms; and when this is done, their truth or falsehood, at least in a logical relation, flashes at once into view.

2. Terms by which the process of Reasoning is denominated.

Reasoning. Ratiocination.

Of the terms by which this process is denominated, *Reasoning* is a modification from the French *raisonner* (and this a derivation from the Latin *ratio*), and corresponds to *ratiocinatio*, which has indeed been immediately transferred into our language under the form *ratiocination*. *Ratiocination* denotes properly the process, but, improperly, also the product of reasoning; *Ratiocinium* marks exclusively the product. The original meaning of *ratio* was *computation*, and, from the calculation of numbers, it was transferred to the process of mediate comparison in general.

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[1] Aristotle's *Analytics* are synthetic.

Discourse.

*Discourse* (*discursus*, διάνοια) indicates the operation of comparison, the running backwards and forwards between the characters or notes of objects — (*discurrere inter notas*, διανοεῖσθαι): this term may, therefore, be properly applied to the Elaborative Faculty in general, which I have just called the Discursive. The terms *discourse* and *discursus*, διάνοια, are, however, often, nay generally, used for the reasoning process, strictly considered, and *discursive* is even applied to denote mediate, in opposition to intuitive, judgment, as is done by Milton.[1] The compound term, *discourse of reason*[2] unambiguously marks its employment in this sense.

Argumentation.
Argument.

*Argumentation* is derived from *argumentari*, which means *argumentis uti*; *argument* again, *argumentum*, — what is assumed in order to argue something, — is properly the middle notion in a reasoning, — that through which the conclusion is established; and by the Latin Rhetoricians it was defined, — "probabile inventum ad faciendam fidem."[3] It is often, however, applied as coëxtensive with *argumentation*.

Inference.

*Inference* or *illation* (from *infero*), indicates the carrying out into the last proposition what was virtually contained in the antecedent judgments.

To conclude.

*To conclude* (*concludere*), again, signifies the act of connecting and shutting into the last proposition the two notions which stood apart in the two first.

Conclusion.

A *conclusion (conclusio)* is usually taken, in its strict or proper signification, to mean the last proposition of a reasoning; it is sometimes, however, used to express the product of the whole process.

To Syllogize.
Syllogism.

*To syllogize* means to form syllogisms. *Syllogism* (συλλογισμὸς) seems originally, like *ratio*, to have denoted a *computation* — an *adding up* — and, like the greater part of the technical terms of Logic in general, was borrowed by Aristotle from the mathematicians.[4] This primary meaning of these two words favors the theory of those philosophers who, like Hobbes[1] and Leidenfrost,[2] maintain that all thought is, in fact, at bottom only a calculation, a reckoning. Συλλογισμὸς may, however, be considered as expressing only what the composition of the word denotes, — *a collecting together;* for συλλογίζεσθαι comes from συλλέγειν, which signifies *to collect.*[3] Finally, in Latin, a syllogism is called *collectio*, and to reason *colligere*. This refers to the act of collecting, in the conclusion, the two notions scattered in the premises.

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[1] *Paradise Lost*, v. 486, —

> "Whence the soul
> Reason receives, and reason is her being,
> Discursive or intuitive; discourse
> Is oftest yours." — Ed.

[2] Shakspeare, *Hamlet*, act 1, sc. 2, —

> "——A beast, that wants discourse of reason,
> Would have mourned longer."

Hooker, *E. P.*, iii. 8, 18 — "By discourse of reason, aided with the influence of divine grace." — Ed.

[3] Cicero, *Oratoriæ Partitiones*, c 2. Cf. *Discussions*, p. 119. — Ed.

[4] [See Piccartus, *Org. Arist.*, pp 467, 468. Ammonius, *In Quinque Voces*, f 1 Philoponus, *In An. Prior*, f. $17^b$. Pacius, *Com. in Org.*, pp. 118, 122. Bertius, *Log. Perip.* p. 119. But see Waitz, *Organon* I. p. 384 [Schulze, *Logik*, § 70, p. 101. *Discussions*, p 667, note. — Ed.]

Collectio.

The general conditions of syllogism.

"From what has already been said touching the character of the reasoning process, it is easy to see what are the general conditions which every syllogism supposes. For, as the essential nature of reasoning consists in this, — that some doubt should be removed by the application to it of some decisive general rule, there are to every syllogism three, and only three, requisites necessary; 1°, A doubt, — which of two contradictory predicates must be affirmed of a certain subject, — the problem or question (problema, quæsitum); 2°, The application of a decisive general rule to the doubt; and, 3°, The general rule itself. But these requisites, when the syllogism is constructed and expressed, change their places; so that the general rule stands first, the application of it to the doubt stands second, and the decision in regard to the doubt itself stands last. Each of these necessary constituents of a syllogism forms by itself a distinct, though a correlative, proposition; every syllogism, therefore, contains three propositions, and these three propositions, in their complement and correlation, constitute the syllogism."[4] It will be proper, however, here to dictate a paragraph, expressive of the denominations technically given to the parts, which proximately make up the syllogism.

> ¶ LIV. A Reasoning or Syllogism is composed of two parts, — that which determines or precedes, and that which follows or is determined. The one is called the *Antecedent* (*antecedens*); the other, the *Consequent* (*consequens*). The Antecedent comprises the two propositions, the one of which

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[1] *Leviathan*, Pt. I. c. 5; *Computatio sive Logica*, c. 1. Cf. Stewart, *Elements*, P. ii. c. ii. § 3; *Works*, vol. iii. p. 132 *et seq.* — Ed.

[2] *De Mente Humana*, c. viii. §§ 4, 10, pp 112, 118, ed. 1793. — Ed

[3] Eugenios, Λογικὴ, p. 405. et ibi Blemmidas [Καὶ τὸ μὲν ὄνομα, ὅτι συλλογή τις ἐστὶ λόγων πλειόνων ἐν αὐτῷ . . . Ὁ δὲ Βλεμμίδ. ἐν Ἐπιτομ. Λογ. κεφ. λά, "Ποτὲ δὲ καὶ αὐτὸ τὸ συμπέρασμα καλεῖται (φησὶ) συλλογισμός . . . ὡς συλλέγον τὴν ἐν πᾶσι τοῖς ὅροις διεσπαρμενην ἀπόδειξιν." Cf. Zabarella, *In Anal. Post.*, l. 1, *Opera Logica*, p. 640. Συλλογισμὸς, non συλλογὴ τῶν λόγων, sed quasi συλλογὴ τοῦ λόγου, *collectio rationis:* ratio autem colligi dicitur, dum conclusio infertur; quare a conclusione potius, quam a propositionibus dictus est syllogismus." — Ed.]

[4] Esser, *Logik*, § 83, p. 156.

Par. LIV. Denominations of the parts which proximately make up the syllogism.

enounces the general rule, and the other its application. These, from their naturally preceding the consequent, are called the *Premises* (*propositiones præmissæ*, *sumptiones*, *membra antecedentia*, λήμματα). Of the premises, the one which enounces the general rule, or the relation of the greatest quantity to the lesser, is called the *Major Premise*, or *Major Proposition*, or the *Proposition* simply (*propositio major*, *propositio prima*, *propositio*, *sumptum*, *sumptio major*, *sumptio*, *thesis*, *expositio*, *intentio*, πρόσληψις, πρότασις ἡ μείζων, λῆμμα τὸ μεῖζον). The other premise, which enounces the application of the general rule, or the relation of the lesser quantity to the least, is called the *Minor Premise*, the *Minor Proposition*, the *Assumption*, or the *Subsumption* (*propositio minor*, *propositio altera*, *assumptio*, *subsumptum*, *subsumptio*, *sumptio minor*, πρότασις ἡ ἐλάττων, λῆμμα τὸ ἔλαττον). It is manifest that, in the counter qualities of Breadth and Depth, the two premises will hold an opposite relation of major and minor, of rule and application. The Consequent is the final proposition, which enounces the decision, or the relation of the greatest quantity to the least, and is called the *Conclusion* (*conclusio*, *conclusum*, *propositio conclusa*, *collectio*, *complexio*, *summa*, *connexio*, *illatio*, *intentio*, and, in Greek, συμπέρασμα, τὸ συναγόμενον,[1] τὸ ἐπιφερόμενον). This part is usually designated by the conjunction *Therefore* (*ergo*, ἄρα), and its synonyms. The conclusion is the *Problem* (*problema*), *Question* (*quæstio*, *quæsitum*), which was originally asked, stated now as a decision.[2] The problem is usually omitted in the expression of a syllogism, but is one of its essential parts. The whole nomenclature of the syllogistic parts, be it observed, has reference to the one-sided views of the logicians in regard to the process of reasoning.[3]

Explication.
Antecedent and Consequent.

The Syllogism is divided into two parts, the Antecedent and the Consequent: — the antecedent comprehending the two propositions, in which the middle notion is compared with the two notions we would compare together; and the consequent comprising the one proposition, which explicitly enounces the relation implicitly given in the prior of these two notions to each other.

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[1] [Eugenios, Λογικὴ *passim*.]

[2] [See Alex. Aphrodisiensis, *In Anal. Prior.*, c. 4, f. $17^b$. Boethius, *In Topica Ciceronis*, l. i., *Opera*, p. 764.]

[3] [See R. Agricola, *De Inventione Dialecticæ*, L. ii. c. xiv. pp. 401, 417, 420. Vives, *Opera* [t. i., *De Censura Veri*, L. ii. p. 606 *et seq.*, ed. 1555. — Ed.] Bachmann, *Logik*, p. 184. Facciolati, Sextus Empiricus. [Facciolati, *Rudimenta Logica*, c. iii. p. 83, ed. 1750. Sextus Empiricus, *Hypotyposes*, L. ii. p. 86 *et alibi*. — Ed.]

Premises.

The two propositions which constitute the antecedent are called, among other names, the *Premises*. Of these, the proposition expressing the relation of whole, which one of the originally given notions holds to the assumed or middle notion as its part, is called, among other appellations, the *Major Proposition*, the *Major Premise*, or *The Proposition*, κατ' ἐξόχην.

Major.

The other proposition of the antecedent enouncing the relation of whole, which the assumed or middle notion holds to the other of the given notions as its part is called, among other appellations, the *Minor Proposition*, the *Minor Premise*, the *Assumption*, or the *Subsumption*.

Minor.

These, as terms of relation, vary, of course, with the relation in the counter quantities. The one proposition, which constitutes the consequent, is called, among other appellations, the *Conclusion*.

Sumption, Subsumption, and Conclusion.

Perhaps the best names for these three relative propositions of a syllogism would be *Sumption*, *Subsumption*, *Conclusion*, as those which express, most briefly and naturally, the nature and reciprocal dependence of the three judgments of a syllogism.

Grounds of their adoption as best names for the three propositions of a syllogism.

In the first place, the expressions *Sumption* and *Subsumption* are appropriate logical expressions, in consequence of their both showing that Logic considers them, not as absolutely, but only as hypothetically true; for Logic does not warrant the truth of the premises of a syllogism; it only, on the supposition that these premises are true, guarantees the legitimacy of the inference, — the necessity of the conclusion.

Lemma.

It is on this account that the premises have, by the Greek logicians, been very properly styled λήμματα,[1] corresponding to the Latin *sumptiones*; and were there any necessity to resort to Greek, the Major Proposition, which I would call *Sumption* (*sumptio*), might be well denominated *Lemma* simply; and the Minor Proposition, which I would call the *Subsumption* (*subsumptio*), might be well denominated the *Hypolemma*.

Hypolemma.

In the second place, though both premises are sumptions, or lemmata, yet the term *sumption*, as specially applied to the Major Premise, is fully warranted both by precedent and principle. For, in like manner, the major proposition — the major lemma — has always obtained both from the Greek and Latin logicians the generic term; it has been called, *The Proposition*, *The Lemma* (*propositio*, ἡ πρότασις, τὸ λῆμμα); and as this is the judgment which includes and allows both the others, it is well entitled, as the principal proposition, to the style and title of *the proposition*, *the lemma*, *the sumption* by preëminence. In the third place, the term *subsumption* is preferable to the term *assumption*, as a denomination of the Minor Premise; for the term *subsumption* precisely marks out its relation of subordination to the major premise, whereas the term *assumption* does not. *Assumption* would indeed, in contrast to *subsumption*, have been an unexceptionable word by which to designate the major proposition, had it not been that logicians have very generally employed it to designate the minor, so that to reverse its application would be productive of inevitable confusion. But for this objection, I should certainly have preferred the term *assumption* to that of *sumption*, for the appellation of the major proposition; not that in itself it is a preferable expression, but simply because *assumption* is a word of familiar usage in the English language, which *sumption* and *subsumption* certainly are not.

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[1] See Alexander, *In Anal. Prior.*, f. 14, b. *Scholia*, ed. Brandis, p. 150. — Ed.

Assumption

Objections to the denominations of the Propositions of the syllogism in ordinary use

Major Proposition and Premise. Minor Proposition and Premise.

The preceding are reasons why the relative terms *sumption* and *subsumption* ought to be employed, as being positively good expressions; but the expediency of their adoption becomes still more manifest, when they are compared and contrasted with corresponding denominations in ordinary use. For the terms *major proposition* and *major premise*, *minor proposition* and *minor premise*, are exposed to various objections. In the first place, they are complex and tedious expressions, whereas *sumption* and *subsumption* are simple and direct. In the second place, the abbreviations in common use (the major proposition being called the *major*, the minor proposition being called the *minor*) are ambiguous, not only in consequence of their vagueness in general, but because there are two other parts of the syllogism to which these expressions, *major* and *minor*, may equally apply. For, as you will soon be informed, the two notions which we compare together through a third, are called the *major* and the *minor terms* of the syllogism; so that when we talk of majors and minors in reference to a syllogism, it remains uncertain whether we employ these words to denote the propositions or the terms of a reasoning. Still more objectionable are the correlative terms, *Proposition* and *Assumption*, as synonyms for the major and minor premises. The term *proposition* is a word in too constant employment in its vague and general sense, to be unambiguously used in a signification so precise and special as the one in question; and, in consequence of this ambiguity, its employment in this signification has been in fact long very generally abandoned. Again, the term *assumption* does not express the distinctive peculiarity of the minor premise, — that of being a subordinate proposition, — a proposition taken or assumed under another; this word would indeed, as I have noticed, have been applied with far greater propriety, had it been used to denote the major in place of the minor premise of a syllogism.

Proposition. Assumption.

The use of *Sumption* and *Subsumption* sanctioned by precedent.

These are among the reasons which have inclined me to employ, at least along with the more ordinary denominations, the terms *sumption* and *subsumption*. Nor is it to be supposed, that this usage is destitute of precedent, for I could adduce in its favor even the high authority of Boethius.[1] In general and without reference to Logic, it appears marvellous how, in English philosophy, we could so long do without the noun *subsumption*, and the verb *to subsume*, for these denote a relation which we have very frequently occasion to express, and to express which there are no other terms within our reach. We have already in English *assumption* and *assume*, *presumption* and *presume*, *consumption* and *consume*, and there is no imaginable reason why we should not likewise enrich the language, to say nothing of *sumption*, by the analogous expressions *subsumption* and *subsume*.

The Conclusion.

In regard to the proposition constituting the consequent of a syllogism, the name which is generally bestowed on it, — the *Conclusion*, — is not exposed to any serious objections. There is thus no reason why it should be superseded, and there is in fact no other term entitled to a preference. So much in reference to the terms by which the proximate parts of a syllogism are denoted. I now proceed to state to you in general the Division of Syllogisms into Species determined by these parts, and shall then proceed to consider these several species in detail. But I have first of all to state to you a division of Syllogisms, which, as comprehending, ought to precede all others. It is that of Syllogisms into Extensive and Comprehensive.

¶ LV. The First Division of Syllogisms is taken from the different kinds of quantity under which the reasoning proceeds.

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[1] "Quoniam enim omnis syllogismus ex propositionibus texitur, prima vel propositio, vel *sumptum* vocatur; secunda vero *assumptio*." Boethius, *De Syllogismo Hypothetico*, lib i — ED.

Par. LV. First Division of Syllogisms into Extensive and Comprehensive.

For while every syllogism infers that the part of a part is a part of the whole, it does this either in the quantity of Extension, — the Predicate of the two notions compared in the Question and Conclusion being the greatest whole, and the Subject the smallest part; or in the counter quantity of Comprehension, — the Subject of these two notions being the greatest whole, and the Predicate the smallest part.

After what I have already stated in regard to the nature of these opposite quantities, under the doctrine of Concepts and Judgments,[1] and after the illustrations I have given you of the possibility of conducting any reasoning in either of these quantities at will,[2] — every syllogism in the one quantity being convertible into a syllogism absolutely equivalent in the other quantity, — it will be here needless to enlarge upon the nature of this distinction in general. This distinction comprehends all others; and its illustration, therefore, supposes that the nature of the various subordinate classes of syllogisms should be previously understood. It will, therefore, be expedient, not at present to enter on any distinct consideration of this division of reasonings, but to show, when treating of syllogisms under their various subaltern classes, how each is capable of being cast in the mould of either quantity, and not, as logicians suppose, in that of extensive quantity alone.

Matter and form of syllogisms.

The next distinction of Syllogisms is to be sought for either in the constituent elements of which they are composed, or in the manner in which these are connected. The former of these is technically called the *matter* of a syllogism, the latter its *form*. You must, however, observe that these terms are here used in a restricted meaning. Both matter and form under this distinction are included in the form of a syllogism, when we speak of form in contrast to the empirical matter which it may contain. This, therefore, is a distinction under that form with which Logic, as you know, is exclusively conversant; and the matter here spoken of should be called, for distinction's sake, the *formal or necessary matter* of a syllogism. In this sense, then, the matter of a syllogism means merely the propositions and terms of which every syllogism is necessarily made up;[3] whereas, otherwise, the form of a syllogism points out the way in which these constituents are connected.[1] This being understood, I repeat that the next distinction of syllogisms is to be sought for either in their matter or in their form.

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[1] See above, p. 100 *et seq.* — ED.

[2] See above, p. 192 *et seq.* — ED.

[3] Proximate and remote matter. *Marginal Jotting.* [See Hurtado de Mendoza, *Disput. Phil.*, *Disp. Logicæ*, t. I. d. x. § 48, p. 465. "Materia (syllogismi) alia est proxima, alia remota. Remota sunt termini propositionum, proxima vero sunt propositiones ipsæ, quibus coalescit syllogismus." — ED.]

Their form, the ground of the next grand distinction of syllogisms.

"Now in regard to their matter, syllogisms cannot differ, for every syllogism, without exception, requires the same constituent parts, — a question, the subsumption of it under a general rule, and the sumption of the general rule itself; which three constituents, in the actual enunciation of a syllogism, change, as I have already noticed, their relative situation;[2] — what was first in the order of thought being last in the order of expression.

The form of Syllogism twofold, internal and External.

"The difference of Syllogisms can, therefore, only be sought for in their different forms; so that their distinctions are only formal. But the form of a syllogism, considered in its greatest generality, is of a twofold kind, viz., either an Internal and Essential, or an External and Accidental. The former of these depends on the relations of the constituent parts of the syllogism to each other, as determined by the nature of the thinking subject itself; the latter of these depends on the external expression of the constituent parts of the syllogism, whereby the terms and propositions are variously determined in point of number, position, and consecution. We must, therefore, in conformity to the order of nature, first of all, consider what classes of syllogism are given by their internal or essential form; and thereafter inquire what are the classes afforded by their external or accidental modifications. First, then, in regard to the Internal or Essential Form of Syllogism.

"A Syllogism is only a syllogism when the conclusion follows from the premises with an absolute certainty; and as this certainty is determined by a universal and necessary law of thought, there must, consequently, be as many kinds of Syllogism as there are various kinds of premises affording a consequence in virtue of a different law. Between the premises there is only one possible order of dependency, for it is always the sumption, — the major premise, which, as the foundation of the whole syllogism, must first be taken into account. And in determining the difference of syllogisms, the sumption is the only premise which can be taken into account as affording a difference of syllogism; for the minor premise is merely the subsumption of the lesser quantity of the two notions, concerning whose relation we inquire, under the question, and this premise always appears in one and the same form, — in that, namely, of a categorical proposition. The same is, likewise, the case in regard to the conclusion, and, therefore, we can no more look towards the conclusion for a determination of the diversity of syllogism than towards the subsumption. We have thus only to inquire in regard to the various possible kinds of major proposition."[1]

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[1] Krug, *Logik*, § 72, Anm., i. — Ed. [Cf. Fries, *Logik*, § 44.]

[2] Esser, *Logic*, § 85, p 159. — Ed.

Syllogisms to be divided according to the character of their sumptions and the law regulating the connection between premises and conclusion.

Now as all sumptions are judgments, and as we have already found that the most general division of judgments, next to the primary distinction of intensive and extensive, is into simple and conditional, this division of judgments, which, when developed, affords the classes of categorical, disjunctive, hypothetical, and hypothetico-disjunctive propositions, will furnish us with all the possible differences of major premises. "It is also manifest that in any of these aforesaid propositions, — (categorical, disjunctive, hypothetical, and hypothetico-disjunctive), — a decision of the question, — which of two repugnant predicates belongs to a certain subject, — can be obtained according to a universal and necessary law. In a categorical sumption, this is competent through the laws of Identity and Contradiction; for what belongs or does not belong to the superordinate notion, belongs or does not belong to the subordinate. In disjunctive sumptions, this is competent through the law of Excluded Middle; since of all the opposite determinations one alone belongs to the object; so that if one is affirmed, the others must be, conjunctively, denied: and if one is denied, the others must be, disjunctively at least, affirmed. In hypothetical sumptions, this is competent through the law of Reason and Consequent; for where the reason is, there must be the consequent, and where the consequent is, there must be the reason."[2] There are thus obtained three or four great classes of Syllogisms, whose essential characteristics I shall comprise in the following paragraph:

¶ LVI. Syllogisms are divided into different classes, according as the connection between the premises and conclusion is

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[1] Esser, *Logik*, § 85. — Ed.

[2] See Esser, *Logik*, § 86, p. 161. This classification of syllogisms cannot be regarded as expressing the author's final view; according to which, as before observed, the principle of Reason and Consequent is not admitted as a law of thought. See above, p. 62, note 1. In a note by Sir W. Hamilton, appended to Mr. Baynes's *Essay on the New Analytic of Logical Forms*, the author's later view is expressed as follows: "All *Mediate* inference is one — that incorrectly called *Categorical*; for the *Conjunctive* and *Disjunctive* forms of *Hypothetical* reasoning are reducible to immediate inferences." Compare *Discussions*, p. 651 *seq.* — Ed.

Par. LVI. Second grand division of Syllogisms — according to the law regulating the inference.

determined by the different fundamental laws, 1°, of Identity and Contradiction; 2°, Of Excluded Middle; 3°, Of Reason and Consequent; these several determinations affording the three classes of *Categorical*, of *Disjunctive*, and of *Hypothetical Syllogisms*. To these may be added a fourth class, the *Hypothetico-disjunctive* or *Dilemmatic Syllogism*, which is determined by the two last laws in combination.

Examples of the four species of syllogism.

Before proceeding to a consideration of these several syllogisms in detail, I shall, first of all, give you examples of the four species together, in order that you may have, while treating of each, at least a general notion of their differences and similarity.

1 Categorical.

### 1.—Of a Categorical Syllogism.

Sumption, . . . . . . . *All matter is created :*
Subsumption, . . . . *But the heavenly bodies are material ;*
Conclusion, . . . . . . *Therefore, the heavenly bodies are created.*

2. Disjunctive.

### 2.—Of a Disjunctive Syllogism.

Sumption, . . . . . *The hope of immortality is either a rational expectation or an illusion ;*
Subsumption, . . . *But the hope of immortality is a rational expectation ;*
Conclusion, . . . . *Therefore, the hope of immortality is not an illusion.*

3 Hypothetical.

### 3.—Of an Hypothetical Syllogism.

Sumption, . . . . . *If Logic does not profess to be an instrument of invention, the reproach that it discovers nothing is unfounded ;*
Subsumption, . . . *But Logic does not profess to be an instrument of invention ;*
Conclusion, . . . . *Therefore, the reproach that it discovers nothing is unfounded.*

4 Hypothetico-disjunctive.

### 4.—Of the Dilemma or Hypothetico-disjunctive Syllogism.

Sumption, . . . . . *If man were suited to live out of society, he would either be a god or a beast ;*
Subsumption, . . . *But man is neither a god nor a beast ;*
Conclusion, . . . . *Therefore, he is not suited to live out of society.*

# LECTURE XVI.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO INTERNAL FORM.

### A. SIMPLE.—CATEGORICAL.—I. DEDUCTIVE IN EXTENSION.

Recapitulation.

IN our last Lecture, I entered on the Division of Syllogisms. I first stated to you the principles on which this division must proceed; I then explained the nature of the first great distribution of Reasonings into those of Intensive and those of Extensive Quantity; and, thereafter, that of the second great distribution of reasonings into Simple and Conditional, the Simple containing a single species, — the Categorical; the Conditional comprising three species,— the Disjunctive, the Hypothetical, and Hypothetico-disjunctive.[1] These four species I showed you, were severally determined by different fundamental Laws of Thought: the Categorical reposing on the laws of Identity and Contradiction; the Disjunctive on the law of Excluded Middle; the Hypothetical on the law of Reason and Consequent; and the Hypothetico-disjunctive on the laws of Excluded Middle and Reason and Consequent in combination.

I. Simple Syllogism. The Categorical.

I now go on to the special consideration of the first of these classes of Syllogism — viz., the Syllogism which has been denominated *Categorical*. And in regard to the meaning and history of the term *categorical*, it will not be necessary to say anything in addition to what

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[1] Compare above, p. 167. ED.

I have already stated in speaking of judgments.[1] As used originally by Aristotle, the term *categorical* meant merely *affirmative*, and was opposed to *negative*. By Theophrastus it was employed in the sense absolute, —simple,— direct, and as opposed to *conditional ;* and in this signification it has continued to be employed by all subsequent logicians, without their having been aware that Aristotle never employed it in the meaning in which alone they used it.

The term *Categorical.*

Par. LVII. The Categorical Syllogism,—what.

¶ LVII. A Categorical Syllogism is a reasoning whose form is determined by the laws of Identity and Contradiction, and whose sumption is thus a categorical proposition. In a Categorical Syllogism there are three principal notions, holding to each other the relation of whole and part ; and these are so combined together, that they constitute three propositions, in which each principal notion occurs twice. These notions are called *Terms* (*termini*, ὅροι), and according as the notion is the greatest, the greater, or the least, it is called the *Major*, the *Middle*, or the *Minor Term.*[2] The Middle Term is called the *Argument* (*argumentum*, λόγος, πίστις); the Major and Minor Terms are called *Extremes* (*extrema*, ἄκρα). If the syllogism proceed in the quantity of Extension (and this form alone has been considered by logicians), the predicate of the conclusion is the greatest whole, and, consequently, the Major Term; the subject of the conclusion, the smallest part, and, consequently, the Minor Term. If the syllogism proceed in the quantity of Comprehension, the subject of the conclusion is the greatest whole, and, consequently, the Major Term; the predicate of the conclusion, the smallest part, and, consequently, the Minor Term. In either quantity, the proposition in which the relation of the major term to the middle is expressed, is the *Sumption* or *Major Premise*, and the proposition in which is expressed the relation of the middle term to the minor, is the *Subsumption* or *Minor Premise.* The general forms of a Categorical Syllogism under the two quantities, are, consequently, the following:

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[1] See above, p. 165 *et seq.* — Ed.

[2] [On principle of name of Major and Minor terms, see Alex. Aphrodisiensis, *In An. Prior.*, L. i. cc. iv. v. Philoponus, *In An. Prior.*, L. i. f. 23 b. Fonseca, *Instit. Dialect.*, L. vi. c. xii. p. 343. Hurtado de Mendoza, p 469.] [*Disput. Philosophicæ*, t. i.; *Disp. Logicæ*, d. x. § 50 *et seq.* Tolosæ, 1617. See also *Discussions*, p. 666 *et seq.* — Ed.]

| AN EXTENSIVE SYLLOGISM | AN INTENSIVE SYLLOGISM. |
|---|---|
| B *is* A | C *is* B |
| C *is* B | B *is* A |
| C *is* A | C *is* A |
| *All man is mortal;* | *Caius is a man;* |
| *But Caius is a man;* | *But all man is mortal;* |
| *Therefore, Caius is mortal.* | *Therefore, Caius is mortal.* |

Explication.

In these examples, you are aware, from what has previously been said,[1] that the copula in the two different quantities is precisely of a counter meaning; in the quantity of extension, signifying *contained under;* in the quantity of comprehension, signifying *contains in it.* Thus, taking the several formulæ, the Extensive Syllogism will, when explicitly enounced, be as follows:

Example of the Extensive Categorical Syllogism.

*The Middle term* B *is contained under the Major term* A;
*But the Minor term* C *is contained under the Middle term* B;
*Therefore, the Minor term* C *is also contained under the Major term* A.

Or, to take the concrete example:

*The Middle term all men is contained under the Major term mortal;*
*But the Minor term Caius is contained under the Middle term all men;*
*Therefore, the Minor term Caius is also contained under the Major term mortal.*

Of the Intensive.

On the contrary the Intensive Syllogism, when explicated, is as follows:

*The Major term* C *contains in it the Middle term* B;
*But the Middle term* B *contains in it the Minor term* A;
*Therefore, the Major term* C *also contains in it the Minor term* A.

Or, in the concrete example:

*The Major term Caius contains in it the Middle term man,*
*But the Middle term man contains in it the Minor term mortal;*
*Therefore, the Major term Caius also contains in it the Minor term mortal.*

Thus you see that by reversing the order of the two premises, and by reversing the meaning of the copula, we can always change a categorical syllogism of the one quantity into a categorical syllogism of the other.[2]

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[1] See above, p. 193. — Ed.

[2] Not in Inductive Syllogisms. *Jotting.* [See below, p. 228. — Ed.]

In this paragraph is enounced the general nature of a categorical syllogism, as competent in both the quantities of extension and comprehension, or, with more propriety, of comprehension and extension; for comprehension, as prior to extension in the order of nature and knowledge ought to stand first. But as all logicians, with the doubtful exception of Aristotle, have limited their consideration to that process of reasoning given in the quantity of extension, to the exclusion of that given in the quantity of comprehension, it will be proper, in order to avoid misapprehension, to place some of the distinctions expressed in this paragraph in a still more explicit contrast.

The reasoning in Comprehension and that in Extension explicitly compared and contrasted.

In the reasonings under both quantities, the words expressive of the relations and of the things related are identical. The things compared in both quantities are the same in nature and in number. In each there are three notions, three terms, and three propositions, combined in the same complexity; and, in each quantity, the same subordination of a greatest, a greater, and a least. The same relatives and the same relations are found in both quantities. But though the relations and the relatives be the same, the relatives have changed relations. For while the relation between whole and part is the one uniform relation in both quantities, and while this relation is thrice realized in each between the same terms; yet, the term which in the one quantity was the least, is in the other the greatest, and the term which in both is intermediate, is in the one quantity contained by the term which in the other it contained.

Narrow and erroneous definitions by logicians of the Major, Middle, and Minor terms.

Now, you are to observe that logicians, looking only to the reasoning competent under the quantity of extension, and, therefore, looking only to the possibility of a single relation between the notions or terms of a syllogism, have, in consequence of this one-sided consideration of the subject, given definitions of these relatives, which are true only when limited to the kind of reasoning which they exclusively contemplated. This is seen in their definitions of the Major, Middle, and Minor Terms.

1. Major.

In regard to the first, they all simply define the Major term to be the predicate of the conclusion. This is true of the reasoning under extension, but of that exclusively. For the Major term, that is, the term which contains both the others — in the reasoning of comprehension, is the subject of the conclusion. Again, the Minor term they all simply define to be the subject of the conclusion; and this is likewise true only of the reasoning under extension: for, in the reasoning under comprehension, the Minor term is the predicate of the conclusion.

2. Minor.

Finally, they all simply define the Middle term as that which is contained under the predicate, and contains under it the subject of the conclusion. But this definition, like those of the two other terms, must be reversed as applied to the reasoning under comprehension. I have been thus tediously explicit, in order that you should be fully aware of the contrast of the doctrine I propose, to what you will find in logical books; and that you may be prepared for the further development of this doctrine, — for its application in detail.

3. Middle.

Nomenclature of Major, Minor, and Middle terms.

In regard to the nomenclature of the Major, Minor, and Middle terms, it is not necessary to say much. The expression *term* (*terminus*, ὅρος), was first employed by Aristotle, and, like the greater part of his logical vocabulary, was, as I have observed, borrowed from the language of Mathematics.[1] You are aware that the word *term* is applied to the ultimate constituents both of propositions and of syllogisms. The terms of a proposition are the subject and predicate. The terms of a syllogism are the three notions which in their threefold combination form the three propositions of a syllogism.

Aristotle's definition of the terms of a syllogism.

The major and minor terms Aristotle, by another mathematical metaphor, calls the *extremes* (ἄκρα), the *major* and *minor extremes;* and his definition of these and of the middle term is, unlike those of the subsequent logicians, so general, that it will apply with perfect propriety to a syllogism in either quantity. "I call," he says, "the middle term that which is both itself in another and another in it; and which, by its position, lies in the middle; the extremes I call both that which is in another and that in which another is."[2] And in another place he says, "I define the major extreme that in which the middle is; the minor extreme that which is subordinated to the middle."[3]

His definition of the Middle term, as middle by position, not applicable to the mode in which subsequent logicians enounce the syllogism.

I may notice that the part of his definition of the middle term, where he describes it as "that which, by its position, lies in the middle," does not apply to the mode in which subsequent logicians enounce the syllogism. For let A be the major, B the middle, and C the minor term of an Extensive Syllogism, this will be expressed thus:

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[1] See Scheibler, [*Opera Logica*, Pars. iii. c. 2, p. [illegible], and above, p. 193, note 4. — Ed.]

[2] *Anal. Prior.* L. i., c. 4, § 4.

[3] *Ibid.*, § 8.

Sumption, . . . . . . B *is* A, *i. e.* B *is contained under* A.
Subsumption, . . . . C *is* B, *i. e.* C *is contained under* B.
Conclusion, . . . . . C *is* A, *i. e.* C *is also contained under* A.

But quite applicable to the reasoning in Comprehension.

In this syllogism the middle term B stands first and last in the premises, and, therefore, Aristotle's definition of the middle term, not only as middle by nature, containing the minor and contained by the major, but as middle by position, standing after the major and before the minor, becomes inept. It will apply, however, completely to the reasoning in comprehension; for the extensive syllogism given above being converted into an intensive, by reversing the two premises, it will stand as follows:

Sumption, . . . . . . C *is* B, *i. e.* C *contains in it* B.
Subsumption, . . . . B *is* A, *i. e.* B *contains in it* A.
Conclusion, . . . . . C *is* A, *i. e.* C *also contains in it* A.

It does not, however, follow, that Aristotle contemplated exclusively the reasoning in Comprehension.

It does not follow, however, from this, that Aristotle either contemplated exclusively the reasoning in comprehension, or that he contemplated the reasonings in both quantities: for it is very easy to state a reasoning in extension, so that the major term shall stand first, the middle term second, and the minor last. We can state it thus:

Sumption, . . . . . . A *is* B, *i. e.* A *contains under it* B.
Subsumption, . . . . B *is* C, *i. e.* B *contains under it* C.
Conclusion, . . . . . A *is* C, *i. e.* A *contains under it* C.

This is as good a syllogism in extension as the first, though it is not stated in the mode usual to logicians. We may also convert it into a comprehensive syllogism, by reversing its premises and the meaning of the copula, though here also the mode of expression will be unusual:

Sumption, . . . . . . B *is* C, *i. e.* B *is contained in* C.
Subsumption, . . . . A *is* B, *i. e.* A *is contained in* B.
Conclusion, . . . . . A *is* C, *i. e.* A *is contained in* C.

From this you will see, that it is not to the mere external arrangement of the terms, but to the nature of their relation, that we must look in determining the character of the syllogism.

Before leaving the consideration of the terms of a syllogism, I may notice that the most convenient mode of stating a syllogism in an abstract form, is by the letters S, P, and M, — S signifying the subject, as P the predicate, of the conclusion, and M the middle term of the syllogism. This you will be pleased to recollect, as we shall find it necessary to employ this notation in showing the differences of syllogisms from the different arrangement of their terms.

Most convenient mode of stating a syllogism in an abstract form.

I have formerly stated that categorical syllogisms are regulated by the fundamental laws of Identity and Contradiction; the law of Identity regulating Affirmative, the law of Contradiction, Negative, Categoricals. As, however, the laws of Identity and Contradiction are capable of certain special applications, these will afford the ground of a division of Categorical Syllogisms into a corresponding number of classes. It has been already stated, that all reasoning is under the relation of whole and part, and, consequently, the laws of Identity and Contradiction will find their application to categorical syllogisms only under this relation.

Categorical Syllogisms divided into special classes according to the applications of the laws of Identity and Contradiction under the relation of whole and part.

But the relation of whole and part may be regarded in two points of view; for we may either look from the whole to the parts, or look from the parts to the whole. This being the case, may we not apply the principles of Identity and Contradiction in such a way that we either reason from the whole to the parts, or from the parts towards the whole? Let us consider: looking at the whole and the parts together on the principle of Identity, we are assured that the whole and all its parts are one, — that whatever is true of the one is true of the other, — that they are only different expressions for the different aspects in which we may contemplate what in itself is absolutely identical. On the principle, therefore, that the whole is only the sum of the parts, I am entitled, on the one hand, looking from the whole to its parts, to say with absolute certainty, — What belongs to a whole belongs to its part; and what does not belong to a whole does not belong to its part: and on the other, looking from the parts to their whole, to say, — What makes up all the parts constitutes the whole; and what does not make up all the parts does not constitute the whole. Now, these two applications of the principles of Identity and Contradiction, as we look from one term of the relation of whole and part, or from the other, determine two different kinds of reasoning. For if we reason downwards, from

The relation of whole and part may be regarded in two points of view, and thus affords two classes of Reasonings.

a containing whole to a contained part, we shall have one sort of reasoning which is called the *Deductive;* whereas, if we reason upwards, from the constituent parts to a constituted whole, we shall have another sort of reasoning, which is called the *Inductive.* This I shall briefly express in the following paragraph.

Par. LVIII. Categorical Syllogisms divided into Deductive and Inductive.

¶ LVIII. — Categorical Syllogisms are *Deductive*, if, on the principles of Identity and Contradiction, we reason downwards, from a containing whole to a contained part; they are *Inductive*, if, on these principles, we reason upwards, from the constituent parts to a constituted whole.

I. Deductive Categorical Syllogisms.

This is sufficient at present to afford you a general conception of the difference of Deductive and Inductive Categoricals. The difference of these two kinds of reasoning will be properly explained, when, after having expounded the nature of the former, we proceed to consider the nature of the latter. We shall now, therefore, consider the character of the deductive process, — the process which has been certainly and most successfully analyzed by logicians; for, though their treatment of deductive reasoning has been one-sided and imperfect, it is not positively erroneous; whereas, their analysis of the inductive process is at once meagre and incorrect. And, first, of the proximate canons by which Deductive Categoricals are regulated.

Par. LIX. Deductive Categoricals, — their canons.

¶ LIX. In Deductive Categoricals the universal laws of Identity and Contradiction take two modified forms, according as these syllogisms proceed in the quantity of Comprehension or in that of Extension. The peculiar canon by which Intensive Syllogisms of this class are regulated, is, — What belongs to the predicate belongs also to the subject; what is repugnant to the predicate is repugnant also to the subject. The peculiar canon by which Extensive Syllogisms of this class are regulated is, — What belongs to the genus belongs to the species and individual; what is repugnant to the genus is repugnant to the species and individual. Or, more briefly, What pertains to the higher class pertains also to the lower.

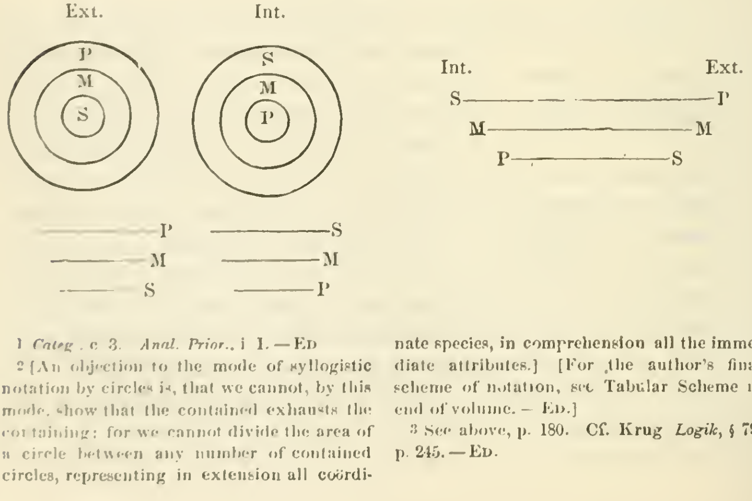
Both these laws are enounced by Aristotle,[1] and both, from him, have passed into the writings of subsequent logicians. The former, as usually expressed, is, — *Prædicatum prædicati est etiam prædicatum subjecti;* or, *Nota notæ est etiam nota rei ipsius.* The latter is correspondent to what is called the *Dicta de Omni et de Nullo;* the *Dictum de Omni*, when least ambiguously expressed, being, — *Quicquid de omni valet, valet etiam de quibusdem et singulus;* — and the *Dictum de Nullo* being, — *Quicquid de nullo valet, nec de quibusdam nec de singulis valet.* But as logicians have altogether overlooked the reasoning in Comprehension, they have, consequently, not perceived the proper application of the former canon; which, therefore, remained in their systems either a mere *hors d'œuvre*, or else was only forced into an unnatural connection with the principle of the syllogism of extension.

Explication.

Before stating to you how the preceding canons are again, in their proximate application to categorical syllogisms, for convenience sake, still more explicitly enounced in certain special rules, it will be proper to show you the method of marking the connection of the propositions and terms of a categorical syllogism by sensible symbols. Of these there are various kinds, but, as I formerly noticed, the best upon the whole, because the simplest, is that by circles.[2] According to this method, syllogisms with affirmative and negative conclusions would be thus represented.[3]

Connection of the propositions and terms of the Categorical Syllogism illustrated by sensible symbols.

AFFIRMATIVE.



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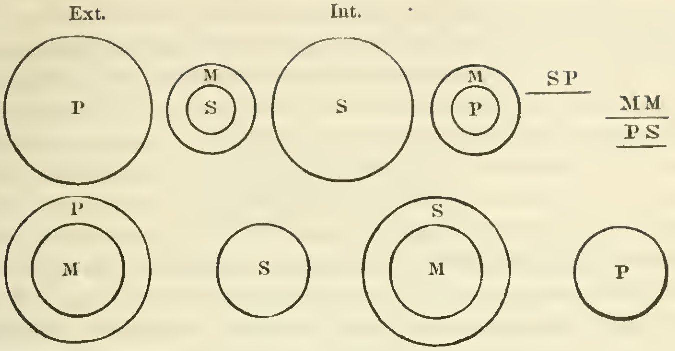
[1] *Categ.*, c. 3. *Anal. Prior.*, i. 1. — Ed.

[2] [An objection to the mode of syllogistic notation by circles is, that we cannot, by this mode, show that the contained exhausts the containing: for we cannot divide the area of a circle between any number of contained circles, representing in extension all coördinate species, in comprehension all the immediate attributes.] [For the author's final scheme of notation, see Tabular Scheme at end of volume. — Ed.]

[3] See above, p. 180. Cf. Krug *Logik*, § 79 p. 245. — Ed.

NEGATIVE.



Proximate Rules of Categorical Syllogisms. 1. Extensive.

You are now prepared for the statement and illustration of the various proximate rules by which all categorical syllogisms are regulated. And, first, in regard to these rules in relation to the reasoning of Extension.

"Aldrich," says Dr. Whately, "has given twelve rules, which I find might be more conveniently reduced to six. No syllogism can be faulty which violates none of these rules."[1] This reduction of the syllogistic rules to six is not original to Dr. Whately; but had he looked a little closer into the matter, he might have seen that the six which he and other logicians enumerate, may, without any sacrifice of precision, and with even an increase of perspicuity, be reduced to three. I shall state these in a paragraph, and then illustrate them in detail.

**Par. LX. The Three Rules of the Extensive Categorical Syllogism.**

¶ LX. An Extensive Categorical Syllogism, if regularly and fully expressed, is governed by the three following rules:

I. It must have three, and only three, Terms, constituting three, and only three, Propositions.

II. Of the premises, the Sumption must in quantity be Definite (*i. e.* universal or singular), and the Subsumption in quality Affirmative.

III. The Conclusion must correspond in Quantity with the Subsumption, and in Quality with the Sumption.[2]

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[1] *Elements of Logik*, B. ii. c. iii. § 2, p. 85, 8th edit. — ED.

[2] Krug, *Logik*, § 80. — ED. [Cf. Alexander Aphrodisiensis, *In An. Prior.*, L. I., f. 17, Ald. Derodon, *Logica Restituta*, p. 639 *et seq.* Hoffbauer, *Anfangsgründe der Logik*, § 317, p. 164. Bachmann, *Logik*, § 122, p. 187. Esser, *Logik*, §§ 88, 89 Schulze, *Logik*, § 79. Fries, *Logik*, § 55, p. 224.]

Illustration. First Rule

What is properly to be regarded as a logical term

These three simple laws comprise all the rules which logicians lay down with so confusing a minuteness.[1] The first is: — A categorical syllogism, if regular and perfect, must have three, and only three, propositions, made up of three, and only three, terms. "The necessity of this rule is manifest from the very notion of a categorical syllogism. In a categorical syllogism the relation of two notions to each other is determined through their relation to a third; and, consequently, each must be compared once with the intermediate notion, and once with each other. It is thus manifest that there must be three, and cannot possibly be more than three, terms; and that these three terms must in their threefold comparison, constitute three, and only three, propositions. It is, however, to be observed, that it may often happen as if, in a valid syllogism, there were more than three principal notions, — three terms. But, in that case, the terms or notions are only complex, and expressed by a plurality of words. Hence it is, that each several notion extant in a syllogism, and denoted by a separate word, is not on that account to be viewed as a logical term or terminus, but only those which, either singly or in connection with others, constitute a principal momentum of the syllogism."[2] Thus, in the following syllogism, there are many more than three several notions expressed by three several words, but these, we shall find, constitute in reality only three principal notions or logical terms:

Sumption . . . . . . *He who conscientiously performs his duty is a truly good man;*
Subsumption . . . *Socrates conscientiously performs his duty;*
Conclusion . . . . . *Therefore, Socrates is a truly good man.*

Here there are in all seven several notions denoted by seven separate words: — 1. *Conscientiously*, 2. *Performs*, 3. *Duty*, 4. *Truly*, 5. *Good*, 6. *Man*, 7. *Socrates;* but only three principal notions or logical terms, — viz., 1. *Conscientiously performs his duty*, 2. *Truly good man*, 3. *Socrates*.

*Quaternio Terminorum.*

"When, on the other hand, the expression of the middle term in the sumption and subsumption is used in two significations, there may, in that case, appear to be only three terms, while there are in reality four; or as it is technically styled in logic, a *quaternio terminorum*.[3] On this account, the syllogism is vicious in point of form, and, consequently, can afford no inference, howbeit that the several propositions may, in point of matter, be all true. And why? — because there is here no mediation, consequently no connection between the different terms of the syllogism. For example:

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[1] See Scheibler, *Opera Logica*, pars. iv., p. 516. Keckermann, *Systema Logicæ Minus*, *Opera*, t. i., p. 239. — Ed.

[2] Krug, *Logik*, § 80, p. 246. Anm. 1. — Ed

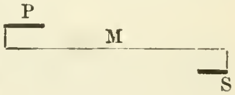
[3] [Cf. Fonseca, [*Instit Dial.*, L. vi. c. 20, p 359. — Ed.]

*The animals are void of reason;*
*Man is an animal;*
*Therefore, man is void of reason.*

"Here the conclusion is invalid, though each proposition, by itself, and in a certain sense, may be true. For here the middle term, *animal*, is not taken in the same meaning in the major and minor propositions. For in the former, it is taken in a narrower signification, as convertible with *brute*, in the latter in a wider signification, as convertible with *animated organism*."[1]

Second Rule.

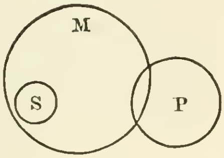
The second rule is: — Of the premises, the sumption must in quantity be definite (universal or singular), the subsumption must in quality be affirmative. — The sumption must in reference to its quantity be definite; because it affords the general rule of the syllogism. For if it were indefinite, that is, particular, we should have no security that the middle term in the subsumption comprised the same part of the sphere which it comprised in the sumption.



Thus:

*Some* M *are* P;
*All* S *are* P;

*All* S *are* P.



Or, in a concrete example:

*Some works of art are cubical;*
*All pictures are works of art;*
*Therefore, all pictures are cubical;*

In regard to the subsumption, this is necessarily affirmative. The sumption is not limited to either quality, because the proposition enouncing a general rule may indifferently declare *All* M *is* P, and *No* M *is* P. The assumption is thus indeterminate in regard to quality. But not so the proposition enouncing the application of a general rule. For it must subsume, that is, it must affirm, that something is contained under a condition; and is, therefore, necessarily affirmative. We must say S *is* M. But in respect of quantity it is undetermined, for we can either say *All* S *is* M, or *Some* S *is* M. If the subsumption is negative, there is no inference; for it is not necessary that a genus should contain only things of a certain species. This is shown in the following example:

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[1] Krug, *Logik*, p. 247. — Ed.

*All men are animals;*
*No horse is a man;*
*Therefore, no horse is an animal.*

Or, as abstractly expressed:

*All* M *are* P;
*But no* S *is* M;
*No* S *is* P.

Thus it is, that in a regular extensive categorical syllogism, the sumption must be always definite in quantity, the subsumption always affirmative in quality.[1]

Misconception in regard to definiteness of sumption in second rule obviated.

I have, however, to add an observation requisite to prevent the possibility of a misconception. In stating it as a rule of extensive categoricals, that the sumption must be definite (universal or singular), if you are at all conversant with logical books, you will have noticed that this rule is not in unison with the doctrine therein taught, and you may, accordingly, be surprised that I should enounce as a general rule what is apparently contradicted by the fact that there are syllogisms — valid syllogisms — of various forms, in which the sumption is a particular, or the subsumption a negative, proposition. In explanation of this, it is enough at present to say, that in these syllogisms the premises are transposed in the expression. You will, hereafter, find that the sumption is not always the proposition which stands first in the enunciation, as the conclusion is not always the proposition which stands last. Such transpositions are, however, only external accidents, and the mere order in which the premises and conclusion of a syllogism are enounced, no more changes their nature and their necessary relation to each other, than does the mere order in which the grammatical parts of a sentence are expressed, alter their essential character and reciprocal dependence. In the phrases *vir bonus* and *bonus vir*, — in both, the *vir* is a substantive and the *bonus* an adjective. In the

The mere order of enunciation does not constitute the sumption or subsumption in a reasoning.

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[1] Krug, *Logik*, p. 248. Bachmann, *Logik*, § 124. — ED.

What truly constitutes the sumption and subsumption in a reasoning.

sentence variously enounced, — *Alexander Darium vicit, — Alexander vicit Darium, — Darium Alexander vicit, — Darium vicit Alexander, — Vicit Alexander Darium, — Vicit Darium Alexander :* — in these, a difference of order may denote a difference of the interest we feel in the various constituent notions, but no difference of their grammatical or logical relations. It is the same with syllogisms. The mere order of enunciation does not change a sumption into a subsumption, nor a subsumption into a sumption. It is their essential relation and correlation in thought which constitutes the one proposition a major, and the other a minor premise. If the former precede the latter in the expression of the reasoning, the syllogism is technically regular; if the latter precede the former, it is technically irregular or transposed. This, however, as you will hereafter more fully see, has not been attended to by logicians, and in consequence of their looking away from the internal and necessary consecution of the premises to their merely external and accidental arrangement, the science had been deformed and perplexed by the recognition of a multitude of different forms, as real and distinct, which exist only, and are only distinguished, by certain fortuitous accidents of expression. This being understood, you will not marvel at the rule in regard to the quantity of sumptions in extensive syllogisms (which, however, I limited to those that were regularly and fully expressed), — that it must be definite. Nor will you marvel at the counter canon in regard to the quality of sumptions in intensive syllogisms, — that it must be affirmative.[1]

Third Rule.

The necessity of the last rule is equally manifest as that of the preceding. It is: — The conclusion must correspond in quantity with the subsumption, and in quality with the sumption. "This rule is otherwise enounced by logicians: — The conclusion must always follow the weaker or worser part, — the negative and the particular being held to be weaker or worser in relation to the affirmative and universal. The conclusion, in extensive categoricals (with which we are at present occupied) is made up of the minor term, as subject, and of the major term, as predicate. Now, as the relation of these two terms to each other is determined by their relation to the middle term, and as the middle term is compared with the major term in the sumption; it follows that the major term must hold the same relation to the minor in the conclusion which it held to the middle in the sumption. If then the sumption is affirmative, so likewise must be the conclusion; on the other hand, if the sumption be negative, so likewise must be the conclusion. In the subsumption, the minor term is compared with the middle; that is, the minor is affirmed as under the middle. In the conclusion, the major term cannot, therefore, be predicated of more things than were affirmed as under the middle term in the subsumption. Is the subsumption, therefore, universal, so likewise must be the conclusion; on the contrary, is the former particular, so likewise must be the latter."[1]

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[1] [See Bachmann, *Logik*, § 124, pp. 192, 194 Anm 3 Drobisch, *Logik*, § 73, h. 65, §§ 42, 44, pp. 34, 36. Schulze, *Logik*, § 79, p. 114. Krug, *Logik*, § 82, p. 249. Cf. § 83, p. 264, and § 109, p. 362. Facciolati, *Rudimenta Logica*, P. iii. c. iii. p 91.]

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[1] Krug, *Logik*, § 80, p. 250-1. — ED.

# LECTURE XVII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—THE DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO INTERNAL FORM.

### A. SIMPLE.—CATEGORICAL.—II. DEDUCTIVE IN COMPREHENSION—III. INDUCTIVE IN EXTENSION AND COMPREHENSION.—B. CONDITIONAL—DISJUNCTIVE

Recapitulation.

In my last Lecture, after terminating the consideration of the constituent elements of the Categorical Syllogism in general, whether in the quantity of Comprehension or of Extension, I stated the subdivision of Categorical Syllogism into Deductive and Inductive—a division determined by the difference of reasoning from the whole to the parts. or from the parts to the whole. Of these, taking the former—the Deductive—first into consideration, I was occupied, during the remainder of the Lecture, in giving a view of the laws which, in their higher or lower universality—in their remoter or more proximate application, govern the legitimacy and regularity of Deductive Categorical Syllogisms. Of these laws, the highest are the axioms of Identity and Contradiction, by which all Categorical Syllogisms are controlled. These, when proximately applied to the two forms of Deductive Categoricals, determined by the two quantities of Comprehension and Extension, constitute two canons,—the canon of the Intensive Syllogism being: What belongs to the predicate belongs also to the subject—what is repugnant to the predicate is repugnant also to the subject;—the canon of the Extensive Syllogism being: What belongs to the genus belongs also to the species and individual—what is repugnant to the genus is repugnant also to the species and individual. Each of these, however, in its more proximate application, is still further developed into a plurality of more explicit rules. In reference to Extensive Syllogism, the general law, or the *Dictum de Omni et de Nullo* (as it is technically called) is evolved into a series of rules, which have been multiplied to twelve, are usually recalled to six, but which, throwing out of account irregular and imperfect syllogism, may be conveniently reduced to three. These are, I. An Extensive Categorical Deductive Syllogism must have three, and only three, terms—constituting three, and only three, propositions. II. The sumption must in quantity be definite (*i. e.*, universal or singular); the subsumption must in quality be affirmative. III. The conclusion must correspond in quantity with the subsumption, and in quality with the sumption. The Lecture concluded with an explanation of these rules in detail.

2. The Intensive Categorical Deductive Syllogism

We have now, therefore, next to consider into what rules the law of Intensive or Comprehensive Syllogism is developed, in its more proximate application. Now, as the intensive and extensive syllogisms are always the counterparts of each other, the proximate rules of the two forms must, consequently, be either precisely the same, or precisely the converse of each other. Accordingly, taking the three rules of extensive syllogisms, we find that the first law is also, without difference, a rule of intensive syllogisms. But the second and third, to maintain their essential identity, must be externally converted; for to change an extensive syllogism into an intensive, we must transpose the order or subordination of the two premises, and reverse the reciprocal relation of the terms. The three general rules of an Intensive Categorical Deductive Syllogism will, therefore, stand as follows:

Par. LXI. Rules of the Intensive Categorical Deductive Syllogism.

¶ LXI. An Intensive Categorical Deductive Syllogism, that is, one of Depth, if regularly and fully expressed, is governed by the three following rules:

I. It must have three, and only three, terms,—constituting three, and only three, propositions.

II. Of the premises, the Sumption must in quality be Affirmative, and the Subsumption in quantity Definite (that is, universal or singular).

III. The Conclusion must not exceed the Sumption in Quantity, and in Quality must agree with the Subsumption.

Explication. First Rule.

In regard to the first of these rules, — the rule which is identical for syllogisms whether extensive or intensive, it is needless to say anything; for all that I stated in regard to it under the first of these forms, is valid in regard to it under the second.

Second Rule.

I proceed to the second, which is, — The sumption must in quality be affirmative, the subsumption must in quantity be definite (that is, universal or singular). And, here, we have to answer the question, — Why in an intensive syllogism must the sumption be affirmative in quality, the subsumption definite in quantity? Let us take the following syllogism as explicated:

S *comprehends* M;
M *does not comprehend* P;
*Therefore*, S *does not comprehend* P.

*Prudence comprehends virtue;*
*But virtue does not comprehend blameworthy;*
*Therefore, prudence does not comprehend blameworthy.*

Here all goes on regularly. We descend from the major term *prudence* to the middle term *virtue*, and from the middle term *virtue* to the minor term *blameworthy*. But let us reverse the premises. We at once see that though there is still a discoverable meaning, it is not directly given, and that we must rectify and restore in thought what is perverse and preposterous in expression. In the previous example, the sumption is affirmative, the subsumption negative. Now let us take a negative sumption:

S *does not comprehend* M;
*But* M *comprehends* P.

Here there is no conclusion competent, for we can neither say S *comprehends* P, nor S *does not comprehend* P. Or to take a concrete example:

*Prudence does not comprehend learning;*
*But learning comprehends praiseworthy.*

We can draw, it is evident, no conclusion; for we can neither say, from the relation of the two propositions, that *Prudence comprehends praiseworthy*, nor that *Prudence does not comprehend praiseworthy.*

Grounds of the rules regarding Sumption and Subsumption in Extensive and Comprehensive Syllogisms.

The reason why an extensive syllogism requires a universal sumption, and an intensive syllogism an affirmative, and why the one requires an affirmative and the other a definite subsumption, is the following: The condition common to both syllogisms is that the sumption should express a rule. But in the extensive syllogism this law is an universal rule, that is, a rule to which there is no exception; but then it may be expressed either in an affirmative or in a negative form, whereas in the intensive syllogism this law is expressed as a position, as a fact, and, therefore, admits only of an affirmative form, but, as it is not necessarily universal, it admits of limitations or exceptions. This opposite character of the sumptions of the two forms of syllogisms is correspondent to the opposite character of their subsumptions. In the extensive syllogism, the subsumption is, and can only be, an affirmative declaration of the application of the sumption as a universal rule. In the intensive syllogism, the subsumption is either an affirmation or a negation of the application of the sumption as a positive law. Hence it is that in an intensive syllogism the major premise is necessarily an affirmative, while the minor may be either an affirmative or a negative proposition.

In regard to the second clause of the second rule, the reason why the subsumption in an intensive syllogism must be definite in quantity, is because it would otherwise be impossible to affirm or deny of each other the minor and the major terms in the conclusion. For example:

Sumption...... *Prudence is a virtue;* i. e., *Prudence comprehends virtue.*
Subsumption... *Some virtue is praiseworthy;* i. e., *Some virtue comprehends praiseworthy.*

From these we can draw no conclusion, for the indefinite *some virtue* does not connect the major term *prudence* and the minor term *praiseworthy* into the necessary relation of whole and part.

Third Rule.

In regard to the third rule, — The conclusion must be correspondent in quantity with the sumption, and in quality with the subsumption, — it is not necessary to say anything. Here, as in the extensive syllogism, the conclusion cannot be stronger than the weakest of its antecedents, that is, if any premise be negative, the conclusion cannot but be negative also: and if any premise be particular, the conclusion cannot be but particular likewise; and as a weaker quality is only found in the subsumption, and a weaker quantity in the sumption, it follows that (as the rule declares) the conclusion is regulated by the sumption in regard to its quantity, and by the subsumption in regard to its quality. It is, however, evident, that though warranted to draw a universal conclusion from a general sumption, it is always competent to draw only a particular.

II. Inductive Categorical Syllogisms.

So much for the proximate laws by which Categorical Deductive Syllogisms are governed, when considered as perfect and regular in external form. We shall, in the sequel, have to consider the special rules by which the varieties of Deductive Categorical Syllogisms, as determined by their external form, are governed; but at present we must proceed to the general consideration of the other class of categorical syllogisms afforded by their internal form, — I mean those of Induction, the discussion of which I shall commence by the following paragraph:

Par. LXII. Inductive Categorical Syllogism, — what.

¶ LXII. An Inductive Categorical Syllogism is a reasoning in which we argue from the notion of all the constituent parts discretively, to the notion of the constituted whole collectively. Its general laws are identical with those of the Deductive Categorical Syllogism, and it may be expressed, in like manner, either in the form of an Intensive or of an Extensive Syllogism.

The views of logicians regarding the nature of Logical Induction erroneous.

We shall, in the sequel, have to consider more particularly the nature and peculiarities of Logical Induction, when we come to treat of the Figure of Syllogism, and when we consider the nature of Logical or Formal, in contrast to Philosophical or Real Induction, under the head of Modified Logic. At present, I shall only say, that all you will find in logical works of the character of logical induction is utterly erroneous; for almost all logicians, except Aristotle, consider induction, not as regulated by the necessary laws of thought, but as determined by the probabilities and presumptions of the sciences from which its matter has accidentally been borrowed. They have not considered it, logically, in its formal, but only, extralogically, in its material conditions. Thus, logicians have treated in Logic of the inductive inference from the parts to the whole, not as exclusively warranted by the law of Identity, in the convertibility of the whole and all its parts, but they have attempted to establish an illation from a few of these parts to the whole; and this, either as supported by the general analogies of nature, or by the special presumptions afforded by the several sciences of objective existence.[1]

The characters of Logical or Formal, and of Real or Material, Induction.

Logicians, with the exception of Aristotle, who is, however, very brief and unexplicit in his treatment of this subject, have thus deformed their science, and perplexed the very simple doctrine of logical induction, by confounding formal with material induction. All inductive reasoning is a reasoning from the parts to the whole; but the reasoning from the parts to the whole in the various material or objective sciences, is very different from the reasoning from the parts to the whole in the one formal or subjective science of Logic. In the former, the illation is not simply founded on the law of Identity, in the convertibility of a whole and all its parts, but on certain presumptions drawn from an experience or observation of the constancy of nature; so that, in these sciences, the inference to the whole is rarely from all, but generally from a small number of, its constituent parts; consequently, in them, the conclusion is rarely in truth an induction properly so called, but a mixed conclusion, drawn on an inductive presumption combined with a deductive premise. For example, the physical philosopher thus reasons:

*This, that, and the other magnet attract iron;*
*But this, that, and the other magnet represent all magnets;*
*Therefore, all magnets attract iron.*

Now, in this syllogism, the legitimacy of the minor premise, *This, that, and the other magnet represent all magnets*, is founded on the principle, that nature is uniform and constant, and, on this general principle, the reasoner is physically warranted in making a few parts equivalent to the whole. But this process is wholly incompetent to the logician. The logician knows nothing of any principles except the laws of thought. He cannot transcend the sphere of necessary, and pass into the sphere of probable, thinking; nor can he bring back, and incorporate into his own formal science, the conditions which regulate the procedure of the material sciences. This being the case, induction is either not a logical process different from deduction, for the induction of the objective philosopher, in so far as it is formal, is in fact deductive; or there must be an induction governed by other laws than those which warrant the induction of the objective philosopher. Now, if logicians had looked to their own sciences, and not to sciences with which, as logicians, they had no concern, they would have seen that there is a process of reasoning from the parts to the whole, as well as from the whole to the parts, that this process it governed by its own laws, and is equally necessary and independent as the other. The rule by which the Deductive Syllogism is governed is: What belongs, or does not belong, to the containing whole, belongs, or does not belong, to each and all of the contained parts. The rule by which the Inductive Syllogism is governed is: What belongs, or does not belong, to all the constituent parts, belongs, or does not belong, to the constituted whole. These rules exclusively determine all formal inference; whatever transcends or violates them, transcends or violates Logic. Both are equally absolute. It would be not less illegal to infer by the deductive syllogism, an attribute belonging to the whole of something it was not conceived to contain as a part; than by the inductive, to conclude of the whole what is not conceived as a predicate of all its constituent parts. In either case, the consequent is not thought as determined by the antecedent; the premises do not involve the conclusion.[1]

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[1] Compare *Discussions*, p. 159. — ED.

Canons of the Deductive and Inductive Syllogisms — equally formal.

These reasonings illustrated.

To take the example previously adduced as an illustration of a material or philosophical induction, it would be thus expressed as a formal or logical:

*This, that, and the other magnet attract iron;*
*But this, that, and the other magnet are all magnets;*
*Therefore, all magnets attract iron.*

Here the inference is determined exclusively by a law of thought. In the subsumption, it is said, *This*, *that*, *and the other magnet etc.*, *are all magnets.* This means, *This*, *that*, *and the other magnet are*, that is, *constitute*, or rather, *are conceived to constitute all magnets*, that is, *the whole*, — *the class*, — *the genus magnet.* If, therefore, explicitly enounced, it will be as follows: *This*, *that*, *and the other magnet are conceived to constitute the whole class magnet.* The conclusion is — *Therefore*, *all magnets attract iron.* This, if explicated, will give — *Therefore*, *the whole class magnet is conceived to attract iron.* The whole syllogism, therefore, as a logical induction, will be:

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[1] [Cf. Krug, *Logik*, §§ 166, 167. Sanderson, *Compendium Log. Artis*, L. iii. c. x. p. 112. Wolf. *Phil. Rationalis*, §§ 477, 478. Scotus. [*Quæstiones in An. Prior.*, L. ii. q. viii. p 316. ed. 1610. — Ed.]

*This, that, and the other magnet attract iron;*
*But this, that, and the other magnet, etc., are conceived to constitute the genus magnet;*
*Therefore, the genus magnet attracts iron.*

Objection obviated.

It is almost needless to advert to an objection which, I see, among others, has misled Whately. It may be said that the minor, *This, that, and the other magnet are all magnets*, is manifestly false. This is a very superficial objection. It is very true that neither here, nor indeed in almost any of our inductions, is the statement objectively correct, — that the enumerated particulars are really equivalent to the whole or class which they constitute, or in which they are contained. But, as an objection to a logical syllogism, it is wholly incompetent, as wholly extralogical. For the logician has a right to suppose any material impossibility, any material falsity; he takes no account of what is objectively impossible or false, and has a right to assume what premises he please, provided that they do not involve a contradiction in terms. In the example in question, the subsumption, *This, that, and the other magnet are all magnets*, has been already explained to mean, not that they really are so, but merely that they are so thought to be. It is only on the supposition of *this*, *that*, and *the other magnet*, etc, being conceived to constitute the class *magnet*, that the inference proceeds, and, on this supposition, it will not be denied that the inference is necessary.

Formulæ for Inductive Syllogisms in Comprehension and Extension.

I stated that an inductive syllogism is equally competent in comprehension and in extension. For example, let us suppose that x, y, z, represent parts, and the letters A and B wholes, and we have the following formula of an inductive syllogism in Comprehension:

x, y, z, *constitute* A;
A *comprehends* B;
*Therefore*, x, y, z, *comprehend* B.

This, if converted into an extensive syllogism, by transposing the premises and reversing the copula, gives:

A *is contained under* B;
x, y, z, *constitute* A;
*Therefore*, x, y, z, *are contained under* B.

But in this syllogism it is evident that the premises are in an unnatural order. We must not, therefore, here transpose the premises, as we do in converting a deductive categorical of comprehension into one of extension. We may obtain an inductive syllogism in two different forms, and in either comprehension or extension, according as the parts stand for the major, or for the middle term. If the minor term is formed of the parts, it is evident there is no induction; for, in this case, they only constitute that quantity of the syllogism which is always a part, and never a whole. Let x, y, z represent the parts; where not superseded by x, y, z, S will represent the major term in a comprehensive, and the minor term in an extensive syllogism; P will represent the major term in an extensive, and the minor term in a comprehensive syllogism, and M the middle term in both. I shall first take the Inductive Syllogism of Comprehension.

| First Case, — (The parts holding the place of the major term S.) | Second Case, — (The parts holding the place of the middle term.) |
|---|---|
| x, y, z *constitute* M; | S *comprehends* x, y, z; |
| M *comprehends* P; | x, y, z *constitute* P; |
| *Therefore*, x, y, z *comprehend* P. | *Therefore*, S *comprehends* P. |

Again, in the Inductive Syllogism of Extension:

| First Case, — (The parts holding the place of the major term P.) | Second Case, — (The parts holding the place of the middle term.) |
|---|---|
| x, y, z *constitute* M; | x, y, z *are contained under* P; |
| S *is contained under* M; | x, y, z *constitute* S; |
| *Therefore* S *is contained under* x, y, z. | *Therefore*, S *is contained under* P. |

Whately and others erroneously make the Inductive Syllogism Deductive.

Doctrine of the older logicians.

Before leaving this subject, I may notice that the logical induction maintained by Whately and many others, diverges even more than that of the older logicians from the truth, inasmuch as it makes this syllogism a deductive syllogism, of which the sumption, which is usually understood and not expressed, is always substantially the same, namely, "What belongs (or does not belong) to the individuals we have examined, belongs (or does not belong) to the whole class under which they are contained." This doctrine was first, I think, introduced by Wolf,[1] for the previous logicians viewed the subsumption as the common, and, therefore, the suppressed premise, this premise always stating that the individuals, or particulars enumerated, made up the class under which they were severally contained.[1] For example, in the instance from the magnet we have already taken, the subsumption would be, *This, that, and the other magnet, and so forth, are the whole class magnet.* This doctrine of the older logicians is correct as far as it goes; and, to make it absolutely correct, it would only have been necessary to have established the distinction between the logical induction as governed by the *a priori* conditions of thought, and philosophical induction as legitimated by the *a posteriori* conditions of the matter, about which the inquiry is conversant. This, however, was not done, and the whole doctrine of logical induction was corrupted and confounded by logicians introducing into their science the consideration of various kinds of matter, and admitting as logical an induction supposed imperfect, that is, one in which there was inference to the whole from some only of the constituent parts. This Imperfect Induction, they held in contingent matter to be contingent, in necessary matter to be necessary, as if a logical inference were not, in all cases, necessary, and only necessary as governed by the necessary laws of thought. This misapprehension of the nature of logical or formal induction, and its difference from philosophical or material, has been the reason why Bacon is at fault in his criticism of Aristotle's doctrine of induction. For, looking only at the doctrine of the inductive syllogism given by Aristotle in the *Organon*, and not perceiving that the question there was only concerning the nature of induction as governed by the laws of thought, he forthwith assumed that this was the induction practised by the Stagirite in his study of nature, and, in the teeth both of the precept and practice of the philosopher, condemned the Aristotelic induction in the mass, as flying at once to general principles from the hasty enumeration of a few individual instances. Induction, as I mentioned, will, however, once and again, engage our attention in the sequel; but I have thought it proper to be somewhat explicit, that you might carry with you a clearer conception

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[1] [Cf. Wolf. *Philosophia Rationalis*, § 479, first ed. 1728 So, before Wolf, Schramm, *Aristot. Philos. Principia*, p. 27, ed. Helmst., 1718. "Inductione ex multis singularibus colligitur universale supposito loco majoris propositionis hoc canone: Quicquid competit omnibus partibus, hoc competit toti; in isto (Enthymemate) vel major vel minor præmissarum, in hoc (Inductione) semper major propositio subintelligitur." Refers as follows — "*De Inductione*, *Philos. Altorf.*, Disp. xxvi. p 252 *et seq.*" See also Crakanthorpe, *Logica*, c xx. p. 217, ed. 1677. [Cf. *Discussions*, p. 170, note. — Ed.]

Correct as far as it goes.

Doctrine of Imperfect Induction.

Bacon at fault in his criticism of Aristotle's doctrine of Induction.

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[1] [On Induction in general, see Zabarella, *Tabula in An. Prior.* p. 170 *et seq.*, *Opera Logica.* (Appendix.) Molinæus, *Elementa Logica*, L. i. c. ii. p. 99. Isendoorn, *Cursus Logicus*, L. iii. q. ii. p. 361. Crellius, *Isagoge*, L. iii. c. xx. p. 254. Keckermann, *Opera*, t. i. pp. 259, 763. Lambert, *Neues Organon*, i. §§ 286, 287, p. 183. Engenios Λογική, p. 410. Jo. Fr. Picus Mirandulanus.] [*Opera, Examen Doct. Vanit. Gent.* L. v. p. 746 *et seq.*—Ed.]

of the nature of this process, as contrasted with the process of the Deductive Syllogism.

B. Conditional Syllogisms.
1. Disjunctive.

Having terminated the general consideration of Categorical Syllogisms, Deductive and Inductive, I now proceed to the next class of Reasonings afforded by the internal form; I mean the class of Disjunctive Syllogisms.

Par. LXIII. A Disjunctive syllogism,—what.

¶ LXIII. A Disjunctive Syllogism is a reasoning, whose form is determined by the law of Excluded Middle, and whose sumption is accordingly a disjunctive proposition, either of Contradiction (as, A *is either* B *or not* B) — or of Contrariety (as, A *is either* B, *or* C, *or* D). In such a judgment, it is enounced that B *or not* B, or that B, C, *or* D, as opposite notions taken together and constituting a totality, are each of them a possible, and one or other of them a necessary, predicate of A. To determine which of these belongs, or does not belong to A, the subsumption must either affirm one of the predicates, and the conclusion, *eo ipso*, consequently, deny the other or others; or it must deny one or more of them, and thus necessitate in the conclusion, either the determinate affirmation of the other, or the indeterminate affirmation of the others. A Disjunctive Syllogism is thus either Affirmative, constituting the *Modus ponens*, or *Modus ponendo tollens*, or Negative, constituting the *Modus tollens*, or *Modus tollendo ponens*.

In each of these modes there are two cases, which I comprehend in the following mnemonic verses:

(A) Affirmative, or Modus ponendo tollens:—
1. *Falleris aut fallor; fallor; non falleris ergo.*
2. *Falleris aut fallor; tu falleris; ergo ego nedum.*

(B) Negative, or Modus tollendo ponens:—
1. *Falleris aut fallor; non fallor; falleris ergo.*[1]
2. *Falleris aut fallor; non falleris; ergo ego fallor.*

Explication.

In illustration of this paragraph, I have defined a disjunctive syllogism, one whose form is determined by the law of Excluded Middle, and whose sumption is, accordingly, a disjunctive proposition. I have not, as logicians in general do, defined it directly, — a syllogism whose major pre-

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[1] This line is from Purchot, *Instit. Philos. Logica*, t. 1, p. 184. The others are the Author's own. — Ed.

A syllogism with disjunctive major premise is not necessarily a disjunctive reasoning.

mise is a disjunctive proposition. For though it be true that every disjunctive syllogism has a disjunctive major premise, the converse is not true; for every syllogism that has a disjunctive sumption is not, on that account, necessarily a disjunctive syllogism. For a disjunctive syllogism only emerges, when the conclusion has reference to the relation of reciprocal affirmation and negation subsisting between the disjunct members in the major premise, — a condition not, however, contained in the mere existence of the disjunctive sumption.[1] For example, in the syllogism:

B *is either* C *or* D;
*But* A *is* B;
*Therefore,* A *is either* C *or* D.

This syllogism is as much a reasoning determined, not by the law of Excluded Middle, but solely by the law of Identity, as the following:

B *is* C.
A *is* B.
*Therefore,* A *is* C.

For in both we conclude, — C (in one, C *or* D) *is an attribute of* B; *but* B *is an attribute of* A: *therefore,* C (C *or* D) *is an attribute of* A, — a process, in either case, regulated exclusively by the law of Identity.[2]

This being premised, I now proceed to a closer examination of the nature of this reasoning, and shall, first, give you a general notion of its procedure; then, secondly, discuss its principle; and, thirdly, its constituent parts.

1°. General view of the Disjunctive Syllogism.

1°. The general form of the Disjunctive Syllogism may be given in the following scheme, in which you will observe there is a common sumption to the negative and affirmative modes:

(a.) Formula for a Syllogism with two disjunct members.

A *is either* B *or* C.

| AFFIRMATIVE, OR MODUS PONENDO TOLLENS — | NEGATIVE, OR MODUS TOLLENDO PONENS — |
|---|---|
| *Now* A *is* B; | *Now* A *is not* B; |
| *Therefore,* A *is not* C. | *Therefore,* A *is* C. |

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[1] Cf. Scheibler, *Opera Logica*, Pars. iv. p. 553. "Neque enim syllogismus disjunctus semper est, cum propositio est disjunctiva, sed cum tota quæstio disponitur in propositione." ED.

[2] Sigwart, pp. 154, 157. [*Handbuch zur Vorlesungen über die Logik, von H. C. W. Sigwart*, 3d ed. Tübingen, 1835, §§ 245, 248. — ED.]

Or, in a concrete example:

*Sempronius is either honest or dishonest.*

| AFFIRMATIVE, OR MODUS PONENDO TOLLENS — | NEGATIVE, OR MODUS TOLLENDO PONENS — |
|---|---|
| *Now Sempronius is honest;* | *Now Sempronius is not honest;* |
| *Therefore, Sempronius is not dishonest.* | *Therefore, Sempronius is dishonest.* |

(b.) Formula for a Syllogism with more than two disjunct members.

"This formula is, however, only calculated for the case in which there are only two disjunct members, that is, for the case of negative or contradictory opposition; for if the disjunct members are more than two, that is, if there is a positive or contrary opposition, there is then a twofold or manifold employment of the *Modus ponendo tollens* and *Modus tollendo ponens*, according as the affirmation and negation is determinate or indeterminate. If, in the *Modus ponendo tollens*, one disjunct member is determinately affirmed, then all the others are denied; and if several disjunct members are indeterminately affirmed except one, then only that one is denied. If, in the *Modus tollendo ponens*, a single member of the disjunction be denied, then some one of the others is determinately affirmed; and if several be denied, so that one alone is left, then this one is determinately affirmed."[1] This will appear more clearly from the following formulæ. Let the common Sumption both of the *Modus ponendo tollens* and *Modus tollendo ponens* be:

A *is either* B, *or* C *or* D.

I. THE MODUS PONENDO TOLLENS —

First Case. A *is either* B *or* C *or* D;
*Now* A *is* B;
*Therefore,* A *is neither* C *nor* D.

Second Case. A *is either* B *or* C *or* D;
*Now* A *is either* B *or* C;
*Therefore,* A *is not* D.

II. THE MODUS TOLLENDO PONENS —

First Case. A *is either* B *or* C *or* D;
*Now* A *is not* B;
*Therefore,* A *is either* C *or* D.

Second Case. A *is either* B *or* C *or* D;
*Now* A *is neither* B *nor* C;
*Therefore,* A *is* D.

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[1] Esser, *Logik*, § 93, p. 180. — ED.

Or, to take these in concrete examples, let the Common Sumption be:

*The ancients were in genius either superior to the moderns, or inferior, or equal.*

I. The Modus Ponendo Tollens —

First Case. *The ancients were in genius either superior to the moderns, or inferior, or equal;*
*Now the ancients were superior;*
*Therefore, the ancients were neither inferior nor equal.*

Second Case. *The ancients were in genius either superior to the moderns, or inferior, or equal;*
*Now the ancients were either superior or equal;*
*Therefore, the ancients were not inferior.*

II. The Modus Tollendo Ponens —

First Case. *The ancients were in genius either superior to the moderns, or inferior, or equal.*
*Now the ancients were not inferior;*
*Therefore, the ancients were either superior or equal.*

Second Case. *The ancients were in genius either superior to the moderns, or inferior, or equal.*
*Now the ancients were neither inferior nor equal;*
*Therefore, the ancients were superior.*

Such is a general view of its procedure. Now, 2°, for its principle.

2°. The principle of the Disjunctive Syllogism.

"If the essential character of the Disjunctive Syllogism consist in this, — that the affirmation or negation, or, what is a better expression, the position or sublation, of one or other of two contradictory attributes follows from the subsumption of the opposite; — there is necessarily implied in the disjunctive process, that, when of two opposite predicates one is posited or affirmed, the other is sublated or denied; and that, when the one is sublated or denied, the other is posited or affirmed. But the proposition, — that of two repugnant attributes, the one being posited, the other must be sublated, and the one being sublated, the other must be posited, — is at once manifestly the law by which the disjunctive syllogism is governed, and manifestly only an application of the law of Excluded Middle. For the *Modus ponendo tollens* there is the special rule, — If the one character be posited the other character is sublated; and for the *Modus tollendo ponens* there is the special rule, — If the one character be sublated, the other character is posited. The law of the disjunctive syllogism is here enounced, only in reference to the case in which the members of disjunction are contradictorily opposed. An opposition of contrariety is not of purely logical concernment; and a disjunctive syllogism with characters opposed in contrariety, in fact, consists of as many pure disjunctive syllogisms as there are opposing predicates."[1]

3°. I now go to the third and last matter of consideration, — the several parts of a Disjunctive Syllogism.

3°. The several parts of a Disjunctive Syllogism.

"The question concerning the special laws of a disjunctive syllogism, or, what is the same thing, what is the original and necessary form of a disjunctive syllogism, as determined by its general principle or law, — this question may be asked, not only in reference to the whole syllogism, but likewise in reference to its several parts. The original and necessary form of a disjunctive syllogism consists, as we have seen, in the reciprocal position or sublation of contradictory characters, by the subsumption of one or other. Hence it follows, that the disjunctive syllogism must, like the categorical, involve a threefold judgment, viz.: 1°, A judgment in which a subject is determined by two contradictory predicates; 2°, A judgment in which one or other of the opposite predicates is subsumed, that is, is affirmed, either as existent or non-existent; and, 3°, A judgment in which the final decision is enounced concerning the existence or non-existence of one of the repugnant or reciprocally exclusive predicates. But in these three propositions, as in the three propositions of a categorical syllogism, there can only be three principal notions — viz., the notion of a subject, and the notion of two contradictory attributes, which are generally enounced in the sumption, and of which one is posited or sublated in the subsumption, in order that in the conclusion the other may be sublated or posited. The case of contrary opposition is, as we have seen, easily reconciled and reduced to that of contradictory opposition."[2] The laws of the several parts of a disjunctive syllogism, or more properly the original and necessary form of these several parts, are given in the following paragraph:

¶ LXIV. 1°. A regular and perfect Disjunctive Syllogism must have three propositions, in which, if the sumption be simple and the disjunction purely logical, only three principal notions can be found.

Par. LXIV. The laws of the Disjunctive Syllogism.

2°, The Sumption, in relation to its quantity and quality, is always uniform, being Universal and Affirmative; but the Subsumption is susceptible of various forms in both relations.

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[1] Esser, *Logik*, § 94. — ED.

[2] Esser, *Logik*, § 95. — ED.

3°, The Conclusion corresponds in quantity with the subsumption, and is opposed to it in quality.[1]

Explication. First Rule.

The first rule is, — A regular and perfect disjunctive syllogism must have three propositions, in which, if the sumption be simple, and the disjunction purely logical, only three principal notions can be found. "Like the categorical syllogism, the disjunctive consists of a sumption, constituting the general rule; of a subsumption, containing its application; and of a conclusion, expressing the judgment inferred. Disjunctive syllogisms are, therefore, true and genuine reasonings; and if in the sumption the disjunction be contradictory, there are in the syllogism only three principal notions. In the case of contrary disjunctions, there may, indeed, appear a greater number of notions; but as such syllogisms are in reality composite, and are made up of a plurality of syllogisms with a contradictory disjunction, this objection to the truth of the rule is as little valid as the circumstance, that the subject in the sumption is sometimes twofold, threefold, fourfold, or manifold; as, for example, in the sumption — *John, James, Thomas, are either virtuous or vicious.* For this is a copulative proposition, which is composed of three simple propositions — viz. *John is,* etc. If, therefore, there be such a sumption at the head of a disjunctive syllogism, it is in this case, likewise, composite, and may be analyzed into as many simple syllogisms with three principal notions, as there are simple propositions into which the sumption may be resolved." [2]

Second Rule.

The second rule is, — The sumption is, in relation to its quantity and quality, always uniform, — being universal and affirmative; but the subsumption is susceptible of different forms in both relations. If we look, indeed, to the subject alone, it may seem to be possibly equally general or particular; for we can equally say of *some* as of *all* A, that they are either B or C. But as all universality is relative, and as the sumption is always more extensive or more comprehensive than the subsumption, it is thus true that the sumption is always general. Again, looking to the predicate, or, as it is complex, to the predicates alone, they, as exclusive of each other, appear to involve a negation. But in looking at the whole proposition, that is, at the subject, the copula, and the predicates in connection, we see at once that the copula is affirmative, for the negation involved in the predicates is confined to that term alone.[1]

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[1] Esser, *l. c.* Krug, *Logik*, § 86. — Ed.

[2] Krug, *Logik*, *l. c.* — Ed.

Third Rule.

In regard to the third rule, which enounces, — That the conclusion should have the same quantity with the subsumption, but an opposite quality, — it is requisite to say nothing, as the first clause is only a special application of the rule common to all syllogisms, that the conclusion can contain nothing more than the premises, and must, therefore, follow the weaker part; and the second is self-evident, as only a special application of the principle of Excluded Middle, for, on this law, if one contradictory be affirmed in the subsumption, the other must be denied in the conclusion, and if one contradictory be denied in the subsumption, the other must be affirmed in the conclusion.

The Disjunctive Syllogism of Comprehension and Extension.

The Disjunctive, like every other species of syllogism, may be either a reasoning in the quantity of Comprehension, or a reasoning in the quantity of Extension. The contrast, however, of these two quantities is not manifested in the same signal manner in the disjunctive as in the categorical deductive syllogism, more especially of the first figure. In the categorical deductive syllogism, the reasonings in the two counter quantities are obtrusively distinguished by a complete conversion, not only of the internal significance, but of the external appearance of the syllogism. For not only do the relative terms change places in the relation of whole and part, but the consecution of the antecedents is reversed; the minor premise in the one syllogism becoming the major premise in the other. This, however, is not the case in disjunctive syllogisms. Here the same proposition is, in both quantities, always the major premise; and the whole change that takes place in converting a disjunctive syllogism of the one quantity into a disjunctive syllogism of the other, is in the silent reversal of the copula from one of its meanings to another. This, however, as it determines no apparent difference in single propositions, and as the disjunctive sumption remains always the same proposition, out of which the subsumption and the conclusion are evolved, in the one quantity as in the other, — the reversal of the sumption, from extension to comprehension, or from comprehension to extension, occasions neither a real nor an apparent change in the syllogism. Take, for example, the disjunctive syllogism:

Examples.

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[1] See Krug, *Logik*, § 86, Anm. 2. Ed. — [Bachmann, *Logik*, § 141, p. 351. *Contra*: Twesten, *Logik*, § 137, ed. 1825, p. 119. Esser. *Logik*, § 95. Derodon, *Logica Restituta*, p. 676.] [Propositio Disjunctiva nullam habet quantitatem nisi suarum partium . . . sicut Propositio Hypothetica habet tantum quantitatem suarum partium." See above, p. 174, and note 1. — Ed.]

*Plato is either learned or unlearned;*
*But Plato is learned.*
*Therefore, Plato is not unlearned.*

Now let us explicate this into an intensive and into an extensive syllogism. As in Intensive Syllogism it will stand:

*Plato comprehends either the attribute learned or the attribute unlearned;*
*But Plato comprehends the attribute learned;*
*Therefore, etc.*

As an Extensive Syllogism it will stand:

*Plato is contained either under the class learned or the class unlearned;*
*But Plato is contained under the class learned;*
*Therefore, etc.*

From this it appears, that, though the difference of reasoning in the several quantities of comprehension and extension obtains in disjunctive, as in all other syllogisms, it does not, in the disjunctive syllogism, determine the same remarkable change in the external construction and consecution of the parts, which it does in categorical syllogisms.

# LECTURE XVIII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO INTERNAL FORM.

### B. CONDITIONAL.—HYPOTHETICAL AND HYPOTHETICO-DISJUNCTIVE.

Having now considered Categorical and Disjunctive Syllogisms, the next class of Reasonings afforded by the difference of Internal or Essential form is the Hypothetical; and the general nature of these syllogisms is expressed in the following paragraph:

Par. LXV. 2. Hypothetical syllogism,—its general character.

> ¶ LXV. An Hypothetical Syllogism is a reasoning whose form is determined by the law of Reason and Consequent. It is, therefore, regulated by the two principles of which that law is the complement,—the one,—With the reason, the consequent is affirmed; the other,—With the consequent, the reason is denied: and these two principles severally afford the condition of its Affirmative or Constructive, and of its Negative or Destructive form (*Modus ponens et Modus tollens*). The sumption or general rule in such a syllogism is necessarily an hypothetical proposition (*If* A *is*, *then* B *is*). In such a proposition it is merely enounced that the prior member (A) and the posterior member (B) stand to each other in the relation of reason and consequent, if existing, but without it being determined whether they really exist or not. Such determination must follow in the subsumption and conclusion; and that, either by the absolute affirmation of the

antecedent in the subsumption, and the illative affirmation of the consequent in the conclusion (the *modus ponens*); or by the absolute negation of the consequent in the subsumption, and the illative negation of the antecedent in the conclusion (the *modus tollens*).[1] The general form of an hypothetical syllogism[2] is, therefore, the following:

Common Sumption — *If* A *is, then* B *is;*

| 1, | 2, |
|---|---|
| MODUS PONENS: | MODUS TOLLENS: |
| *But* A *is;* | *But* B *is not;* |
| *Therefore,* B *is.* | *Therefore,* A *is not.* |

Or,

A B

1) MODUS PONENS — *Si poteris possum; sed tu potes; ergo ego possum.*

B A

2) MODUS TOLLENS — *Si poteris possum; non possum: nec potes ergo.*[3]

Explication.

In illustrating this paragraph, I shall consider, 1°, This species of syllogism in general; 2°, Its peculiar principle: and, 3°, Its special laws.

1°. Hypothetical syllogism in general. Contains three propositions.

1°. "Like every other species of simple syllogism, the Hypothetical is made up of three propositions, — a sumption, a subsumption, and a conclusion. There must, in the first place, be an hypothetical proposition holding the place of a general rule, and from this proposition the other parts of the syllogism must be deduced. This first proposition, therefore, contains a sumption. But as this proposition contains a relative and correlative member, — one member, the relative clause, enouncing a thing as conditioning; the other, the correlative clause, enouncing a thing as conditioned; and as the whole proposition enounces merely the dependency between these relatives, and judges nothing in regard to their existence considered apart and in themselves, — this enouncement must be made in a second proposition, which shall take out of the sumption one or other of its relatives, and categorically enounce its existence or its non-existence. This second proposition contains, therefore, a subsumption; and, through this subsumption, a judgment is likewise determined, in a third proposition, with regard to the other relative. This last proposition, therefore, contains the conclusion proper of the syllogism."

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[1] [For use of terms *ponens* and *tollens*, see Boethius, *De Syllogismo Hypothetico*, *Opera* p. 611. Wolf *Phil. Rat.* § 409, 410. Mark Duncan uses the terms "a positione ad positionem," and "a remotione ad remotionem." [*Institutiones Logicæ*, L. iii. c. 6, § 4, p. 240. Cf. p. 213, Salmurii, 1812. — ED.]

[2] [On the Hypothetical Syllogism in general, see Ammonius, *In De Interp.*, Proœm., f. 3, Venetiis, 1546. Philoponus, *In Anal. Prior.*, l. c. 23, f. 60, Venet., 1536. Magentinus, *In Anal. Prior.*, f. 16, b. Alex. Aphrodisiensis, *In Anal. Prior.*, ff. 87, 88, 109, 130. Ald. 1520. *In Topica*, f. 65, Ald., 1513. Anonymous Author, *On Syllogisms*, f. 44, ed. 1536. Scheibler, *Opera Logica*, pars iv p. 518. Bolzano, *Wissenschaftslehre*, *Logik*, ii. p. 590 Waitz, *Organon*, *In An. Prior.*, i. c 23.]

[3] These lines are the Author's own. — ED

In a hypothetical syllogism there is competent a twofold kind of reasoning,—the *modus ponens* and *modus tollens*.

"But as the sumption in an hypothetical syllogism contains two relative clauses, — an antecedent and a consequent, — it, therefore, appears double; and as either of its two members may be taken in the subsumption, there is, consequently, competent a twofold kind of reasoning. For we can either, in the first place, conclude from the truth of the antecedent to the truth of the consequent; or, in the second place, conclude from the falsehood of the consequent to the falsehood of the antecedent. The former of these modes of hypothetical inference constitutes what is sometimes called the *Constructive Hypothetical*, but more properly the *Modus Ponens*: — the latter what is sometimes called the *Destructive Hypothetical*, but more properly the *Modus Tollens*."[1] As examples of the two modes:

Modus Ponens — *If Socrates be virtuous, he merits esteem;*
*But Socrates is virtuous:*
*Therefore, he merits esteem.*
Modus Tollens — *If Socrates be virtuous, he merits esteem;*
*But Socrates does not merit esteem;*
*Therefore, he is not virtuous.*[2]

So much for the character of the Hypothetical Syllogism in general. I now proceed to consider its peculiar principle.

2°, "If the essential nature of an Hypothetical Syllogism consist in this, — that the subsumption affirms or denies one or other of the two parts of a thought, standing to each other in the relation of the thing conditioning and the thing conditioned, it will be the

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[1] Krug, *Logik*, § 81, Anm. 1, p. 254. Compare Esser, *Logik*, § 90, p. 173. — Ed.

[2] [Nomenclature of Theophrastus, Eudemus, and other Peripatetics, in regard to Hypothetical Syllogism, in contrast with that of the Stoics.

Πράγματα νοήματα φωναὶ (Peripatetic), are called by the Stoics respectively, τυγχάνοντα ἐκφορικά, λεκτά.

Take this Hypothetical Syllogism:

*If it be day, the sun is on the earth;*
*But it is day;*
*Therefore, the sun is on the earth.*

Here, *If it be day* is called τὸ ἡγούμενον, both by Peripatetics and by Stoics; *the sun is on the earth*, is called τὸ ἑπόμενον by Peripatetics, τὸ λῆγον by Stoics. The whole, *If it be day, the sun is on the earth*, is called τὸ συνημμένον by Peripatetics, τὸ τροπικόν by Stoics: *But it is day*, is μετάληψις to Peripatetics, πρόσληψις to Stoics. *Therefore, the sun is on the earth*, is συμπέρασμα to Peripatetics, ἐπιφορά to Stoics. See Philoponus, *In Anal. Prior.*, L. i c. 28, f 60 a, ed. Venet. 1536. Brandis, *Scholia*, p 169. Cf. Anonymous Author, *On Syllogisms*, f. 44.]

2°. Its peculiar principle.—The law of Reason and Consequent.

law of an hypothetical syllogism, that, — If the condition or antecedent be affirmed, so also must be the conditioned or consequent, and that if the conditioned or consequent be denied, so likewise must be the condition or antecedent. But this is manifestly nothing else than the law of Sufficient Reason, or of Reason and Consequent."[1] The principle of this syllogism is thus variously enounced, — *Posita conditione, ponitur conditionatum; sublato conditionato, tollitur conditio.* Or otherwise, — *A ratione ad rationatum, a negatione rationati ad negationem rationis, valet consequentia.* The one alternative of either rule being regulative of *modus ponens*, the other of the *modus tollens*.[2]

How enounced.

Why we cannot conclude from the truth of the consequent to the truth of the antecedent, and from the falsehood of the antecedent to the falsehood of the consequent.

"But here it may be asked, why, as we conclude from the truth of the antecedent to the truth of the consequent (*a ratione ad rationatum*), and from the falsehood of the consequent to the falsehood of the antecedent (*a negatione rationati ad negationem rationis*), can we not conversely conclude from the truth of the consequent to the truth of the antecedent, and from the falsehood of the antecedent to the falsehood of the consequent? In answer to this question, it is manifest that this could be validly done, only on the following supposition, namely, if every consequent had only one possible antecedent; and if, from an antecedent false as considered absolutely and in itself, it were impossible to have consequents true as facts.

"Thus, in the first place, it is incompetent to conclude that because B exists, that is, because the consequent member of the sumption, considered as an absolute proposition, is true, therefore the supposed reason A exists, that is, therefore the alleged antecedent member must be true; for B may have other reasons besides A, such as C or D. In like manner, in the second place, we should not be warranted to infer, that because the supposed reason A is unreal, and the antecedent member false, therefore the result B is also unreal, and the consequent member false; for the existence of B might be determined by many other reasons than A."[3] For example:

*If there are sharpers in the company, we ought not to gamble;*
*But there are no sharpers in the company;*
*Therefore, we ought to gamble.*

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[1] Esser, *Logik*, § 91. p. 174. — Ed.

[2] See Kant, *Logik*, §§ 75, 76. Krug, *Logik*, § 82. — Ed

[3] Krug, *Logik*, § 82, p. 256. — Ed.

Here the conclusion is as false as if we conversely inferred, that *because we ought not to gamble, there are no sharpers in the room.*

Conversion of Hypothetical to Categorical Syllogisms, is 1°, Unnecessary.

"Logicians have given themselves a world of pains in the discovery of general rules for the conversion of Hypothetical Syllogisms into Categorical.[1] But, in the first place, this is unnecessary, in so far as it is applied to manifest the validity of an hypothetical syllogism; for the hypothetical syllogism manifests its own validity with an evidence not less obtrusive than does the categorical, and, therefore, it stands in no need of a reduction to any higher form, as if it were of this a one-sided and accidental modification. With equal propriety might we inquire, how a categorical syllogism is to be converted into an hypothetical.

2°, Not always possible.

In the second place, this conversion is not always possible, and, therefore, it is never necessary. In cases where the sumption of an hypothetical syllogism contains only three notions, and where, of these three notions, one stands to the other two in the relation of a middle term, — in these cases, an hypothetical syllogism may without difficulty be reduced to categoricals. Thus, when the formula — *If* A *is*, *then* B *is*, signifies — *If* A *is* C, *then* A *is also* B: that is, A *is* B, *inasmuch as it is* C; — in this case the categorical form is to be viewed as the original, and the hypothetical as the derivative."[2] For example:

*If Caius be a man, then he is mortal;*
*But Caius is a man;*
*Therefore, he is mortal.*

Here the notion *man* is regarded as comprehending in it, or as contained under, the notion *mortal;* and as being comprehended in, or as containing under it, the notion *Caius;* it can, therefore, serve as middle term in the categorical syllogism to connect the two notions *Caius* and *mortal.* Thus:

*Man is mortal;*
*Caius is a man;*
*Therefore, Caius is mortal.*

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[1] [For the reduction of hypotheticals, see Wolf, *Philos. Rat.*, § 412. Reusch, *Systema Logicum*, § 563. Molinæus, *Elementa Logica*, L. i. tract. iii. c. 1, p. 95. Keckermann, *Opera*, t. i. pp. 266, 767. Crellius, *Isagoge*, L. iii c. 17, p. 243 Kiesewetter, *Allgemeine Logik*, i. § 230, p. 115. Esser, *Logik*, §§ 99, 100. Against, see Krug, *Logik*, p. 356, and *Lexikon*, iii. p 559 Fries, *Logik*, § 62, p. 267. Bachmann, *Logik*, § 89, Anm. 2. (In part), Aristotle, *Anal. Prior.*, L. i. c. 44, p. 274. ed. Pacii. (In part), Pacius, *In Arist., Organon, loc. cit.*, p 194 ]

[2] Krug, *Logik*, p. 258, Anm , 3 — Ed.

"In such cases it requires only to discover the middle term, in order to reduce the hypothetical syllogism to a categorical form; and no rules are requisite for those who comprehend the nature of the two kinds of reasoning.

"But in those cases where the sumption of an hypothetical syllogism contains more than three notions, so that the formula, *If* A *is, then* B *is*, signifies, *If* A *is* C, *then is* B *also* D, — in such cases, an easy and direct conversion is impossible, as a categorical syllogism admits of only three principal notions. To accomplish a reduction at all, we must make a circuit through a plurality of categorical syllogisms before we can arrive at an identical conclusion, — a process which, so far from tending to simplify and explain, conduces only to perplex and obscure.[1]

Hypothetical syllogisms of one form easily convertible into that of another.

"On the other hand, we can always easily convert an hypothetical syllogism of one form into another, — the *modus ponens* into the *modus tollens*, — the *modus tollens* into the *modus ponens*. This is done by a mere contraposition of the antecedent and consequent of the sumption. Thus, the Ponent or Constructive Syllogism:

*If Socrates be virtuous, then he merits esteem;*
*But Socrates is virtuous;*
*Therefore, he merits esteem,*

may thus be converted into a Tollent or Destructive syllogism:

*If Socrates do not merit esteem, then he is not virtuous;*
*But he is virtuous;*
*Therefore, he merits esteem.*

"This latter syllogism, though apparently a Constructive syllogism, is in reality a Destructive. For, *in modo ponente*, we conclude from the truth of the antecedent to the truth of the consequent: but here we really conclude from the falsehood of the consequent to the falsehood of the antecedent."[2] This latter syllogism, if fully expressed, would indeed be as follows:

*If Socrates do not merit esteem, he is not virtuous;*
*But Socrates is not not virtuous;*
*Therefore, he does not not merit esteem.*

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[1] Compare Mark Duncan, *Instit. Log*, L. iv. c. 6. § 1, p. 210 *et seq.* Derodon, *Logica Restituta, De Argumentatione*, § 106, p. 672. — Ed. [Bolzano, *Wissenschaftslehre*, *Logik*, ii. 266, p 562.]

[2] Krug, *Logik*, p 259, 260. — Ed.

3°. I now go on to a statement and consideration of the special rules by which an hypothetical syllogism is governed.

Par. LXVI. 3°, Special Rules of Hypothetical Syllogism.

¶ LXVI. The special rules by which an Hypothetical Syllogism is regulated are the following:

I. A regular and perfect hypothetical syllogism must have three propositions, in which, however, more than three principal notions may be found.

II. The Sumption is, in regard to quantity and quality, uniform, being always Definite and Affirmative; whereas the Subsumption varies in both relations.

III. The Conclusion is regulated in quantity and quality by that member of the sumption which is not subsumed; *in modo ponente*, they are congruent; *in modo tollente*, they are opposed.[1]

Explication. First Rule. This regulates the general form of the hypothetical syllogism.

"The question touching the special laws of the hypothetical syllogism, or, what is the same thing, the question touching the original and necessary form of the hypothetical syllogism, as determined by its general principle, — the law of Reason and Consequent, — this question may be referred both to the whole reasoning and to its several parts. The original and necessary form of the hypothetical syllogism, as determined by its general principle, we have already considered. From this, as already noticed, it follows as a corollary, that the hypothetical, like every other syllogism, must contain a threefold judgment: 1°, A judgment whose constituent members stand to each other in the relation of reason and consequent; 2°, A judgment which subsumes as existent, or non-existent, one or other of these constituent members, standing to each other in the relation of reason and consequent; and, 3°, Finally, a judgment decisive of the existence or non-existence of that constituent member which was not subsumed in the second judgment. In these three propositions — sumption, subsumption, and conclusion — there may, however, be found more than three principal notions; and this is always the case when the sumption contains more than three principal terms, as is exemplified in a proposition like the following: *If God reward virtue, then will virtuous men be also happy.* Here, however, it must, at the same time, be understood, that this proposition, in which a larger plurality of notions than three is apparent, contains, however, only the thought of one antecedent and of one consequent; for a single consequent supposes a whole antecedent, how complex soever it may be, and a single antecedent involves in it a whole consequent, though made up of any number of parts. Both of these possibilities are seen in the example, now adduced, of an hypothetical judgment, in which there occur more than three principal notions. If, however, an hypothetical proposition involve only the thought of a single antecedent and of a single consequent, it will follow that any hypothetical syllogism consists not of more than three, but of less than three, capital notions; and, in a rigorous sense, this is actually the case."[1] On this ground, accordingly, some logicians of great acuteness have viewed the hypothetical syllogism as a syllogism of two terms and of two propositions."[2] This is, however, erroneous; for, in an hypothetical syllogism, there are virtually three terms." "That under this form of reasoning a whole syllogism can be evolved out of not more than two capital notions depends on this, — that the two constituent notions of an hypothetical syllogism present a character in the sumption altogether different from what they exhibit in the subsumption and conclusion. In the sumption these notions stand bound together in the relation of reason and consequent, without, however, any determination in regard to the reality or unreality of one or other; if one be, then the other is, is all that is enounced. In the subsumption, on the other hand, the existence or non-existence of what one or other of these notions comprises is expressly asserted, and thus the concept, expressly affirmed or expressly denied, manifestly obtains, in the subsumption, a wholly different significance from what it bore when only enounced as a condition of reality or unreality; and, in like manner, that notion which the subsumption left untouched, and concerning whose existence or nonexistence the conclusion decides, obtains a character altogether different in the end from what it presented in the beginning. And thus, in strict propriety, there are found only three capital notions in an hypothetical syllogism, namely, 1°, The notion of the reciprocal dependence of subject and predicate, 2°, The notion of the reality or unreality of the antecedent, and, 3°, The notion of the reality or unreality of the consequent."[3] So much in explanation

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[1] Krug, *Logik*, § 83. — Ed.

Ground on which the Hypothetical Syllogism has been regarded as having only two terms and two propositions.

This view erroneous.

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[1] Esser, *Logik*, § 92, p. 175-6. — Ed.

[2] See Kant, *Logik*, § 75. Kant's view is combatted by Krug, *Logik*, § 83. — Ed. [A view similar to that of Kant is held by Weiss, *Logik*, §§ 210, 251. Herbart, *Logik*, § 65. Fischer, *Logik*, § 100, p. 137.]

[3] Esser, *loc. cit.* — Ed.

of the first special law, or that regulative of the general form of the hypothetical syllogism.

Second Rule.

The second law states the conditions of these two premises, — that the sumption, in reference to its quantity and quality, is uniform, being always definite, that is, singular or universal, and affirmative; while the subsumption, in both relations, remains free.

That the sumption is always definite to be understood in a qualified sense.

In regard to the sumption, when it is said that it is always definite, that is, singular or universal, and affirmative, this must be understood in a qualified sense. Touching the former, it may indeed be said that quantity may be altogether thrown out of account in an hypothetical syllogism.[1] For a reason being once supposed, its consequent is necessarily affirmed without limitation; and, by the disjunction, the extension or comprehension of the subject is so defined, that the opposite determinations must together wholly exhaust it. It may, indeed, sometimes appear as if what was enounced in an hypothetical sumption were enounced only of an indefinite number, — of some; and it, consequently, then assumes the form of a particular proposition. For instance, *If some men are virtuous, then some other men are vicious.* But here it is easily seen that such judgments are of an universal or exhaustive nature. In the proposition adduced, the real antecedent is, *If some men (only) are virtuous;* the real consequent is, *then all other men are vicious.* It would, perhaps, have been better had the relative totality of the major proposition of a hypothetical syllogism been expressed by another term than *universal.*[2] For the same reason it is, that the difference of extensive and comprehensive quantity determines no external change in the expression of an hypothetical syllogism; for every hypothetical syllogism remains the same, whether we read it in the one quantity or in the other.

That the sumption is always affirmative.

In regard to the other statement of the rule, that the sumption of an hypothetical syllogism must be always affirmative, — this, likewise, demands a word of illustration. It is true that the antecedent or the consequent of such a sumption may be negative as well as affirmative; for example, *If Caius be not virtuous, he is not entitled to respect; If the sun be not risen, it is not day.* But here the proposition, as an hypothetical judgment, is and must be affirmative. For the affirmative in such a judgment is contained in the positive assertion of the dependence of consequent or antecedent; and if such a dependence be not affirmed, an hypothetical judgment cannot exist.

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[1] [See Alexander Aphrodisiensis, *In Anal. Prior*, f. 5 a. *Scholia*, ed. Brandis, p 144. Derodon, *Logica Restituta*, p. 688.] [Compare above, pp. 188, 236. — ED.]

[2] See above p. 188. Compare Esser, *Logik*, § 92, p. 177. — ED.

The subsumption.

In regard to what is stated in the rule concerning the conditions of the subsumption, — that this may either be general or particular, affirmative or negative, — it will not be requisite to say anything in illustration. For, as the subsumption is merely an absolute assertion of a single member of the sumption, and as such member may, as an isolated proposition, be of any quantity or any quality, it follows that the subsumption is equally unlimited.

Third Rule.

In reference to the third rule, which states that the conclusion is regulated in quantity and quality by that member of the sumption which is not subsumed, and this *in modo ponente* by congruence, *in modo tollente* by opposition, it will not be requisite to say much.

"In the conclusion, the latter clause of the sumption is affirmed *in modo ponente*, because the former is affirmed in the subsumption. In this case, the conclusion has the same quantity and quality as the clause which it affirms. *In modo tollente* the *antecedent* of the sumption is denied in the conclusion, because in the subsumption the *consequent* clause had been denied. There thus emerges an opposition between that clause, as denied in the conclusion, and that clause as affirmed in the sumption. The conclusion is thus always opposed to the antecedent of the sumption in quantity, or in quality, or in both together, according as this is differently determined by the different constitution of the propositions. For example:

*If some men were omniscient, then would they be as Gods;*
*But no man is a God;*
*Therefore, some men are not omniscient, that is, no man is omniscient.*"[1]

3 Hypothetico-disjunctive or Dilemmatic Syllogisms.

I now proceed to the consideration of the last class of syllogisms afforded by the Internal Form, — the class of Dilemmatic or Hypothetico-disjunctive Syllogisms, and I comprise a general enunciation of their nature in the following paragraph.

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[1] Krug, *Logik*, § 83, p. 265. — Ed.

Par. LXVII. Hypothetico-disjunctive Syllogism or Dilemma.

¶ LXVII. If the sumption of a syllogism be at once hypothetical and disjunctive, and if, in the subsumption, the whole disjunction, as a consequent, be sublated, in order to sublate the antecedent in the conclusion; such a reasoning is called an *Hypothetico-disjunctive Syllogism*, or a *Dilemma*. The form of this syllogism is the following.

> *If* A *exist, then either* B *or* C *exists;*
> *But neither* B *nor* C *exists;*
> *Therefore,* A *does not exist.*[1]

Explication.

We have formerly seen that an hypothetical may be combined with a disjunctive judgment; and if a proposition of such a character be placed at the head of a reasoning, we have the Hypothetico-disjunctive Syllogism or Dilemma. This reasoning is properly an hypothetical syllogism, in which the relation of the antecedent to the consequent is not absolutely affirmed, but affirmed through opposite and reciprocally exclusive predicates. *If* A *exist, then either* B *or* C *exist.* The sumption is thus at once hypothetical and disjunctive. The subsumption then denies the disjunctive members contained in the consequent or posterior clause of the sumption. *But neither* B *nor* C *exist.* And then the inference is drawn in the conclusion, that the reason given in the antecedent or prior clause of the sumption must likewise be denied. *Therefore* A *does not exist.*[2] For example:

> *If man be not a morally responsible being, he must want either the power of recognizing moral good (as an intelligent agent), or the power of willing it (as a free agent).*
> *But man wants neither the power of recognizing moral good (as an intelligent agent), nor the power of willing it (as a free agent);*
> *Therefore, man is a morally responsible being.*

Designations of the Hypothetico-disjunctive Syllogism.

"An hypothetico-disjunctive syllogism is called the *dilemma* or *horned syllogism* in the broader acceptation of the term (*dilemma*, *ceratinus*, *cornutus sc. syllogismus*). We must not, however, confound the *cornutus* and *crocodilinus* of the ancients with our hypothetico-disjunctive syllogism. The former were sophisms of a particular kind, which we are hereafter to consider; the latter is a regular and legitimate form of reasoning. In regard to the application of the terms, it is called the *cornutus* or *horned syllogism*, because in the sumption the disjunctive members of the consequent are opposed like horns to the assertion of the adversary; with these, we throw it from one side to the other in the subsumption; in order to toss it altogether away in the conclusion. If the disjunction has only two members, the syllogism is then called a *dilemma* (*bicornis*) in the strict and proper signification, literally *double sumption*. Of this the example previously given is an instance. If it has three, four, or five members, it is called *trilemma* (*tricornis*), *tetralemma* (*quadricornis*), *pentalemma* (*quinquecornis*); if more than four, it is, however, usually called *polylemma* (*multicornis*). But, in the looser signification of the word, *Dilemma* is a generic expression for any or all of these."[1]

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[1] Krug, *Logik*, § 87. — Ed. [*Contra*, see Troxler, *Logik*, ii. p. 103 n*. That the Dilemma is a negative induction, see Wallis, *Logica*, L. iii. c. 19, p. 218. Cf. Fries, *Logik*, § 60, p. 257. Aldrich, *Rudimenta Logicæ*, c. iv. § 3, p. 107, Oxford, 1852. Platner, *Philosophische Aphorismen*, i. § 583, p. 280.]

[2] Krug, *loc. cit.* — Ed.

Rules for sifting a proposed Dilemma.

"Considered in itself, the hypothetico-disjunctive syllogism is not to be rejected, for in this form of reasoning we can conclude with cogency, provided we attend to the laws already given in regard to the hypothetical and disjunctive syllogisms. It is not, however, to be denied, that this kind of syllogism is very easily abused for the purpose of deceiving, through a treacherous appearance of solidity, and from terrifying a timorous adversary by its horned aspect. In the sifting of a proposed dilemma, we ought, therefore, to look closely at the three following particulars: — 1°, Whether a veritable consequence subsists between the antecedent and consequent of the sumption; 2°, Whether the opposition in the consequent is thorough-going and valid; and, 3°, Whether in the subsumption the disjunctive members are legitimately sublated. For the example of a dilemma which violates these conditions, take the following:

*If virtue were a habit worth acquiring, it must insure either power, or wealth, or honor, or pleasure;*

*But virtue insures none of these;*

*Therefore, virtue is not a habit worth attaining.*

"Here: — 1°. The inference in general is invalid: for a thing may be worth acquiring, though it does not secure any of those advantages enumerated. 2°. The disjunction is incomplete; for there are other goods which virtue insures, though it may not insure those here opposed. 3°. The subsumption is also vicious; for virtue has frequently obtained for its possessors the very advantages here denied."[2]

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[1] Krug, *loc. cit.* Anm., 2. — Ed. [Cf. Keckermann, *Opera*, t. i. pp. 263, 769.]

[2] Krug, *Logik*, § 87. Anm 3, p. 281 — Ed.

Before leaving this subject, it may be proper to make two observations. The first of these is, that though it has been stated that Categorical Syllogisms are governed by the laws of Identity and Contradiction, that Disjunctive Syllogisms are governed by the law of Excluded Middle, and that Hypothetical Syllogisms are governed by the law of Reason and Consequent, — this statement is not, however, to be understood as if, in these several classes of syllogism, no other law were to be found in operation except that by which their peculiar form is determined. Such a supposition would be altogether erroneous, for in all of these different kinds of syllogism, besides the law by which each class is principally regulated, and from which it obtains its distinctive character, all the others contribute, though in a less obtrusive manner, to allow and to necessitate the process.

The whole of the logical laws, — Identity, Contradiction, Excluded Middle, and Reason and Consequent, — are operative in each form of syllogism.

Thus, though the laws of Identity and Contradiction are the laws which preëminently regulate the Categorical Syllogism, — still without the laws of Excluded Middle, and Reason and Consequent, all inference in these syllogisms would be impossible. Thus, though the law of Identity affords the basis of all affirmative, and the law of Contradiction the basis of all negative, syllogisms, still it is the law of Excluded Middle which legitimates the implication, that, besides affirmation and negation, there is no other possible quality of predication. In like manner, no inference in categorical reasoning could be drawn, were we to exclude the determination of Reason and Consequent. For we only, in deductive reasoning, conclude of a part what we assume of a whole, inasmuch as we think the whole as the reason, — the condition, — the antecedent, — by which the part, as a consequent, is determined; and we only, in inductive reasoning, conclude of the whole what we assume of all the parts, inasmuch as we think all the parts as the reason, — the condition, — the antecedent, — by which the whole, as a consequent, is determined.

This illustrated 1. In Categorical Syllogisms.

In point of fact, logically or formally, the law of Identity and the law of Reason and Consequent in its affirmative form, are at bottom the same; the law of Identity constitutes only the law of Reason and Consequent, — the two relatives being conceived simultaneously, that is, as subject and predicate; the law of Reason and Consequent constitutes only the law of Identity, the two relatives being conceived in sequence, that is, as

The law of Identity formally the same with that of Reason and Consequent.

antecedent and consequent.[1] And as the law of Reason and Consequent, in its positive form, is only that of Identity in movement; so, in its negative form, it is only that of Contradiction in movement.

2. In Disjunctive Syllogisms.

In Disjunctive Syllogisms, again, though the law of Excluded Middle be the principle which bestows on them their peculiar form, still these syllogisms are not independent of the laws of Identity, of Contradiction, and of Reason and Consequent. The law of Excluded Middle cannot be conceived apart from the laws of Identity and Contradiction; these it implies, and, without the principle of Reason and Consequent, no movement from the condition to the conditioned, that is, from the affirmation or negation of one contradictory to the affirmation or negation of the other, would be possible.

3. In Hypothetical Syllogisms.

Finally, in Hypothetical Syllogisms, though the law of Reason and Consequent be the prominent and distinctive principle, still the laws of Identity, Contradiction, and Excluded Middle are also there at work. The law of Identity affords the condition of Affirmative or Constructive, and the law of Contradiction of Negative or Destructive, Hypotheticals; while the law of Excluded Middle limits the reasoning to these two modes alone.

Difficulty in regard to the doctrine, that all reasoning is either from whole to part or from the parts to the whole, — obviated.

The second observation I have to make, is one suggested by a difficulty which has been proposed to me in regard to the doctrine, that all reasoning is either from whole to part, or from the parts to the whole. The difficulty, which could only have presented itself to an acute and observant intellect, it gave me much satisfaction to hear proposed; and I shall have still greater gratification, if I should be able to remove it, by showing in what sense the doctrine advanced is to be understood. It was to this effect: — In Categorical Syllogisms, deductive and inductive, intensive and extensive, the reasoning is manifestly from whole to part, or from the parts to the whole, and, therefore, in regard to the doctrine in question, as relative to categorical reasoning, there was no difficulty. But this was not the case in regard to Hypothetical Syllogisms. These are governed by the law of Reason and Consequent, and it does not appear how the antecedent and consequent stand to each other in the relation of whole and part.

In showing how the reason and the consequent are to be viewed as whole and part, it is necessary, first, to repeat, that the reason or antecedent means the *condition*, that is, the complement of all, without which something else would not be; and the consequent means the *conditioned*, that is, the complement of all that is determined to be by the existence of something else. You must further bear in mind, that we have nothing to do with things standing in the relation of reason and consequent, except in so far as they are thought to stand in that relation; it is with the *ratio cognoscendi*, not with the *ratio essendi*, that we have to do in Logic; the former is, in fact, alone properly denominated *reason* and *consequent*, while the latter ought to be distinguished as *cause* and *effect.* The *ratio essendi*, or the law of Cause and Effect, can indeed only be thought under the form of the *ratio cognoscendi*, or of the principle of Reason and Consequent; but as the two are not convertible, inasmuch as the one is far more extensive than the other, it is proper to distinguish them, and, therefore, it is to be recollected, that Logic is alone conversant with the *ratio cognoscendi*, or the law of Reason and Consequent, as alone conversant with the form of thought.

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[1] [Compare Köppen, *Darstellung des Wesens der Philosophie*, p. 102 *et seq.*, Nürnberg, 1810.]

This difficulty considered with respect to Hypothetical syllogisms.

Antecedent and Consequent are equal to Condition and Conditioned.

This being understood, if the reason be conceived as that which conditions, in other words, as that which contains the necessity of the existence of the consequent; it is evident that it is conceived as containing the consequent. For, in the first place, a reason is only a reason if it be a sufficient reason, that is, if it comprise all the conditions, that is, all that necessitates the existence, of the consequent; for if all the conditions of anything are present, that thing must necessarily exist, since, if it do not exist, then some condition of its existence must have been wanting, that is, there was not a sufficient reason of its existence, which is contrary to the supposition. In the second place, if the reason, the sufficient reason, be conceived as comprising all the conditions of the existence of the consequent, it must be conceived as comprising the consequent together; for if the consequent be supposed to contain in it any one part not conceived as contained in the reason, it may contain two, three, or any number of parts equally uncontained in the reason, consequently it may be conceived as altogether uncontained in the reason. But this is to suppose that it has no reason, or that it is not a consequent; which again is contrary to the hypothesis. The law of Reason and Consequent, or of the Condition and the Conditioned, is only in fact another expression of Aristotle's law, that the whole is necessarily conceived as prior

Hence the reason or condition must contain the consequent.

The Law of Reason and Consequent only another expression of Aristotle's law, that the whole is necessarily conceived as prior to the part.

Aristotle's law criticized.

Whole and Parts respectively may be viewed in thought either as the conditioning or as the conditioned.

to the part, *totum parte prius esse, necesse est.*[1] It is, however, more accurate; for Aristotle's law is either inaccurate or ambiguous. Inaccurate, for it is no more true to say that the whole is necessarily prior in the order of thought to the parts, than to say that the parts are necessarily prior in the order of thought to the whole. Whole and parts are relatives, and as such are necessarily coëxistent in thought. But while each implies the other, and the notion of each necessitates the notion of the other, we may, it is evident, view either, in thought, as the conditioning or antecedent, or as the conditioned or consequent. Thus, on the one hand, we may regard the whole as the prior and determining notion, as containing the parts, and the parts as the posterior and determined notion, as contained by the whole. On the other hand, we may regard the parts as the prior and determining notion, as constituting the whole, and the whole as the posterior and determined notion, as constituted by the parts.[2] In the former case, the whole is thought as the reason, the parts are thought as the consequent; in the latter, the parts are thought as the reason, the whole is thought as the consequent. Now, in so far as the whole is thought as the reason, there will be no difficulty in admitting that the reason is conceived as containing the parts. But it may be asked, how can the parts, when thought as the reason, be said to contain the whole? To this the answer is easy. All the parts contain the whole, just as much as the whole contains all the parts. Objectively considered, the whole does not contain all the parts, nor do all the parts contain the whole, for the whole and all the parts are precisely equivalent, absolutely identical. But, subjectively considered, that is, as mere thoughts, we may either think the whole by all the parts, or think all the parts by the whole. If we think all the parts by the whole, we subordinate the notion of the parts to the notion of

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[1] *Metaphysics*, iv. 11. Aristotle, however, allows a double relation. The whole, when conceived as actually constituted, must be regarded as prior to the parts, for the latter only exist as parts in relation to the whole. Potentially, however, the parts may be regarded as prior; for the whole might be destroyed as a system without the destruction of the parts. Where the whole is not conceived as actually constituted, this relation is reversed. Thus Aristotle's rule may be regarded as coëxtensive with that given in the text. See the next note. — Ed.

[2] This is substantially expressed by Aristotle, *l. c.*, whose distinction is applicable either to the order of thought or to that of existence. κατὰ γένεσιν (*i. e.*, regarded as a complete system), the whole is actually, the parts are only potentially, existent; while, on the other hand, κατὰ φθοράν (*i. e.*, regarded as disorganized elements), the parts exist actually, the whole only potentially. — Ed.

Application of this doctrine to the solution of the difficulty previously stated.

the whole; that is, we conceive the parts to exist, as we conceive their existence given through the existence of the whole containing them. If we think the whole by all the parts, we subordinate the notion of the whole to the notion of the parts; that is, we conceive the whole to exist, as we conceive its existence given through the existence of the parts which constitute it. Now, in the one case, we think the whole as conditioning or comprising the parts, in the other, the parts as conditioning or comprising the whole. In the former case, the parts are thought to exist, because their whole exists; in the latter, the whole is thought to exist, because its parts exist. In either case, the prior or determining notion is thought to comprise or to contain the posterior or determined. To apply this doctrine: On the one hand, every science is true only as all its several rules are true; in this instance the science is conceived as the determined notion, that is, as contained in the aggregate of its constituent rules. On the other hand, each rule of any science is true only as the science itself is true; in this instance the rule is conceived as the determined notion, that is, as contained in the whole science. Thus, every single syllogism obtains its logical legitimacy, because it is a consequent of the doctrine of syllogism; the latter is, therefore, the reason of each several syllogism, and the whole science of Logic is abolished, if each several syllogism, conformed to this doctrine, be not valid. On the other hand, the science of Logic, as a whole, is only necessary inasmuch as its complementary doctrines are necessary; and these are only necessary inasmuch as their individual applications are necessary; if Logic, therefore, as a whole, be not necessary, the necessity of the parts, which constitute, determine, and comprehend that whole, is subverted. In one relation, therefore, reason and consequent are as the whole and a contained part, in another, as all the parts and the constituted or comprised whole. But in both relations, the reason — the determining notion — is thought, as involving in it the existence of the consequent or determined notion. Thus, in one point of view, the genus is the determining notion, or reason, out of which are evolved, as consequents, the species and individual; in another, the individual is the determining notion or reason, out of which, as consequents, are evolved the species and genus.[1] In like manner, if we regard the subject as that in which the attributes inhere, — in this view the subject is the reason, that is, the whole, of which the attributes are a part; whereas if we regard the attributes as the modes through which alone the subject can exist, in this view the attributes are the reason, that is, the whole, of which the subject is a part. In a word, whatever we think as conditioned, we think as contained by something else, that is, either as a part, or as a constituted whole; whatever we think as conditioning, we think either as a containing whole, or as a sum of constituting parts. What, therefore, the sumption of an hypothetical syllogism denotes, is simply this: If A, a notion conceived as conditioning, and, therefore, as involving B, exist, then B also is necessarily conceived to exist, inasmuch as it is conceived as fully conditioned by, or as involved in, A. I am afraid that what I have now said may not be found to have removed the difficulty, but if it suggest to you a train of reflection which may lead you to a solution of the difficulty by your own effort, it will have done better.

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[1] This is expressly allowed by Aristotle, *Metaph.*, iv. 25, and is quoted from him by Sir W. Hamilton himself, *Discussions*, p. 173. — ED.

So much for Hypothetico-disjunctive syllogisms, the last of the four classes determined by the internal form of reasoning. In these four syllogisms, — the Categorical, the Disjunctive, the Hypothetical, and the Hypothetico-disjunctive, — all that they exhibit is conformable to the necessary laws of thought, and they are each distinguished from the other by their essential nature; for their sumptions, as judgments, present characters fundamentally different, and from the sumption, as a general rule, the validity of syllogisms primarily and principally depends.

# LECTURE XIX.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO EXTERNAL FORM.

### A. COMPLEX,—EPICHEIREMA AND SORITES.

Syllogisms,—their External Form.

In our treatment of Syllogisms, we have hitherto taken note only of the Internal, or Essential Form of Reasoning. But, besides this internal or essential form, there is another, an External or Accidental Form; and as the former was contained in the reciprocal relations of the constituent parts of the syllogism, as determined by the nature of the thinking subject itself, so the latter is contained in the outer expression or enouncement of the same parts, whereby the terms and propositions are variously affected in respect of their number, position, and order of consecution.. The varieties of Syllogism arising from their external form may, I think, be conveniently reduced to the three heads expressed in the following paragraph:

Par. LXVIII. Division of Syllogisms according to External Form.

¶ LXVIII. Syllogisms, in respect of their External Form, admit of a threefold modification. For while, as pure, they are at once *Simple*, and *Complete*, and *Regular*, so, as qualified, they are either *Complex*, or *Incomplete*, or *Irregular;* the two former of these modifications regarding the number of their parts, as apparently either too many or too few; the last regarding the inverted order in which these parts are enounced.

Explication.
A. Complex Syllogisms.

I shall consider these several divisions in their order; and, first, of the syllogisms which vary from the simple form of reasoning by their apparent complexity.

Relation of Syllogisms to each other.

But, before touching on the varieties of syllogism afforded by their apparent complexity of composition, it may be proper to premise a few words in regard to the relation of syllogisms to each other. "Every syllogism may be considered as absolute and independent, inasmuch as it always contains a complete and inclusive series of thought. But a syllogism may also stand to other syllogisms in such a relation that, along with these correlative syllogisms, it makes up a greater or lesser series of thoughts, all holding to each other the dependence of antecedent and consequent. And such a reciprocal dependence of syllogisms becomes necessary, when one or other of the predicates of the principal syllogism is destitute of complete certainty, and when this certainty must be established through one or more correlative syllogisms."[1]

Classes and designations of related syllogisms Monosyllogism.

Polysyllogism, or Chain of Reasoning.

"A syllogism, viewed as an isolated and independent whole, is called a *Monosyllogism* (*monosyllogismus*), that is, a single reasoning; whereas, a series of correlative syllogisms, following each other in the reciprocal relation of antecedent and consequent, is called a *Polysyllogism* (*polysyllogismus*), that is, a multiplex or composite reasoning, and may likewise be denominated a *Chain of Reasoning* (*series syllogistica*). Such a chain — such a series — may, however, have such an order of dependence, that either each successive syllogism is the reason of that which preceded, or the preceding syllogism is the reason of that which follows.

This Analytic and Synthetic

In the former case, we conclude analytically or regressively; in the second, synthetically or progressively.

Prosyllogism.

Episyllogism

That syllogism in the series which contains the reasoning of the premise of another, is called a *Prosyllogism* (*prosyllogismus*); and that syllogism which contains the consequent of another, is called an *Episyllogism* (*episyllogismus*). Every Chain of Reasoning must, therefore, be made up both of Prosyllogisms and of Episyllogisms."[2] "When the series is composed of more than two syllogisms, the same syllogism may, in different relations, be at once a prosyllogism and an episyllogism; and that reasoning which contains the primary or highest reason is alone exclusively a prosyllogism, as that reasoning which enounces the last or lowest consequent is alone exclusively an episyllogism. But this concatenation of syllogisms, as antecedents and consequents, may be either manifest, or occult, according as the plurality of syllogisms may either be openly displayed, or as it may appear only as a single syllogism. The polysyllogism is, therefore, likewise either manifest or occult. The occult polysyllogism, with which alone we are at present concerned, consists either of partly complete and partly abbreviated syllogisms, or of syllogisms all equally abbreviated. In the former case, there emerges the complex syllogism called *Epicheirema*; in the latter, the complex syllogism called *Sorites*."[1] Of these in their order.

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[1] Esser. *Logik*. § 104. — Ed

[2] Krug *Logik*, § 111. — Ed.

Par. LXIX. The Epicheirema.

¶ LXIX. A syllogism is now vulgarly called an *Epicheirema* (ἐπιχείρημα), when to either of the two premises, or to both, there is annexed a reason for its support. As:

B *is* A;
*But* C *is* B; *for it is* D;
*Therefore,* C *is also* A.[2]

Or,

*All vice is odious;*
*But avarice is a vice; for it makes men slaves;*
*Therefore, avarice is odious.*[3]

Explication.

In illustration of this paragraph, it is to be observed that the Epicheirema, or Reason-rendering Syllogism. is either single or double, according as one or both of the premises are furnished with an auxiliary reason. The single epicheirema is either an epicheirema of the first or second order, according as the adscititious proposition belongs to the sumption or to the subsumption. There is little or nothing requisite to be stated in regard to this variety of complex syllogism, as it is manifestly nothing more than a regular episyllogism with an abbreviated prosyllogism interwoven. There might be something said touching the name, which, among the ancient rhetoricians, was used now in a stricter, now in a looser, signification.[1] This, however, as it has little interest in a logical point of view, I shall not trouble you by detailing; and now proceed to a far more important and interesting subject, — the second variety of complex syllogisms, — the Sorites.

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[1] Esser, *Logik*, § 104. — ED. [Cf. Reusch, *Systema Logicum*, § 578, p. 664, Ienæ, 1741.]

[2] In full, —

C *is* D;
D *is* B;
*Therefore,* C *is* B.

[3] In full, —

*What makes men slaves is a vice;*
*But avarice makes men slaves;*
*Therefore, avarice is a vice.*

Par. LXX. The Sorites.

¶ LXX. When, on the common principle of all reasoning, — that the part of a part is a part of the whole, — we do not stop at the second gradation, or at the part of the highest part, and conclude that part of the whole, — as *All* B *is a part of the whole* A, *and all* C *is a part of the part* B, *therefore all* C *is also a part of the whole* A,— but proceed to some indefinitely remoter part, as D, E, F, G, H, etc., which, on the general principle, we connect in the conclusion with its remotest whole,— this complex reasoning is called a *Chain-Syllogism* or *Sorites.* If the whole from which we descend be a comprehensive quantity, the Sorites is one of Comprehension; if it be an extensive quantity, the Sorites is one of Extension. The formula of the first will be:

1) E *is* D; that is, E *comprehends* D;
2) D *is* C; that is, D *comprehends* C;
3) C *is* B; that is, C *comprehends* B;
4) B *is* A; that is, B *comprehends* A;
*Therefore,* E *is* A; in other words, E *comprehends* A.

The formula of the second will be:

1) B *is* A; that is, A *contains under it* B;
2) C *is* B; that is, B *contains under it* C;
3) D *is* C; that is, C *contains under it* D;
4) E *is* D; that is, D *contains under it* E;
*Therefore,* E *is* A; in other words, A *contains under it* E.

These reasonings are both *Progressive,* each in its several quantity, as descending from whole to part. But as we may also, arguing back from part to whole, obtain the same conclusion, there is also competent in either quantity a *Regressive Sorites.* However, the formula of the Regressive Sorites in the one quantity, will be only that of the Progressive Sorites in the other.[1]

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[1] For some notices of these variations, see Quintilian, *Inst. Orat.*, v. 10, 2, v. 14, 5. Compare also Schweighæuser on Epictetus, i. 8; Trendelenburg, *Elementa Logices Aristotelicæ*, § 33; Facciolati, *Acroases*, *De Epichiremate*, p. 127 *et seq.* In Aristotle the term is used for a dialectic syllogism. See *Topica*, viii. 11. — Ed.

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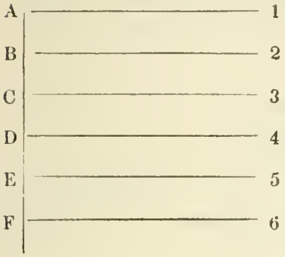

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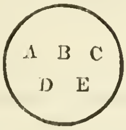

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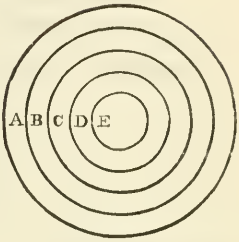

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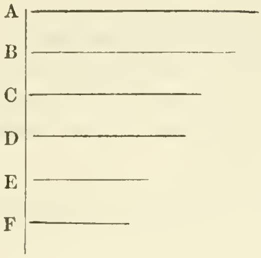

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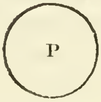

Explication.

As a concrete example of these:

I. Progressive Comprehensive Sorites.

Concrete examples of Sorites.

*Bucephalus is a horse;*
*A horse is a quadruped;*
*A quadruped is an animal;*
*An animal is a substance;*
*Therefore, Bucephalus is a substance.*

Or as explicated:

> *The representation of the individual Bucephalus comprehends or contains in it the notion horse;*

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[1] [On the Sorites in general, see Crakanthorpe, *Logica*, L. iii. c. 22, p. 219. Valla, *Dialect.*, L. iii. c. 54, fol. 38, ed. 1509. M. Duncan, *Instit. Log.* L. iv. c. vii. § 6, p. 255. Facciolati, *Acroases*, *De Sorite*, p. 15 *et seq.* Melanchthon, *Erotem. Dial.*, L. iii. *De Sorite*, p. 743. Wolf, *Phil. Rat.*, § 466, *et seq.* Walch, *Lexikon*, *v.* "Sorites." Fries, *Logik*, § 64.]

[2] Diagrams Nos. 1 and 2 represent the affirmative Sorites in the case in which the concepts are coëxtensive. — See above, p. 133, Diagram 2. Diagrams Nos. 3 and 4 represent the Affirmative Sorites in the case in which the concepts are subordinate. — See above, p. 133, Diagram 3. Diagram No. 5, taken in connection with No. 3, represents the Negative Sorites. Thus, to take the Progressive Comprehensive Sorites: — E *is* D, D *is* C, C *is* B, B *is* A, *no* A *is* P; *therefore*, *no* E *is* P. — Ed.

*The notion horse comprehends the notion quadruped;*
*The notion quadruped comprehends the notion animal;*
*The notion animal comprehends the notion substance;*
*Therefore (on the common principle that the part of a part is a part of the whole), the representation of the individual, Bucephalus, comprehends or contains in it the notion substance.*

II. Regressive Comprehensive Sorites.

*An animal is a substance;*
*A quadruped is an animal;*
*A horse is a quadruped;*
*Bucephalus is a horse;*
*Therefore, Bucephalus is a substance.*

Or as explicated:

*The notion animal comprehends the notion substance;*
*The notion quadruped comprehends the notion animal;*
*The notion horse comprehends the notion quadruped;*
*The representation, Bucephalus, comprehends the notion horse;*
*Therefore (on the common principle, etc.), the representation, Bucephalus, comprehends the notion substance.*

III. Progressive Extensive Sorites (which is, as enounced by the common copula, identical in expression with the Regressive Comprehensive Sorites, No. II.):

*An animal is a substance;*
*A quadruped is an animal;*
*A horse is a quadruped;*
*Bucephalus is a horse;*
*Therefore, Bucephalus is a substance.*

Or as explicated:

*The notion animal is contained under the notion substance;*
*The notion quadruped is contained under the notion animal;*
*The notion horse is contained under the notion quadruped;*
*The representation Bucephalus is contained under the notion horse;*
*Therefore (on the common principle, etc.), the representation Bucephalus is contained under the notion substance.*

IV. The Regressive Extensive Sorites (which is, as expressed by the ambiguous copula, verbally identical with the Progressive Comprehensive Sorites, No. I.):

*Bucephalus is a horse;*
*A horse is a quadruped;*
*A quadruped is an animal;*
*An animal is a substance;*
*Therefore, Bucephalus is a substance.*

Or as explicated :

*The representation Bucephalus is contained under the notion horse;*
*The notion horse is contained under the notion quadruped;*
*The notion quadruped is contained under the notion animal;*
*The notion animal is contained under the notion substance;*
*Therefore, the representation Bucephalus is contained under the notion substance.*

1. The formal inference in Sorites equally necessary as in simple syllogism.

There is thus not the smallest difficulty either in regard to the peculiar nature of the Sorites, or in regard to its relation to the simple syllogism. In the first place, it is evident that the formal inference in the Sorites is equally necessary and equally manifest as in the simple syllogism, for the principle — the part of a part is a part of the whole — is plainly not less applicable to the remotest than to the most proximate link in the subordination of whole and part. In the second place, it is evident that the Sorites can be resolved into as many simple syllogisms as there are middle terms between the subject and predicate of the conclusion, that is, intermediate wholes and parts between the greatest whole and the smallest part, which the reasoning connects. Thus, the concrete example of a Sorites, already given, is virtually composed of three simple syllogisms. It will be enough to show this in one of the quantities; and, as the most perspicuous, let us take that of Comprehension.

2. Sorites resolvable into simple syllogisms.

This illustrated.

The Progressive Sorites in this quantity was as follows (and it is needless, I presume, to explicate it) :

*Bucephalus is a horse;*
*A horse is a quadruped;*
*A quadruped is an animal;*
*An animal is a substance;*
*Therefore, Bucephalus is a substance.*

Here, besides the major and minor terms (*Bucephalus* and *substance*), we have three middle terms — *horse*, — *quadruped*, — *animal*. We shall, consequently, have three simple syllogisms. Thus, in the first place, we obtain from the middle term *horse*, the following syllogism, concluding *quadruped* of *Bucephalus :*

I. — *Bucephalus is a horse;*
*But a horse is a quadruped;*
*Therefore, Bucephalus is a quadruped.*

Having thus established that *Bucephalus is a quadruped*, we employ *quadruped* as a middle term by which to connect *Bucephalus* with *animal*. We therefore make the conclusion of the previous syllogism (No. I.) the sumption of the following syllogism (No. II.):

II. — *Bucephalus is a quadruped;*
*But a quadruped is an animal;*
*Therefore, Bucephalus is an animal.*

Having obtained another step, we in like manner make *animal*, which was the minor term in the preceding syllogism, the middle term of the following; and the conclusion of No. II. forms the major premise of No. III.

III. — *Bucephalus is an animal;*
*But an animal is a substance;*
*Therefore, Bucephalus is a substance.*

In this last syllogism, we reach a conclusion identical with that of the Sorites.

3. Sorites equally natural as simple syllogism.

In the third place, it is evident that the Sorites is equally natural as the simple syllogism; and, as the relation is equally cogent and equally manifest between a whole and a remote, and a whole and a proximate, part, that it is far less prolix, and, consequently, far more convenient. What is omitted in a Sorites is only the idle repetition of the same self-evident principle, and as this can without danger or inconvenience be adjourned until the end of a series of notions in the dependence of mutual subordination, it is plain that, in reference to such a series, a single Sorites is as much preferable to a number of simple syllogisms, as a comprehensive cipher is preferable to the articulate enumeration of the units which it collectively represents.

Before proceeding to touch on the logical history of this form of syllogism, and to comment on the doctrine in regard to it maintained by all logicians, I shall conclude what it is proper further to state concerning its general character.

Par. LXXI. Sorites, — Categorical and Hypothetical.

¶ LXXI. A Sorites may be either Categorical or Hypothetical; and, in both forms, it is governed by the following laws: — Speaking of the Common or Progressive Sorites (in which reasoning you will observe the meaning of the word *progressive* is reversed), which proceeds from the individual to the general, and to which the other form may be easily reduced: — 1°. The number of the premises is unlimited. 2°. All the premises, with exception of the last, must be affirmative, and, with exception of the first, definite. 3°. The first premise may be either definite or indefinite. 4°. The last may be either negative or affirmative.

Explication. Formula of Hypothetical Sorites.

I have already given you examples of the categorical Sorites. The following is the formula of the hypothetical:

| PROGRESSIVE. | REGRESSIVE. |
|---|---|
| *If* D *is*, C *is;* | *If* B *is*, A *is;* |
| *If* C *is*, B *is;* | *If* C *is*, B *is;* |
| *If* B *is*, A *is;* | *If* D *is*, C *is;* |
| (In modo ponente), | (In modo ponente), |
| *Now* D *is;* | *Now D is;* |
| *Therefore*, A *is also.* | *Therefore*, A *is.* |
| (Or in modo tollente), | (Or in modo tollente), |
| *Now* A *is not;* | *Now* A *is not;* |
| *Therefore*, D *is not.* | *Therefore*, D *is not.* |

Or, to take a concrete example:

PROGRESSIVE.

*If Harpagon be avaricious, he is intent on gain;*
*If intent on gain, he is discontented;*
*If discontented, he is unhappy;*
*Now Harpagon is avaricious;*
*He is, therefore, unhappy.*

REGRESSIVE.

*If Harpagon be discontented, he is unhappy;*
*If intent on gain, he is discontented;*
*If avaricious, he is intent on gain;*
*Now Harpagon is avaricious;*
*Therefore, he is unhappy.*

Resolution of Hypothetical Sorites into simple syllogisms. I. Progressive Sorites.

In regard to the resolution of the Hypothetical Sorites into simple syllogisms, it is evident that in this Progressive Sorites we must take the two first propositions as premises, and then in the conclusion connect the antecedent of the former proposition with the consequent of the latter. Thus:

I. — *If Harpagon be avaricious, he is intent on gain.*
*If intent on gain, he is discontented ;*
*Therefore, if Harpagon be avaricious, he is discontented.*

We now establish this conclusion, as the sumption of the following syllogism :

II. — *If Harpagon be avaricious, he is discontented ;*
*If discontented, he is unhappy ;*
*Therefore, if Harpagon be avaricious, he is unhappy.*

In like manner we go to the next syllogism :

III. — *If Harpagon be avaricious, he is unhappy ;*
*Now Harpagon is avaricious ;*
*Therefore, he is unhappy.*

II Regressive Sorites.

In the Regressive Sorites, we proceed in the same fashion ; only that, as here the consequent of the second proposition is the antecedent of the first, we reverse the consecution of these premises. Thus :

I. — *If Harpagon be intent on gain, he is discontented ;*
*If discontented, he is unhappy ;*
*Therefore, if Harpagon be intent on gain, he is unhappy.*

We then take the third proposition for the sumption of the next, — the second syllogism, and the conclusion of the preceding for its subsumption :

II. — *If Harpagon be avaricious, he is intent on gain ;*
*If intent on gain, he is unhappy ;*
*Therefore, if Harpagon be avaricious, he is unhappy.*

We now take this last conclusion for the sumption of the last syllogism :

III. — *If Harpagon be avaricious, he is unhappy ;*
*Now Harpagon is avaricious ;*
*Therefore, he is unhappy.*

Disjunctive Sorites.

But it may be asked, can there be no Disjunctive Sorites ? To this it may be answered, that in the sense in which a categorical and hypothetical syllogism is possible, — viz., so that a term of the preceding proposition should be the subject or predicate of the following, — in this sense, a disjunctive sorites is impossible: since two opposing notions, whether as contraries or contradictories, exclude each other, and cannot, therefore, be combined as subject and predicate. But when the object has been determined by two opposite characters, the disjunct members may be amplified at pleasure, and there follows certainly a correct conclusion, provided that the disjunction be logically accurate. As:

A *is either* B *or* C.

Now,

| | |
|---|---|
| B *is either* D *or* E; | C *is either* F *or* G; |
| D *is either* H *or* I; | F *is either* M *or* N; |
| E *is either* K *or* L. | G *is either* O *or* P. |

*Therefore,* A *is either* H, *or* I, *or* K, *or* L, *or* M, *or* N, *or* O, *or* P.

Complex and unserviceable.

Although, therefore, it be true that such a Sorites is correct; still, were we astricted to such a mode of reasoning, thought would be so difficult, as to be almost impossible. But we never are obliged to employ such a reasoning; for when we are once assured that A *is either* B *or* C,—and assured we are of this by one of the fundamental laws of thought,—we have next to consider whether A is B or C, and if A is B, then all that can be said of C, and if A is C, then all that can be said of B, is dismissed as wholly irrelevant. In like manner, in the case of B, it must be determined whether it is D or E, and in the case of C, whether it is F or G; and this being determined, one of the two members is necessarily thrown out of account. And this compendious method we follow in the process of thought spontaneously, and as if by a natural impulsion.

So much for the logical character of the Sorites. It now remains to make some observations, partly historical, partly critical, in connection with this subject.

Historical notice of the logical doctrine of Sorites.

Neither name nor doctrine found in Aristotle.

In regard to the history of the logical doctrine of this form of reasoning, it seems taken for granted, in all the systems of the science, that both the name *Sorites*, as applied to a chain-syllogism, and the analysis of the nature of that syllogism, are part and parcel of the logical inheritance bequeathed to us by Aristotle. Nothing can, however, be more erroneous. The name Sorites does not occur in any logical treatise of Aristotle; nor, as far as I have been able to discover, is there, except in one vague and cursory allusion, any reference to what the name is now employed to express.[1] Nay, further, the word *Sorites* is never, I make bold to say, applied by any ancient writer to designate a certain form of reasoning. On the contrary, Sorites, though a word in not unfrequent employment by ancient authors, nowhere occurs in any other logical meaning than that of a particular kind of sophism, of which the Stoic Chrysippus was reputed the inventor.[2] Σωρός, you know, in Greek, means *a heap* or *pile* of any aggregated substances, as sand, wheat, etc.; and *Sorites*, literally *a heaper*, was a name given to a certain captious argument, which obtained in Latin from Cicero the denomination of *acervalis*.[3] The nature of the argument was this: You were asked, for example, whether a certain quantity of something of variable amount were large or small, — say a certain sum of money. If you said it was small, the adversary went on gradually adding to it, asking you at each increment whether it were still small; till at length you said that it was large. The last sum which you had asserted to be small, was now compared with that which you now asserted to be large, and you were at length forced to acknowledge that one sum which you maintained to be large, and another which you maintained to be small, differed from each other by the very pettiest coin, — or, if the subject were a pile of wheat, by a single corn. This sophism, as applied by Eubulides (who is even stated by Laertius[4] to be the inventor of the Sorites in general), took the name of φαλακρὸς, *calvus*, *the bald*. It was asked, — was a man bald who had so many thousand hairs; you answer, No: the antagonist goes on diminishing and diminishing the number, till either you admit that he who was not bald with a certain number of hairs, becomes bald when that complement is diminished by a single hair; or you go on denying him to be bald, until his head be hypothetically denuded. Such was the quibble which obtained the name of *Sorites*, — *acervalis*, *climax*, *gradatio*, etc. This, it is evident, had no real analogy with the form of reasoning now known in logic under the name of *Sorites*.

Sorites, with ancient authors, used to designate a particular kind of sophism

The nature of this sophism.

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[1] The passage referred to is probably *Anal. Prior.*, I. 25. But there was no need of a special treatment of the Sorites, as it is merely a combination of ordinary syllogisms, and subject to the same rules. — Ed. [The principle of the Sorites is to be found in Aristotle's rule, *Categ.*, c 2 "Prædicatum prædicati est prædicatum subjecti." See also, *Anal. Post.*, I. 22 *et seq.* Cf. Pacius, *Comment.*, p 159. Bertius, *Logica Peripatetica*, L iii Appendix, p. 179.]

[2] Persius, *Sat.* vi. 80.

"Inventus, Chrysippe, tui finitor acervi." — Ed.

[Cicero applies *Sorites* to an argument which we would call a *Sorites*, but it could also be a Chrysippean. *De Finibus*, L. iv. c. 18.]

[3] *De Divinatione*, ii. 4. "Quemadmodum Soriti resistas? quem, si necesse sit, Latino verbo liceat *acervalem* appellare." Cf. Facciolati, *Acroasis*, ii. p. 17 *et seq.* — Ed.

[4] L. ii. § 108. — Ed

Laurentius Valla the first to use Sorites in its present acceptation

But when was the name perverted to this, its secondary signification? Of this I am confident, that the change was not older than the fifteenth century. It occurs in none of the logicians previous to that period. It is to be found in none of the Greek logicians of the Lower Empire; nor is it to be met with in any of the more celebrated treatises on Logic by the previous Latin schoolmen. The earliest author to whose writings I have been able to trace it, is the celebrated Laurentius Valla, whose work on *Dialectic* was published after the middle of the fifteenth century. He calls the chain-syllogism — "coacervatio syllogismorum (quem Graeci σωρὸν vocant")[1] I may notice that in the *Dialectica* of his contemporary and rival, George of Trebisond, the process itself is described, but, what is remarkable, no appropriate name is given to it.[2] In the systems of Logic after the commencement of the sixteenth century, not only is the form of reasoning itself described, but described under the name it now bears.

The doctrine of logicians regarding the Sorites illustrates their one-sided view of the nature of reasoning in general.

I have been thus particular in regard to the history of the Sorites, — word and thing, — not certainly on account of the importance of this history, considered in itself, but because it will enable you the better to apprehend what is now to be said of the illustration which the doctrine, taught by logicians themselves of the nature of this particular process, affords of the one-sided view which they have all taken of the nature of reasoning in general.

I have already shown, in regard to the simple syllogism, that all deductive reasoning is from whole to part; that there are two kinds of logical whole and two kinds of logical part, — the one in the quantity of comprehension, the other in the quantity of extension; — and that there are consequently two kinds of reasoning corresponding to these several quantities. I further showed that logicians had in simple syllogisms marvellously overlooked one, and that the simplest and most natural, of these descriptions of reasoning, — the reasoning in the quantity of comprehension; and that all their rules were exclusively relative to the reasoning which proceeds in the quantity of extension. Now, in to-day's Lecture, I have shown that, as in simple syllogisms, so in the complex form of the Sorites, there is equally competent a reasoning in comprehension and in extension, — though undoubtedly, in the one case as in the other, the reasoning in comprehension is more natural and easy in its evolution than the reasoning in extension, inasmuch as the middle term, in the former, is really intermediate in position, standing between the major and the minor terms, whereas, in the latter, the middle term is not in situation middle, but occupies the position of one or other of the extremes.

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[1] *Dialecticæ Disputationes*, Lib. iii. c. 12. See *Laurentii Vallæ Opera*, Basileæ, 1540, p. 742. — Ed.

[2] See *Georgii Trapezuntii De Re Dialectica Libellus*, Coloniæ, 1533, f. 60$^a$. Cf. the Scholia of Neomagus, *ibid.* f. 67$^b$. — Ed.

Logicians have overlooked the Sorites of Extension.

Now, if in the case of simple syllogisms, it be marvellous that logicians should have altogether overlooked the possibility of a reasoning in comprehension, it is doubly marvellous that, with this their prepossession, they should, in the case of the Sorites, have altogether overlooked the possibility of a reasoning in extension. But so it is.[1] They have all followed each other in defining the Sorites as a concatenated syllogism in which the predicate of the proposition preceding is made the subject of the proposition following, until we arrive at the concluding proposition, in which the predicate of the last of the premises is enounced of the subject of the first. This definition applies only to the Progressive Sorites in comprehension, and to the Regressive Sorites in extension: but that they did not contemplate the latter form at all is certain, both because it is not lightly to be presumed that they had in view that artificial and recondite form, and because the examples and illustrations they supply positively prove that they had not.

Difference between the two forms of Sorites.

To the Progressive Sorites in extension, and to the Regressive Sorites in comprehension, this definition is inapplicable; for in these, the subject of the premise preceding is not the predicate of the premise following. But the difference between the two forms is better stated thus: — In the Progressive Sorites of comprehension and the Regressive Sorites of extension, the middle terms are the predicates of the prior premises, and the subjects of the posterior; the middle term is here in position intermediate between the extremes. On the contrary, in the Progressive Sorites of extension and in the Regressive Sorites of comprehension, the middle terms are the subjects of the prior premises and the predicates of the posterior; the middle term is here in position not intermediate between the extremes.

To the question, — why, in the case of simple syllogisms, the logicians overlooked the reasoning in comprehension, and, in the case of the Sorites, the reasoning in extension, it is, perhaps, impossible to afford a satisfactory explanation. But we may plausibly conjecture, what it is out of our power certainly to prove. In regard to simple syllogisms, it was an original dogma of the Platonic school, and an early dogma of the Peripatetic, that philosophy — that science, strictly so called — was only conversant with, and was exclusively contained in, universals; and the doctrine of Aristotle, which taught that all our general knowledge is only an induction from an observation of particulars, was too easily forgotten or perverted by his followers. It thus obtained almost the force of an acknowledged principle, that everything to be known must be known under some general form or notion. Hence the exaggerated importance attributed to definition and deduction; it not being considered, that we only take out of a general notion what we had previously placed therein; and that the amplification of our knowledge is not to be sought for from above, but from below, — not from speculation about abstract generalities, but from the observation of concrete particulars. But, however erroneous and irrational, the persuasion had its day and influence; and it perhaps determined, as one of its effects, the total neglect of one-half, and that not the least important half, of the reasoning process. For, while men thought only of looking upwards to the more extensive notions, as the only objects and the only media of science, they took little heed of the more comprehensive notions, and absolutely contemned individuals, as objects which could neither be scientifically known in themselves, nor supply the conditions of scientifically knowing aught besides. The logic of comprehension and of induction was, therefore, neglected or ignored, — the logic of extension and deduction exclusively cultivated, as alone affording the rules by which we might evolve higher notions into their subordinate concepts. This may help to explain why, subsequently to Aristotle, Logic was cultivated in so partial a manner; but why, subsequently to Bacon, the logic of comprehension should still have escaped observation and study, I am altogether at a loss to imagine. But to the question, — why, when reasoning in general was viewed only as in the quantity of extension, the minor form of the Sorites should have been viewed as exclusively in that of comprehension, may, perhaps, be explained by the following consideration: this form was not originally analyzed and expounded by the acuteness of Aristotle. But it could not escape notice that there was a form

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[1] [Rüdiger notices the error of those who make Sorites only of comprehensive whole. See his *De Sensu Veri et Falsi*, L. ii. c. 10, § 5, p. 400. Cf. p. 343 n., § 6.] ["Errant vulgo Peripatetici, et cum his Gassendus, qui Soritem solum ad prædicatum pertinere existimat." — ED.]

Probable reason why logicians overlooked, in the case of simple syllogisms, the reasoning in Comprehension.

And why, in the case of the Sorites, they overlooked the reasoning in Extension.

of reasoning, of very frequent employment, both by philosophers and rhetoricians, in which a single conclusion was drawn from a multiplicity of premises, and in which the predicate of the foregoing premise was usually the subject of the following. Cicero, for example, and Seneca, are full of such arguments; and the natural and easy evolution of the reasoning is indeed peculiarly appropriate to demonstration. Thus, to prove that every body is movable, we have the following self-evident deduction. Every body is in space; what is in space is in some one part of space; what is in one part of space may be in another; what may be in another part of space may change its space; what may change its space is movable; therefore, every body is movable. When, therefore, Valla, or whoever else has the honor of first introducing the consideration of this form of reasoning into Logic, was struck with the cogency and clearness of this compendious argumentation, he did not attempt to reduce it to the conditions of the extensive syllogism; and subsequent logicians, when the form was once introduced and recognized in their science, were, as usual, content to copy one from another, without subjecting their borrowed materials to any original or rigorous criticism.

> Ut nemo in sese tentat descendere; — nemo!
> Sed præcedenti spectatur mantica tergo.[1]

Accordingly, not one of them has noticed, that the Sorites of their systems proceeds in a different quantity from that of their syllogisms in general, — that their logic is thus at variance with itself; far less did any of them observe that this, and all other forms of reasoning, are capable of being drawn in another quantity from that which they all exclusively contemplated. And yet, had they applied their observation without prepossession to the matter, they would easily have seen that the Sorites could be cast in the quantity of extension, equally as common syllogisms, and that common syllogisms could be cast in the quantity of comprehension, equally as the Sorites. I have already shown that the same Sorites may be drawn either in comprehension or in extension; and in both quantities proceed either by progression or by regression. But the example given may, perhaps, be viewed as selected. Let us, therefore, take any other; and the first that occurs to my recollection is the following from Seneca,[2] which I shall translate:

Example of the Sorites in Comprehension and Extension.

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[1] Persius, iv 23. – Ed

[2] *Epist.*, 85. — Ed.

*He who is prudent is temperate;*
*He who is temperate is constant;*
*He who is constant is unperturbed;*
*He who is unperturbed is without sorrow;*
*He who is without sorrow is happy;*
*Therefore, the prudent man is happy.*

In this Sorites, everything slides easily and smoothly from the whole to the parts of comprehension. But, though the process will be rather more by hitches, the descent under extension will, if not quite so pleasant, be equally rapid and certain.

*He who is without sorrow is happy;*
*He who is unperturbed is without sorrow;*
*He who is constant is unperturbed;*
*He who is temperate is constant;*
*He who is prudent is temperate;*
*Therefore, the prudent man is happy.*

I do not think it necessary to explicate these two reasonings, which you are fully competent, I am sure, to do without difficulty for yourselves.

The Goclenian Sorites.

What renders it still more wonderful that the logicians did not evolve the competency of this process in either quantity, and thus obtain a key to the opening up of the whole mystery of syllogistic reasoning, is this: — that it is now above two centuries since the Inverse or Regressive Sorites in comprehension was discovered and signalized by Rodolphus Goclenius, a celebrated philosopher of Marburg, in which university he occupied the chair of Logic and Metaphysics.[1] This Sorites has from him obtained the name of *Goclenian;* while the progressive Sorites has been called the common or Aristotelian. This latter denomination is, as I have previously noticed, an error; for Aristotle, though certainly not ignorant of the process of reasoning now called *Sorites*, does not enter upon its consideration, either under one form or another. This observation by Goclenius, of which none of our British logicians seem aware, was a step towards the explication of the whole process; and we are, therefore, left still more to marvel how this explication, so easy and manifest, should not have been made. Before terminating this subject, I may mention that this form of syllogism has been sometimes styled by logicians not only *Sorites*, but also *coacervatio, con-*

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[1] *Goclenii Isagoge in Organum Aristotelis*, Francof., 1598, p. 255 — Ed. [For the Goclenian Sorites before Goclenius, see Pacius, *Comment. in Anal. Prior.*, i. 25. p. 159.]

*geries*, *gradatio*, *climax*, and *de primo ad ultimum*. The old name, before Valla, which the process obtained among the Greek logicians of the Lower Empire, was the vague and general appellation of *complex syllogism*, — συλλογισμὸς συνθετός.[1]

Epicheirema and Sorites, as polysyllogisms, comparatively simple, and not pleonastic.

So much for the two forms of reasoning which may be regarded as composite or complex, and which logicians have generally considered as redundant. But here it is proper to remark, that if in one point, that is, as individual syllogisms, the Epicheirema and Sorites may be viewed as comparatively complex, in another, that is, as polysyllogisms, they may be viewed as comparatively simple. For, resolve a Sorites into the various syllogisms afforded by its middle terms, and compare the multitude of propositions through which the conclusion is thus tediously evolved, with the short and rapid process of the chain-syllogism itself, and, instead of complexity, we should rather be disposed to predicate of it extreme simplicity.[2] In point of fact, we might arrange the Epicheirema and Sorites with far greater propriety under elliptical syllogisms, than, as is commonly done by logicians, under the pleonastic. This last classification is, indeed, altogether erroneous, for it is a great mistake to suppose that in either of these forms there is aught redundant.

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[1] [Blemmidas, *Epitome Logica*, c. 31.]

[2] [See Leibnitz, *Nouveaux Essais*, L. iv. c xvii. § 4, pp. 445, 446, 448, ed. Raspe.]

# LECTURE XX.

## STOICHEIOLOGY.

### SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO EXTERNAL FORM.

### B. DEFECTIVE,—ENTHYMEME.

### C. REGULAR AND IRREGULAR,—FIGURE AND MOOD.

B. Syllogisms defective in External Form.

I PROCEED now to the Second Class of Syllogisms,—those, to wit, whose External Form is defective. This class I give in conformity to the doctrine of modern logicians, whose unanimous opinion on the subject I shall comprehend in the following paragraph.

Par. LXXII. The Enthymeme.

> ¶ LXXII. According to logicians, in general, a defective syllogism is a reasoning in which one only of the premises is actually enounced. It is, therefore, they say, called an *Enthymeme* (ἐνθύμημα), because there is, as it were, something held back in the mind (ἐν θυμῷ). But, as it is possible to retain either the sumption or the subsumption, the Enthymeme is thus of two kinds:—an Enthymeme of the First, and an Enthymeme of the Second, Order. The whole distinction is, however, erroneous in principle, and, even if not erroneous, it is incomplete: for a Third Order of Enthymemes is competent by the suppression of the conclusion.

Such, as it is stated in the former part of the paragraph, is the doctrine you will find maintained, with singular unanimity, by modern logicians; and, with hardly an exception, this classification of syllogisms is stated not only without a suspicion of its own correctness, but as a division established on the authority of the great father of logic himself. In both assertions they are, however, wrong, for the classification itself is futile, and Aristotle affords it no countenance; while, at the same time, if a distinction of syllogisms is to be taken from the ellipsis of their propositions, the subdivision of enthymemes is not complete, inasmuch as a syllogism may exist with both premises expressed, and the conclusion understood.

Explication. The common doctrine of the Enthymeme futile, and erroneously attributed to Aristotle.

I shall, therefore, in the first place, show that the Enthymeme, as a syllogism of a defective enouncement, constitutes no special form of reasoning; in the second, that Aristotle does not consider a syllogism of such a character as such a special form; and, in the third, that, admitting the validity of the distinction, the restriction of the Enthymeme to a syllogism of one suppressed premise cannot be competently maintained.

1 The Enthymeme not a special form of reasoning.

[1]I. In regard, then, to the validity of the distinction. This is disproved on the following grounds: First of all, the discrimination of the Enthymeme, as a syllogism of one suppressed premise, from the ordinary syllogism, would involve a discrimination of the reasoning of Logic from the reasoning in common use; for, in general reasoning, we rarely express all the propositions of a syllogism, and it is almost only in the treatises on Abstract Logic that we find examples of reasoning in which all the members are explicitly enounced. But Logic does not create new forms of syllogism, it merely expounds those which are already given; and while it shows that in all reasoning there are, in the mental process, necessarily three judgments, the mere non-expression of any of these in language, no more constitutes in Logic a particular kind of syllogism, than does the ellipsis of a term constitute in Grammar a particular kind of concord or government. But, secondly, Syllogism and Enthymeme are not distinguished as respectively an intralogical and an extralogical form; both are supposed equally logical. Those who defend the distinction are, therefore, necessarily compelled to maintain, that Logic regards the accident of the external expression, and not the essence of the internal thought, in holding that the Enthymeme is really a defective reasoning.[2]

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[1] Compare *Discussions*, p. 153 *et seq.* — ED.

[2] [That Syllogism and Enthymeme are not properly distinct species of reasoning, see Derodon, *Logica Restituta*, Pars V. tract. i. c 1., p. 602.]

It thus appears, that to constitute the Enthymeme as a species of reasoning distinct from Syllogisms Proper, by the difference of perfect and imperfect, is of all absurdities the greatest. But is this absurdity the work of Aristotle? — and this leads us to the second head.

II. The distinction of the Enthymeme as a special form of reasoning not made by Aristotle.

The Enthymeme of Aristotle, — what.

II. Without entering upon a regular examination of the various passages of the Aristotelic treatises relative to this point, I may observe, in the first place, that Aristotle expressly declares in general, that a syllogism is considered by the logician, not in relation to its expression (οὐ πρὸς τὸν ἔξω λόγον), but exclusively as a mental process (ἀλλὰ πρὸς τὸν ἐν τῇ ψυχῇ λόγον).[1] The distinction, therefore, of a class of syllogisms, as founded on a verbal accident, he thus of course, implicitly and by anticipation, condemns. But Aristotle, in the second place, does distinguish the Enthymeme as a certain kind of syllogism, — as a syllogism of a peculiar matter, — as a syllogism from signs and likelihoods.[2] Now if, having done this, it were held that Aristotle over and above distinguished the Enthymeme also as a syllogism with one suppressed premise, Aristotle must be supposed to define the Enthymeme by two differences, and by two differences which have no mutual analogy; for a syllogism from signs and likelihoods does not more naturally fall into an elliptical form than a syllogism of any other matter. Yet this absurdity has been and is almost universally believed of the acutest of human intellects, and on grounds which, when examined, afford not the slightest warrant for such a conclusion. On the criticism of these grounds it would be out of place here to enter. Suffice it to say, that the texts in the *Organon* and *Rhetoric*, which may be adduced in support of the vulgar opinion, will bear no such interpretation; — that in one passage, where the word ἀτελὴς (*imperfect*) is applied to the Enthymeme, — this word, if genuine, need signify only that the reasoning from signs and probabilities affords not a perfect or necessary inference; but that, in point of fact, the word ἀτελὴς is there a manifest interpolation, made to accommodate the Aristotelic to the common doctrine of the Enthymeme, for it is not extant in the oldest manuscripts, and has, accordingly, without any reference to the present question, been ejected from the best recensions, and, among others, from the recent edition of the works of Aristotle by the Academicians of Berlin, — an edition founded on a collation of the principal manuscripts throughout Europe.[1] It is not, however, to be denied that the term *Enthymeme* was applied to a syllogism of some unexpressed part, in very ancient times; but, along with this meaning, it was also employed by the Greek and Roman rhetoricians for a thought in general, as by Dionysius the Halicarnassian,[2] and the author of the *Rhetoric to Alexander*, attributed to Aristotle,[3]— for an *acute dictum*, as by Sopater[4] and Aulus Gellius,[5]— for a reasoning from contraries or contradictories, as by Cicero.[6] Quintilian gives three meanings of the term; in one sense, signifying "*omnia mente concepta*," in another, "*sententia cum ratione*," in a third, "*argumenti conclusio, vel ex consequentibus, vel ex repugnantibus*."[7]

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[1] *Anal. Post.*, i. 10. — Ed.

[2] *Anal. Prior.*, ii. 27. *Rhet.*, i. 2 — Ed.

Applications of the term *Enthymeme*.

By Dionysius of Halicarnassus Author of *Rhetoric to Alexander* Sopater. Aulus Gellius Cicero. Quintilian.

Denoted, with some of the ancients, a syllogism with some suppressed part. The Aphrodisian. Ammonius. Philoponus. Pachymeres. Quintilian. Ulpian. Scholiast on Hermogenes.

Among the ancients, who employed the term for a syllogism with some suppressed part, a considerable number held, with our modern logicians, that it was a syllogism deficient of one or other premise, as Alexander the Aphrodisian, Ammonius Hermiæ, Philoponus,[8] etc. Some, however, as Pachymeres,[9] only recognized the absence of the major premise. Some, on the contrary, thought, like Quintilian,[10] that the suppressed proposition ought to be the conclusion; — nay, Ulpian, the Greek commentator of Demosthenes, and the scholiast on Hermogenes the Rhetorician,[1] absolutely define an Enthymeme — "a syllogism, in which the conclusion is unexpressed."[2]

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[1] For a fuller history of this interpolation, see *Discussions*, p. 154. — Ed. [For the correct doctrine of the Aristotelic Enthymeme, see Mariotte, *Essay de Logique*, P. ii. disc. iii. p 163. Paris, 1678. — Ed.]

[2] *Epistola ad Cn Pompeium de præcipuis Historicis*. c. 5 Τῆς μέντοι καλλιλογίας ἐκείνου καὶ τοῦ πλούτου τῶν ἐνθυμεμάτων κατὰ πολὺ ὑστερεῖ. The expression πλοῦτος ἐνθυμεμάτων is rendered by J. C. T. Ernesti, *Gedanken Fulle*: see his *Lexikon Technologiæ Græcorum Rhetoricæ*, v. ἐνθύμεμα. The same sentence is repeated in nearly the same words by Dionysius, in his *Veterum Scriptorum Censura*, iii 2. — Ed.

[3] The author of the *Rhetorica ad Alexandrum*, c. 8, classes the enthymeme among proofs (πίστεις), and in c 11, defines it as a proof, drawn from any kind of opposition. Ἐνθυμήματα δ' ἐστὶν οὐ μόνον τὰ τῷ λόγῳ καὶ τῇ πράξει ἐναντιούμενα, ἀλλὰ καὶ τοῖς ἄλλοις ἅπασιν. This work is attributed by Victorius to Anaximenes of Lampsacus, and this conjecture is adopted by the latest editor, Spengel — Ed.

[4] *Sopatri Apameensis Prolegomena in Aristidem Aristidis Op. Omn.*, ed. Jebb, vol. i. f. d 3. Καὶ τῇ τῶν ἐνθυμημάτων τυκνότητι δημοσθενίζει. In Canter's *Prolegomena* this expression is rendered *sententiarum densitas*, and the word ἐνθυμηματικός in the same passage by *argutus in argumentis*. But compare *Discussions*, p. 157 — Ed.

[5] *Noctes Atticæ*, vi. 13. "Quærebantur autem non gravia nec reverenda, sed ἐνθυμήματα quædam lepida et minuta." — Ed.

[6] *Topica*, c. 13. — Ed.

[7] *Inst. Orat.*, v. 10, 1. — Ed.

[8] See Alexander, *In Topica*, pp 6, 7, ed. Ald. 1513. Ammonius, *In Quinque Voces Porphyrii*, f. 5 a, ed. Ald. 1546 Philoponus, *In Anal. Post.*, f. 4 a, ed. Ald. 1534. These authorities are cited in the author's note, *Discussions*, p. 156. — Ed

[9] *Epitome Logices Aristotelis*, Oxon., 1666, p. 13 See also his *Epitome in Universam Aristotelis Disserendi Artem*, appended to Rasarius's translation of Ammonius on Porphyry Lugd., 1547, p. 244. — Ed.

[10] *Inst. Orat.*, v. 14, 1. — Ed.

III. Admitting the validity of the discrimination of the Enthymeme, it cannot be restricted to a syllogism of one suppressed premise.

III. This leads us to the third head; for on no principle can it be shown, that our modern logicians are correct in denying or not contemplating the possibility of the reticence of the conclusion. The only principle on which a syllogism is competent, with one or other of its propositions unexpressed, is this, — that the part suppressed is too manifest to require enouncement. On this principle, a syllogism is not less possible with the conclusion, than with either of the premises, understood; and, in point of fact, occurs quite as frequently as any other. The logicians, therefore, to complete their doctrine, ought to have subdivided the Enthymeme not merely into Enthymemes of the first and second, but also into Enthymemes of the third order, according as the sumption, the subsumption, or the conclusion is suppressed.[3] As examples of these various Enthymemes, the following may suffice:

Examples of Enthymemes of the First, Second, and Third, Order.

THE EXPLICIT SYLLOGISM.

*Every liar is a coward;*
*Caius is a liar;*
*Therefore, Caius is a coward.*

I. ENTHYMEME OF THE FIRST ORDER — (the Sumption understood.)

*Caius is a liar;*
*Therefore, Caius is a coward.*

II. ENTHYMEME OF THE SECOND ORDER — (the Subsumption understood.)

*Every liar is a coward;*
*Therefore, Caius is a coward.*

III. ENTHYMEME OF THE THIRD ORDER — (the Conclusion understood.)

*Every liar is a coward;*
*And Caius is a liar.*

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[1] Ulpian, *Ad Demosth. Olynth.*, ii. f. 7 b, ed. Ald., 1527. Anonymi ad Hermogenem. *De Inventione*, lib. iv. See *Rhetores Græci*, ed. Ald. 1509, vol. ii. p. 371. In the same work, p. 365, the scholiast allows that either premise or conclusion may be omitted. — Ed.

[2] An enlarged and corrected list of authorities on this question is given by the author, *Discussions*, p. 157. — Ed.

[3] [That the Enthymeme is of three orders is held by Victorinus (in Cassiodorus *Opera*, vol ii. p. 536, ed. 1729. *Rhetores Pithœi*, p. 341, ed. 1599). or rather of four orders, for there may be an Enthymeme with only one proposition enounced. See Victorinus, as above.]

Epigrammatic examples of Enthymeme with suppressed conclusion.

In this last, you see, the suppression of the conclusion is not only not violent, but its expression is even more superfluous than that of either of the premises. There occurs to me a clever epigram of the Greek Anthology, in which there is a syllogism with the conclusion suppressed. I shall not quote the original, but give you a Latin and English imitation, which will serve equally well to illustrate the point in question.[1] The Latin imitation is by the learned printer Henricus Stephanus, and he applies his epigram to a certain Petrus, who, I make no doubt, was the Franciscan, Petrus a Cornibus, whom Buchanan, Beza, Rabelais, and others have also satirized.[2] It runs, as I recollect, thus:

"Sunt monachi nequam; nequam non unus et alter:
Præter Petrum omnes: est sed et hic monachus."

The English imitation was written by Porson upon Gottfried Hermann (when this was written, confessedly the prince of Greek scholars), who when hardly twenty had attacked Porson's famous canons, in his work, *De Metris Græcorum et Romanorum*. The merit of the epigram does not certainly lie in its truth.

"The Germans in Greek,
Are sadly to seek;
Not five in five score,
But ninety-five more;
All, save only Hermann,
And Hermann 's a German."

In these epigrams, the conclusion of the syllogism is suppressed, yet its illative force is felt even in spite of the express exception; nay, in really conquering by implication the apparent disclaimer, consists the whole point and elegance of the epigram. To put the former into a syllogistic shape, —

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[1] The original is an epigram of Phocylides, preserved by Strabo, B. x. p. 487, ed. Casaubon, 1620. Compare *Anthologia Græca*, i. p. 54, ed. Brunck. Lips., 1794. *Poetæ Minores Græci*, ed. Gaisford, i. p. 444.

Καὶ τόδε φωκυλίδεω· Λέριοι κακοί· οὐχ
ὁ μὲν, ὃς δ' οὔ·
Πάντες, πλὴν Προκλέους· καὶ Προκλέης
Λέριος.

For the Latin imitation by Stephanus, see *Theod. Bezæ Poemata, item ex Georgio Buchanano, aliisque variis insignibus poetis excerpta carmina. Excudebat H. Stephanus, ex cujus etiam Epigrammatis Græcis et Latinis aliquot cæteris adjecta sunt*, 1569, p. 217.

The parody by Porson is given in *A Short Account of the late Mr Richard Porson, M. A.*, p. 14, London, 1808. The original Greek, with Porson's imitation, is also given in Dr. Wellesley's *Anthologia Polyglotta*, p. 433 — ED.

[2] See Buchanan, *Franciscanus*, l. 764. Beza, *Poemata*, p. 85, ed. 1569. Rabelais, L. iii. ch. 14. — ED.

Sumption — *The monks, one and all, are good-for-nothing varlets, excepting Peter;*
Subsumption — *But Peter is a monk.*

Now, what is, what must be, understood to complete the sense? — Why, the conclusion, —

*Therefore, Peter is a good-for-nothing varlet like the rest.*

There is recorded, likewise, a dying deliverance of the philosopher Hegel, the wit of which depends upon the same ambiguous reasoning. "Of all my disciples," he said, "one only understands my philosophy; and he does not."[1] But we may take this for an admission by the philosopher himself, that the doctrine of the Absolute transcends human comprehension.

What has now been said, may suffice to show, not only that we may have enthymemes with any of the three propositions understood, but that the distinction itself of the enthymeme, as a species of syllogism, is inept.

C. Syllogisms, Regular and Irregular.

I now go on to the Third Division of Syllogisms, under the head of their External or Accidental form, — I mean the division of syllogisms into Regular and Irregular, — a distinction determined by the ordinary or extraordinary arrangement of their constituent parts. I commence this subject with the following paragraph.

Par. LXXIII. Kinds of Irregular Syllogisms.

¶ LXXIII. A syllogism is Irregular by relation, — 1°. To the transposed order of its Propositions; 2°. To the transposed order of its Terms; and 3°. To the transposed order of both its Propositions and Terms. Of these in their order.

1°. A syllogism in extension is Regular, in the order of its Propositions, when the subsumption follows the sumption, and the conclusion follows the subsumption. In this respect (discounting the difference of the quantities of depth and breadth), it, therefore, admits of a fivefold irregularity under three heads, — for either, 1°. The two premises may be transposed; or, 2°. The conclusion may precede the premises, and here, either the sumption or the subsumption may stand first; or, 3°. The conclusion may be placed between the premises, and here either the sumption or the subsumption may stand first. Thus, representing the sumption, subsumption, and conclusion by the letters A, B, C, we have, besides the regular order, 1°. B, A, C, — 2°. C,

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[1] See *Discussions*, p. 788. — ED.

A, B, — 3°. C, B, A, — 4°. A, C, B, — 5°. B, C, A. (This doctrine of the logicians is, however, one-sided and erroneous.)

2°. A syllogism is Regular or Irregular, in respect to the order of its Terms, according to the place which the middle term holds in the premises. It is regular, in Comprehensive Quantity, when the middle term is the predicate of the sumption and the subject of the subsumption; — in Extensive Quantity, when the middle term is the subject of the sumption and the predicate of the subsumption. From the regular order of the terms there are three possible deviations, in either quantity. For the middle term may occur, 1°. Twice as predicate; 2°. Twice as subject; and, 3°. In Comprehensive Quantity, it may in the sumption be subject, and in the subsumption predicate; in Extensive Quantity, it may in the sumption be predicate, and in the subsumption subject. Taking the letter M to designate the middle term, and the letters S and P to designate the subject and predicate of the conclusion, the following scheme will represent all the possible positions of the middle term, both in its regular and its irregular arrangement. The Regular constitutes the First Figure; the Irregular order the other Three.[1]

A. — In Comprehension.

| I. | II. | III. | IV. |
|---|---|---|---|
| S *is* M. | S *is* M. | M *is* S. | M *is* S. |
| M *is* P. | P *is* M. | M *is* P. | P *is* M. |
| S *is* P. | S *is* P. | S *is* P. | S *is* P. |

B. — In Extension.

| I. | II. | III. | IV. |
|---|---|---|---|
| M *is* P. | P *is* M. | M *is* P. | P *is* M. |
| S *is* M. | S *is* M | M *is* S. | M *is* S. |
| S *is* P. | S *is* P | S *is* P. | S *is* P. |

These relative positives of the middle term in the premises, constitute, I repeat, what are called the *Four Syllogistic Figures* (σχήματα, *figuræ*); and these positions I have comprised in the two following mnemonic lines.

In Comprehension.

*Præ sub; tum præ præ; tum sub sub; denique sub præ.*

In Extension.

*Sub præ; tum præ præ; tum sub sub; denique præ sub.*[2]

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[1] Cf. Krug, *Logik*, § 104. — Ed.

[2] This formula for Extension is taken from Purchot, *Inst. Phil.*, *Logica*, t. i. c. iii. p. 199 The other line is the Author's own. — Ed.

Explication.

Irregularity in the external form of syllogism, arising from transposition of the Propositions.

Of these two kinds of irregularity in the external form of syllogisms, the former — that of propositions — is of far less importance than the latter — that of terms; and logicians have even thrown it altogether out of account, in their consideration of Syllogistic Figure. They are, however, equally wrong in passing over the irregular consecution of the propositions of a syllogism, as a matter of absolutely no moment; and in attributing an exaggerated importance to every variety in the arrangement of its terms. They ought at least to have made the student of Logic aware, that a syllogism can be perspicuously expressed not only by the normal, but by any of the five consecutions of its propositions which deviate from the regular order. For example, take the following syllogism:

That a syllogism can be perspicuously expressed by any of the five irregular consecutions of its Propositions.

*All virtue is praiseworthy;*
*But sobriety is a virtue;*
*Therefore, sobriety is praiseworthy.*

This is the regular succession of sumption, subsumption, and conclusion, in a syllogism of extension; and as all that can be said, on the present question, of the one quantity, is applicable, *mutatis mutandis*, to the other, it will be needless to show articulately that a syllogism in comprehension is equally susceptible of a transposition of its propositions as a syllogism in extension. Keeping the same quantity, to wit, extension, let us first reverse the premises leaving the conclusion in the last place (B, A, C).

*Sobriety is a virtue;*
*But all virtue is praiseworthy;*
*Therefore, sobriety is praiseworthy.*

This, it will be allowed, is sufficiently perspicuous. Let us now enounce the conclusion before the premises; and, under this head let the premises be first taken in their natural order (C, A, B).

*Sobriety is praiseworthy;*
*For all virtue is praiseworthy;*
*And sobriety is a virtue.*

Now let the premises be transposed (C, B, A).

*Sobriety is praiseworthy :*
*For sobriety is a virtue ;*
*And all virtue is praiseworthy.*

The regressive reasoning in both these cases is not less manifest than the progressive reasoning of the regular order.

In the last place, let us interpolate the conclusion between the premises in their normal consecution (A, C, B).

*All virtue is praiseworthy ;*
*Therefore, sobriety is praiseworthy ;*
*For sobriety is a virtue.*

Secondly, between the premises in their reversed order (B, C, A).

*Sobriety is a virtue ;*
*Therefore, sobriety is praiseworthy ;*
*For all virtue is praiseworthy.*[1]

In these two cases the reasoning is not obscure, though perhaps the expression be inelegant; for the judgment placed after the conclusion had probably been already supplied in thought on the enunciation of the conclusion, and, therefore, when subsequently expressed, it is felt as superfluous. But this is a circumstance of no logical importance.

It is thus manifest, that, though worthy of notice in a system of Logic, the transposition of the propositions of a syllogism affords no modifications of form yielding more than a superficial character. Logicians, therefore, were not wrong in excluding the order of the propositions as a ground on which to constitute a difference of syllogistic form: but we shall see that they have not been consistent, or not sufficiently sharp-sighted, in this exclusion; for several of their recognized varieties of form — several of the moods of syllogistic figure — consist in nothing but a reversal of the premises.

True doctrine of consecution.

Syllogism either Synthetic or Analytic.

In reality, however, there is no irregular order of the syllogistic propositions, except in the single case where the conclusion is placed between the premises. For a syllogism may be either called *Synthetic*, in case the premises come first, and the conclusion is last — (the case alone contemplated by the logicians); or it may be called *Analytic*, the proposition styled the conclusion preceding, the propositions called the premises following, as its reasons — (a case not contemplated by the logicians). The

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[1] Cf. Krug, *Logik*, § 104, Anmerk, i. — Ed.

Analytic and Synthetic syllogisms may again be each considered as in the quantity of Extension, or as in the quantity of Comprehension; in which cases, we shall have a counter-order of the premises, but of which orders, as indeed of such quantities, one alone has been considered by the logicians.

The natural and transposed order of the Syllogistic Terms.

Figures of Syllogism.

Three figures distinguished by Aristotle.

Fourth Figure attributed to Galen, but on slender authority.

First ascribed to Galen by Averroes

I now, therefore, go on to the second and more important ground of regularity and irregularity — the natural and transposed order of the Syllogistic Terms. The forms determined by the different position of the middle term by relation to the major and minor terms in the premises of a syllogism are called *Figures* (σχήματα, *figuræ*) — a name given to them by Aristotle.[1] Of these the first is, on the prevalent doctrine, not properly a figure at all, if by figure be meant in Logic, as in Grammar and Rhetoric, a deviation from the natural and regular form of expression. Of these figures the first three were distinguished by Aristotle, who developed their rules with a tedious minuteness sometimes obscure, and not always in the best order, but altogether with an acuteness which, if ever equalled, has certainly never been surpassed. The fourth, which Whately — at least in the former editions of his *Elements* — and other recent Oxford logicians seem to suppose to be, like the others, of Aristotelic origin, — we owe perhaps to the ingenuity of Galen. I say *perhaps*, for though in logical treatises attributed without hesitation to the great physician, as if a doctrine to be found in his works, this is altogether erroneous. There is, I am certain, no mention of the fourth figure in any writing of Galen now extant, and no mention of Galen's addition of that figure by any Greek or Latin authority of an age approximating to his own. The first notice of this Galenic Figure is by the Spanish Arabian, Averroes of Cordova, in his commentary on the *Organon*.[2] Averroes flourished above a thousand years posterior to Galen; and from his report alone (as I have also ascertained) does the prevalent opinion take its rise, that we owe to Galen this amplification (or corruption, as it may be) of the Aristotelic doctrines of logical figure. There has been lately published from manuscript, by Didot of Paris, a new logical treatise of Galen.[3] In this work, in which the syllogistic figures are detailed, there is no mention of a fourth figure. Galen, therefore, as far as we know, affords no exception to the other authors upon Logic. In these circumstances, it is needless to observe how slender is the testimony in favor of the report; and this is one of many others in which an idle story, once told and retailed, obtains universal credit as an established fact, in consequence of the prevalent ignorance of the futility of its foundation. Of the legitimacy of the Fourth Figure I shall speak, after having shown you the nature of its reasoning.

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[1] *Anal. Prior*, i. 4. — ED. [Cf. Pacins, *Comment.*, pp. 118. 122.]

[2] *Prior Analytics*, [B. i. ch. 8. — ED.]

[3] Γαληνοῦ Εἰσαγωγὴ Διαλεκτική — ἐν Παοισιῷ ᾳωμδ΄ (1844) — ED.

Complex modification of the Figure of Syllogism.

Before proceeding further in the consideration of the Figure of Syllogism, it is, however, necessary to state a complex modification to which it is subject, and which is contained in the following paragraph.

Par. LXXIV. Syllogistic Moods.

> ¶ LXXIV. The Figure of Syllogism is modified by the Quantity and Quality of the propositions which constitute the reasoning. As the combination of Quantity and Quality affords four kinds of propositions — Universal Affirmative (A), Universal Negative (E), Particular Affirmative (I), Particular Negative (O); and as there are three propositions in each syllogism, there are consequently in all sixty-four arrangements possible of three propositions, differing in quantity and quality; — arrangements which constitute what are called the *Syllogistic Moods* (*τρόποι, modi*). I may interpolate the observation: The Greek logicians after Aristotle, looking merely to the two premises in combination, called these *Syzygies* (*συζυγίαι, jugationes, conjugationes, combinationes*). Aristotle himself never uses *τρόπος* for either mood or modality specially; nor does he use *συζυγία* in any definite sense. His only word for mood is the vague expression *syllogism*.
>
> The greater number of these moods are, however, incompetent, as contradictory of the general rules of syllogism; and there are in all only eleven which can possibly enter a legitimate syllogism. These eleven moods again are, for the same reason, not all admissible in every figure, but six only in each, that is, in all twenty-four; and again of these twenty-four, five are useless, and, therefore, usually neglected, as having a particular conclusion where a universal is competent. The nineteen useful moods admitted by logicians may, however, by the quantification of the predicate, be still further simplified, by superseding the significance of Figure.

Explication.

In entering on the consideration of the various Moods of the Syllogistic Figures, it is necessary that you recall to memory the three laws I gave you of the Categorical Syllogism, and in particular the two clauses of the second law, — That the sumption must be definite (general or singular), and the subsumption affirmative, — clauses which are more vaguely expressed by the two laws of the logicians — that no conclusion can be drawn from two particular premises — and that no conclusion can be drawn from two negative premises. This being premised, you recollect that the four combinations of Quantity and Quality, competent to a proposition, were designated by the four letters, A, E, I, O, — A denoting a universal affirmative; — E a universal negative; — I, a particular affirmative; — O, a particular negative.

Asserit A; negat E; verum universaliter ambæ:
Asserit I; negat O; sed particulariter ambo.[1]

A, it affirms of this, these, all;
As E denies of any:
I, it affirms, as O denies,
Of some, or few, or many.
Thus A affirms what E denies,
And definitely either;
Thus I affirms what O denies,
But definitely neither.[2]

The possible combinations of premises.

Now, as each syllogism has two premises, there are, consequently, sixteen different combinations possible of premises differing in quantity and quality — viz.:

| | | | |
|---|---|---|---|
| 1) A A. | 2) E A. | 3) I A. | 4) O A. |
| A E. | E E. | I E. | O E. |
| A I. | E I. | I I. | O I. |
| A O. | E O. | I O. | O O. |

Now the question arises — are all of these sixteen possible combinations of different premises valid towards a legitimate conclusion? In answer to this, it is evident that a considerable number of these are at once invalidated by the first clause of the second law of the categorical syllogism, in so far as recognized by logicians, by which all moods with two particular premises are excluded, as in these there is no general rule. Of this class are the four moods, I I, I O, O I, and O O. And the second clause of the same law, in so far as recognized by logicians, invalidates the moods of two negative premises, as in these there is no subordination. Of this class are the four moods E E, E O, O E, and O O. Finally, by the two clauses of the second rule in conjunction, the mood I E is said to be excluded, because the particular sumption contains no general rule, and the negative subsumption no subordination. (This, I think, is incorrect.) These exclusions have been admitted to be valid for every Figure; there, consequently, remain (say the logicians) as the possible modes of any legitimate syllogism, the eight following — A A, A E, A I, A O, E A, E I, I A, O A;[1] but some of these, as apparently contradictory of the second rule in its more definite assertions, — that the sumption must be general and the subsumption affirmative, — I shall, after stating to you the common doctrine of the logicians, show to be really no exceptions.

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[1] See above, p. 180. — Ed.

[2] [The following are previous English metrical versions of these lines:

"A doeth affirme, E doeth denigh, which are bothe universall:
I doeth affirme, O doeth denigh, which we particular call."

— Wilson, *Rule of Reason*, p. 27 a, 1551.

"A says and E denies; both totally.
I says and O denies; both partially."

— Wallis, *Institutio Logicæ*, 1686, L. ii. c. 4, p 105 ]

How many of these are syllogistically valid.

Whether each mood that is *a priori* possible affords a proper syllogism in all the figures.

But whether each of the moods, though *a priori* possible, affords a proper syllogism in all the figures — this depends on the definite relations of the middle term to the two others in the several figures. These, therefore, require a closer investigation. I shall consider them, with the logicians, principally in the quantity of extension, but, *mutatis mutandis*, all that is true in the one quantity is equally true in the other.

First Figure.

Now if, in the first figure, we consider these eight moods with reference to the general rules, we shall find that all do not in this figure afford correct syllogisms; but only those which are constructed in conformity to the following particular rules, which are, however, in this figure, identical with those we have already given as general laws of every perfect and regular categorical syllogism.

The symbol of the First Figure is, —

$$\left.\begin{matrix}\text{M P,}\\ \text{S M,}\end{matrix}\right\}\text{ for Extension; }\quad \left.\begin{matrix}\text{S M,}\\ \text{M P,}\end{matrix}\right\}\text{ for Comprehension.}$$

The first rule is, — "The sumption must be universal. Were it particular, and, consequently, the subsumption universal, as:

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[1] Cf. Bachmann, *Logik*, § 129 — Ed.

*Some* M *are* P;  
*But all* S *are* M;

we could not know whether S were precisely the part of M which lies in P, and it might be altogether out of P. In that case, a universal negative conclusion would be the correct; but this cannot be drawn, as there is no negative premise, and though accidentally perhaps true, still it is not a necessary consequence of the premises."[1]

"The second rule is, — The subsumption must be affirmative. Were it negative, and consequently the sumption affirmative, in that case S would be wholly excluded from the sphere of M; and, consequently, the general rule under which M stands would not be applicable to S. Thus:

*All* M *are* P;  
*No* S *is* M;  
*No* S *is* P.  
*All colors are physical phænomena;*  
*No sound is a color;*  
*Therefore, no sound is a physical phænomenon.*

"Here the negative conclusion is false, but the affirmative, which would be true, — *all sounds are physical phænomena*, — cannot be inferred from the premises, and, therefore, no inference is competent at all."[2]

Legitimate moods of First Figure. Their symbols

Thus, in this figure, of the eight moods generally admissible, I A and O A are excluded by the first; A E and A O by the second rule. There remain, therefore, only four legitimate moods, A A, E A, A I, and E I. The lower Greek logicians denoted them by the terms, —

Γράμματα, Ἔγραψε, Γραφίδι, Τεχνικός;[3]

the Latin schoolmen by the terms —

*Barbara*, *Celarent*, *Darii*, and *Ferio*.

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[1] Bachmann, *Logik*, § 130, p. 203. — Ed. [So Hollmann, *Phil. Rationalis, quæ Logica vulgo dicitur*, § 461, Gottingæ, 1746. Lovanienses, *Commentaria in Isag. Porphyrii et in omnes Libros Arist. de Dialectica*, *Anal. Prior*, L. i. p. 215, Lovanii, 1547. Ulrich, *Instit. Log. et Met.*, § 191, Ienæ, 1785. Fonseca, *Instit. Dial.*, L. vi. c. 21, p. 363.]

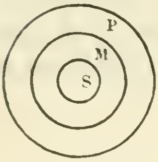
[2] Bachmann, as above. — Ed. [Cf. Derodon, *Logica Restituta*, P. iv. p. 618. Ulrich, as above. Lovanienses, as above. Hollmann, *Logica*, § 462.]

[3] For an account of these mnemonics, see *Discussions*, p. 671, second edition. — Ed

In the Latin symbols, which are far more ingenious and complete, and in regard to the history of which I shall say something in the sequel, the vowels are alone at present to be considered, and of these the first expresses the sumption, the second the subsumption, and the third the conclusion. The correctness of these is shown by the following examples and delineations.

"The first mood of this figure:

I. Barbara.

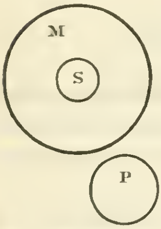


I. BARBARA.

*All* M *are* P;
*All* S *are* M;
*Therefore, all* S *are* P.

*All that is composite is dissoluble;*
*All material things are composite;*
*Therefore, all material things are dissoluble.*

II. Celarent.

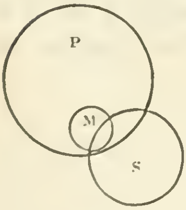


II. CELARENT.

*No* M *is* P;
*All* S *are* M;
*Therefore, no* S *is* P.

*No finite being is exempt from error;*
*All men are finite beings;*
*Therefore, no man is exempt from error.*

III. Darii.



III. DARII.

*All* M *are* P;
*Some* S *are* M;
*Therefore, some* S *are* P.

*All virtues are laudable;*
*Some habits are virtues;*
*Therefore, some habits are laudable.*

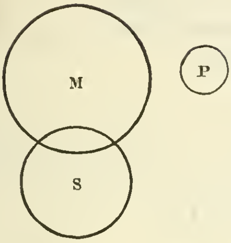
"This diagram makes it manifest to the eye why the conclusion can only be particular. As only a part of the sphere S lies in the sphere M, this part must lie in the sphere P, as the whole of M lies therein; but it is of this part only that anything can be affirmed in the conclusion. The other part of S can either lie wholly out of P, or partly in P but out of M; but as the premises affirm nothing of this part, the conclusion cannot, therefore, include it.

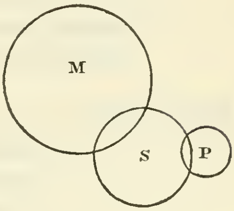
IV. Ferio.

### IV. FERIO.

*No* M *is* P;
*Some* S *are* M;
*Therefore, some* S *are not* P.

*No virtue is reprehensible;*
*Some habits are virtues;*
*Therefore, some habits are not reprehensible.*





"The conclusion in this case can only be particular, as only a part of S is placed in the sphere of M. The other part of S may lie out of P or in P. But of this the premises determine nothing."[1]

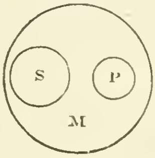
Second Figure. The symbol of the Second Figure is —

$\left.\begin{matrix}\text{P M,}\\ \text{S M,}\end{matrix}\right\}$ for Extension; $\left.\begin{matrix}\text{S M,}\\ \text{P M,}\end{matrix}\right\}$ for Comprehension.

Its rules. "This figure is governed by the two following rules. Of these the first is — One premise must be negative.[2] For were there two affirmative premises, as:

*All* P *are* M;
*All* S *are* M;

*All metals are minerals;*
*All pebbles are minerals;*



the conclusion would be — *All pebbles are metals*, which would be false.

"The second rule is: — The sumption must be universal.[3] Were the sumption particular, the subsumption behooved to be universal; for otherwise no conclusion would be possible. But in that case the sumption, whether affirmative or negative, would afford only an absurd conclusion.[1]

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[1] Bachmann, *Logik*, p. 204—206. — ED.

[2] [See Derodon, *Logica Restituta*, P. iv. p. 637. Hollmann, *Logica*, §§ 463, 464. Lovanienses, *Com. in Arist. Anal. Prior.*, L. i. p. 218. Scotus.] [*Quæstiones in Anal. Prior.*, L. i. q 20, f. 268. — ED.]

[3] See Hollmann, and Lovanienses, as cited above. — ED.

"If affirmative, as —

*Some* P *are* M;
*No* S *is* M;
*Therefore, some* S *are not* P.

*Some animals lay eggs,* i. e. *are egg-laying things;*
*No horse lays eggs,* i. e. *is any egg-laying thing;*
*Therefore, some horses are not animals.*

"If negative, as —

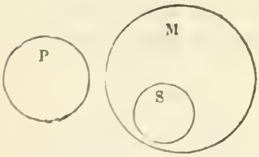
*Some* P *are not* M;
*All* S *are* M;
*Therefore, some* S *are not* P.

*Some minerals are not precious stones;*
*All topazes are precious stones;*
*Therefore, some topazes are not minerals;*

in both cases the conclusion is absurd.

"There thus remain," say the logicians, "only the moods *Cesare*, *Camestres*, *Festino*, *Baroco*.

I. Cesare.

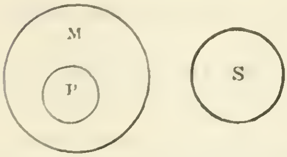


I. CESARE.

*No* P *is* M;
*All* S *are* M;
*Therefore, no* S *is* P.

*Nothing material has free will;*
*All spirits have free will:*
*Therefore, no spirit is material.*

II. Camestres.



II. CAMESTRES.

*All* P *are* M;
*No* S *is* M;
*Therefore, no* S *is* P.

*All colors are visible;*
*No sound is visible;*
*Therefore, no sound is a color.*

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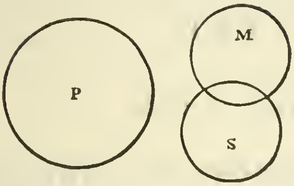
[1] [Cf. Fonseca, *Instit. Dial.*, L. vi. c. 21, p. 363.]

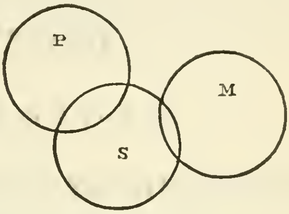
III. Festino.

*No* P *is* M;
*Some* S *are* M;
*Therefore, some* S *are not* P.

III. FESTINO.

*No vice is praiseworthy;*
*Some actions are praiseworthy;*
*Therefore, some actions are not vices.*





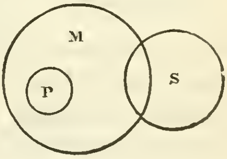
"The diagram here is alternative, for as the conclusion can only comprise a part of S, as it is only the consequence of a partial subordination of S to M, the other parts of S which are out of M may either lie within or without P. — The conclusion can, therefore, only be particular.

IV. Baroco.

IV. BAROCO.

*All* P *are* M;
*Some* S *are not* M;
*Therefore, some* S *are not* P.

*All birds are oviparous;*
*Some animals are not oviparous;*
*Therefore, some animals are not birds."*[1]



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[1] Bachmann, *Logik*, as above. — ED.

# LECTURE XXI.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT.

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO EXTERNAL FORM.

### FIGURE—THIRD AND FOURTH.

Recapitulation.

In our last Lecture, after terminating the general consideration of the nature of Figure and Mood in Categorical Syllogisms, we were engaged in a rapid survey of the nineteen legitimate and useful moods belonging to the four figures, according to the received doctrine of logicians (consequently, exclusively in Extension); and I had displayed to you the laws and moods of the First and Second Figures. Before, therefore, proceeding to any criticism of this doctrine, it behooves us to terminate the view of the two remaining figures.

Third Figure.

To each of the first two figures, logicians attribute four moods; to the third they concede six; and to the fourth five. The scheme of the Third Figure, in Extension, is—

M P,
M S.

Its rules.

This figure (always in extension) is governed by the two following laws:—the first is, "The subsumption must be affirmative.[1] Were the minor premise a negative, as in the syllogism,—

| | | |
|---|---|---|
| *All M are P;*<br>*No M is S;* | or | *All fiddles are musical instruments;*<br>*But no fiddle is a flute;* |

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[1] [See Aristotle, *Anal. Prior.*, i. 6, §§ 8, 16. Hollmann, *Logica*, § 466. Lovanienses, *In An. Prior.*, L. i. p. 220.]

here the conclusion would be ridiculous, — *Therefore, no* S *is* P, — *Therefore, no flute is a musical instrument.* For M and S can both exclude each other, and yet both lie within the sphere of P.

"The second law is, — The conclusion must be particular, and particular although both premises are universal.[1] This may be shown both in affirmative and negative syllogisms. In the case of affirmative syllogisms, as:

*All* M *are* P;
*But all* M *are* S;

here, you will observe, M lies in two different spheres — P and S, and these must in the conclusion be connected in a relation of subordination. But S and P may be disparate notions,[2] and, consequently, not to be so connected; an absurd conclusion would, therefore, be the result. For example, —

*All birds are animals with feathers;*
*But all birds are animals with a heart;*
*Therefore, all animals with a heart are animals with feathers*

"Again," say the logicians, "in regard to negatives: — In these only the sumption can be negative, as the subsumption (by the first rule) must be affirmative. Thus:

| | | |
|---|---|---|
| *No* M *is* P;<br>*But all* M *are* S; | or, | *No silver is iron;*<br>*But all silver is a mineral.* |

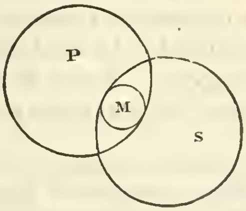
"Here the conclusion — *No* S *is* P, — *No mineral is iron*, would be false.

"Testing the eight possible moods in Extension by these special rules, there remain for this figure, six, which by the Latin logicians have been named, *Darapti*, *Felapton*, *Disamis*, *Datisi*, *Bocardo*, *Ferison.* The first mood of this figure is:

I Darapti.

I. Darapti.[3]

*All* M *are* P;
*But all* M *are* S;
*Therefore, some* S *are* P;
or,
*All gilding is metallic;*
*All gilding shines;*
*Therefore, some things that shine are metallic.*



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[1] [But see Hollmann, *Logica*, §§ 332, 458. Lovanienses, *In An. Prior.*, L. i. p. 220.]

[2] *Disparate notions, i. e.*, coördinate parts of the comprehension of their common subject M. See above, p. 158. — Ed.

[3] [Some of the ancient logicians, among

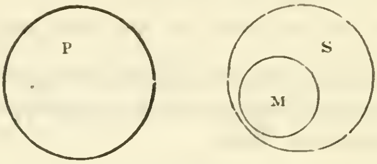
"Here it is manifest that M cannot at once lie in two different spheres, unless these partially involve, partially intersect each other. But only partially; for as both P and S are more extensive than M, and are both only connected through M (*i.e.* through a part of themselves), they cannot, except partially, be identified with each other.

"The second mood of this figure is, —

II Felapton.

II. FELAPTON.[1]

*No* M *is* P;
*But all* M *are* S;
*Therefore, some* S *are not* P;
or,
*No material substance is a moral subject;*
*But all that is material is extended;*
*Therefore, something extended is not a moral subject.*



"You will observe, that according to this diagram, the conclusion ought to be — No S is P, because the whole of S lies out of the sphere of P; and as in the concrete example, the notion *extended* is viewed as out of the notion *moral subject*, we might conclude, — *Nothing extended is a moral subject.* But this conclusion, though materially correct, cannot, however, be formally inferred from the premises. In the sumption, indeed, the whole of M is excluded from the sphere of P; but in the subsumption M is included in the sphere S, that is, we think that the notion M is a part of the notion S. Now in the conclusion, S is brought under P, and the conclusion of a categorical syllogism, in reference to its quantity, is, as you remember, by the third general law regulated by the quality of the subsumption. But as in the present case the subsumption, notwithstanding the universality of the expression, only judges of a part of

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others Porphyry, have made two moods of Darapti, as Aristotle himself does in Cesare and Camestres, in Disamis and Datisi. See Boethius, *De Syllogismo Categorico*, L. ii., *Opera*, p 594 *alibi*. Cf. Zabarella, *Opera Logica*, *De Quarta Figura Syllog.*, pp. 119, 120 *et seq.* Alex. Aphrodisiensis, *In Anal. Prior*, i. 5, ff. 23, 24, Ald. 1531. Philoponus, *In Anal. Prior.*, L. i. c. 5, f. 18 b. Apuleius. *De Habitud. Doct. Plat.*, L. iii. *Opera*, p. 37, 38. ed. Elmenhorst.]

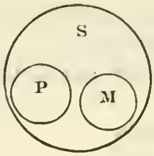
[1] [Aristotle gives Fapemo, *Anal. Prior.* i. 7. (Burgersdyck, *Instit. Logicæ*, L. ii c. 7, p 199, Cantab., 1647.)]

S; the conclusion can, in like manner, only judge of a part of S. Of the other parts of S there is nothing enounced in the premises. The relation between S and P could likewise be as follows:

*No* M *is* P;
*But all* M *are* S;

or,

*No pigeon is a hawk;*
*But all pigeons are birds;*



"Here the conclusion could not be a universal negative, — *Therefore, no* S *is* P, — *Therefore, no bird is a hawk* — for the sphere of S (*bird*) is greater than that of either M (*pigeon*) or P (*hawk*); it may, however, be a particular negative — *Therefore, some* S *are not* P (*therefore, some birds are not hawks*), — because the sumption has excluded M and P (*pigeon* and *hawk*) from each other's sphere, and, consequently, the part of S which is equal to M is different from the part of S which is equal to P. — But if this be the case when the subsumption has a universal expression, the same, *a fortiori*, is true when it is particular.

"The third mode of this figure is:

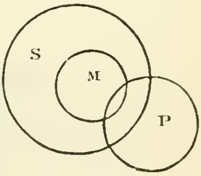
III. Disamis

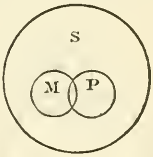
III. Disamis.

*Some* M *are* P;
*But all* M *are* S;
*Therefore, some* S *are* P;

or,

*Some acts of homicide are laudable;*
*But all acts of homicide are cruel;*
*Therefore, some cruel acts are laudable.*





"The fourth mood of this figure is:

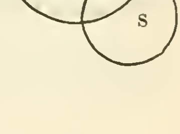
IV. Datisi.

IV. Datisi.

*All* M *are* P;
*But some* M *are* S;
*Therefore, some* S *are* P;

or,

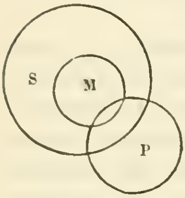
*All acts of homicide are cruel;*
*Some acts of homicide are laudable;*
*Therefore, some laudable acts are cruel.*



'This diagram makes it manifest that more than a single case is possible in this mood. As the subsumption is particular, the conclusion can only bring that part of S which is M into identity with P; of the other parts of P there can be nothing determined, and these other parts, it is evident, may either lie wholly out of, or partly within, P.

"The fifth mood of this figure is:

V. Bocardo.



### V. Bocardo.

*Some* M *are not* P;
*But all* M *are* S;
*Therefore, some* S *are not* P;

or,

*Some syllogisms are not regular;*
*But all syllogisms are things important;*
*Therefore, some important things are not things regular.*

"The sixth mood of this figure is:

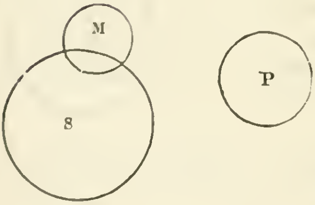
VI. Ferison.

### VI. Ferison.

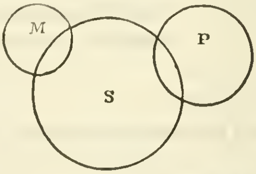
*No* M *is* P;
*But some* M *are* S;
*Therefore, some* S *are not* P;

or,

*No truth is without result;*
*Some truths are misunderstood;*
*Therefore, some things misunderstood are not without result.*



or,



"Here, as in the premises, only that part of S which is M is excluded from P, consequently the other parts of S may either likewise lie wholly out of P, or partially in P."[1]

So much for the moods of the third figure.

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[1] Bachmann, *Logik*, § 132, p. 211—218. — Ed.

Fourth Figure.

"The formula of the Fourth Figure is:

P M,
M S.

Its Laws.

"This figure is regulated by three laws.

"I. Of these the first is, — If the sumption be affirmative, the subsumption must be universal. The necessity of this law is easily seen. For if we had the premises:

*All* P *are* M;
*But some* M *are* S;

in this case M may, or may not, be a notion superior to P.

"On the former alternative, if M be higher than P, and likewise higher than S, then the whole of S might be contained under P. — In this case, the proper conclusion would be a universal affirmative; which, however, cannot follow from the premises, as the subsumption, *ex hypothesi*, is particular. On the latter alternative, even if M were not superior to S, still, since P is only a part of M, we could not know whether a part of S were contained under P or not. For example:

*All men are animals;*
*But some animals are amphibious.*

"From these premises no conclusion could be drawn.

"II. The second rule by which this figure is governed is — If either premise be negative, the sumption must be universal.

"Suppose we had the premises —

*Some* P *are not* M;
*But all* M *are* S;
*Therefore, some* S *are not* P;

or,

*Some animals are not feathered;*
*But all feathered animals are birds;*
*Therefore, some birds are not animals.*

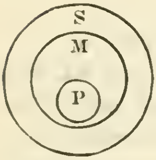
"In this case the whole of S lies within the sphere of P; there cannot, therefore, follow a particular negative conclusion, and if not that, no conclusion at all. The same would happen were the sumption a particular affirmative, and the subsumption a universal negative.

"III. The third rule of the fourth figure is — If the subsumption be affirmative, the conclusion must be particular. This (the logicians say) is manifest. For in this figure S is higher than M, and higher than P, consequently only a part of S can be P.

"If we test by these rules the eight possible moods, there are in this figure five found competent, which, among sundry other names, have obtained the following: *Bramantip*, *Camenes*, *Dimaris*, *Fesapo*, *Fresison*.

"Of these moods the first is:

I Bramantip.



I. Bramantip, otherwise Bamalip, etc.

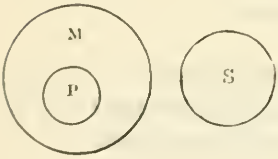
*All* P *are* M;
*All* M *are* S;
*Therefore, some* S *are* P;

or,

*All greyhounds are dogs;*
*But all dogs are quadrupeds;*
*Therefore, some quadrupeds are greyhounds.*

"The second mood is called:

II. Camenes.



II. Camenes, Calemes, or Calentes, etc.

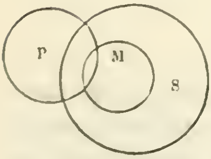
*All* P *are* M;
*But no* M *is* S;
*Therefore, no* S *is* P;

or,

*All ruminating animals have four stomachs;*
*But no animal with four stomachs is carnivorous;*
*Therefore, no carnivorous animal ruminates.*

"The third mood in the fourth figure is variously denominated:

III. Dimaris.



III. Dimaris, or Dimatis, or Dibatis, etc.

*Some* P *are* M;
*But all* M *are* S;
*Therefore, some* S *are* P;

or,

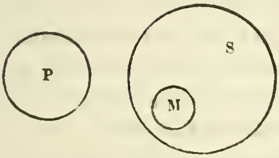
*Some practically virtuous men are necessitarians;*
*All necessitarians speculatively subvert the distinction of vice and virtue;*
*Therefore, some who speculatively subvert the distinction of vice and virtue are practically virtuous men.*

"The fourth mood of this figure is:

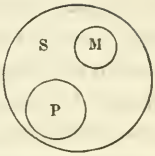
**IV. Fesapo.**

IV. Fesapo.

*No* P *is* M;
*All* M *are* S;
*Therefore, some* S *are not* P;
or,
*No negro is a Hindoo;*
*But all Hindoos are blacks;*
*Therefore, some blacks are not negroes;*



or,



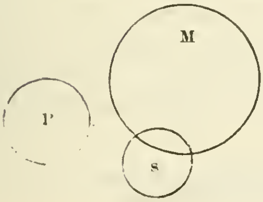
"According to the first of these diagrams, all S is excluded from P, and thus the conclusion would seem warranted that—*No* S *is* P. This conclusion cannot, however, be inferred; for it would violate the third rule of this figure. For while we, in the sumption, have only excluded M, that is, a part of S, from P, and as the other parts of S are not taken into account, we are, consequently, not entitled to deny these of P. The first diagram, therefore, which sensualizes only a single case, is not coädequate with the logical formula, and it is necessary to add the second in order to exhaust it. The second diagram is, therefore, likewise a sensible representation of Fesapo; and that diagram makes it evident that the conclusion can only be a particular negative.

"The fifth and last mood is:

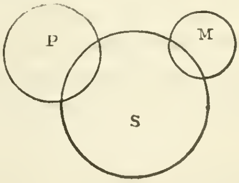
**V. Fresison.**

V. Fresison.

*No* P *is* M;
*But some* M *are* S;
*Therefore, some* S *are not* P;
or,
*No moral principle is an animal impulse;*
*But some animal impulses are principles of action;*
*Therefore, some principles of action are not moral principles.*



or,



"The demonstration is here the same as in the former mood. Since the subsumption only places a part of M in the sphere of S, the conclusion, whose quantity is determined by the subsumption, can only deny P of that part of S which is likewise a part of M."[1]

Mood and Figure in Comprehension.

Criticism of the foregoing doctrines of logical forms.

Having thus concluded the exposition of the various Figures and Moods of Syllogisms, as recognized by logicians, in reference to Extensive Quantity, it will not be necessary to say more than a word in general, touching these figures and moods in reference to Comprehensive Quantity. Whatever mood and figure is valid and regular in the one, is valid and regular in the other; and every anomaly is equally an anomaly in both. The rules of the various figures which we have considered in regard to syllogisms in Extension, are all, without exception or qualification, applicable to syllogisms in Comprehension, with this single proviso, that, as the same proposition forms a different premise in the several quantities, all that is said of the sumption in extension, should be understood of the subsumption in comprehension, and all that is said of the sumption in comprehension, should be understood of the subsumption in extension. What, therefore, has hitherto been, or may hereafter be, stated of the mood and figure of one quantity, is to be viewed as applicable, *mutatis mutandis*, to the other. This being understood, I proceed, in the first place, to show you that the complex series of logical forms which I have enumerated may be considerably diminished, and the doctrine of syllogism, consequently, reduced to a higher simplicity. In doing this I shall consider, first, the Figures, and, secondly, their Moods.

I. The Figures.

The Fourth.

Now, as regards the number of the Figures, you are aware, from what I formerly stated, that Aristotle only contemplated the three first, and that the fourth, which is, by those who do not mistake it for an Aristotelic form, referred with little probability to Galen, was wholly unnoticed until the end of the twelfth or the beginning of the thirteenth century, when it was incidentally communicated, as an innovation of the physician of Pergamus, by the celebrated Averroes, in his commentary on the *Prior Analytics* of Aristotle, but by Averroes himself rejected as an illegitimate novelty.[2] The notice of this figure by the commentator was, however, enough; and though repudiated by the great majority of the rigid Aristotelians, the authority of Scotus, by whom it was defended,[1] secured for it at last, if not a universal approval, at least a very general toleration, as a legitimate though an awkward form. The arguments indeed by which it was attempted to evince the incompetency of this figure, were not of a character calculated to enforce assent; for its inference is not less valid than that of any other, — however tortuous and perverse it may be felt to be. In fact, the logicians, in consequence of their exclusive recognition of the reasoning in extension, were not in possession of the means of showing, that this figure is a monster undeserving of toleration, far less of countenance and favor. I shall not, therefore, trouble you with the inconclusive reasoning on the part either of those who have assailed or of those who have defended this figure, but shall at once put you in possession of the ground on which alone, I think, its claim to recognition ought to be disallowed.

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[1] Bachmann, *Logik*, § 193, p 218—223.— Ed

[2] *In Anal Prior*, i. 8. *Opera Aristotelis*, t. I., f. 78. Venetiis, 1560. — Ed.

Grounds on which the Fourth Figure ought to be disallowed.

In the first place, then, you are aware that all reasoning is either in the quantity of comprehension, or in the quantity of extension. You are aware, in the second, that these quantities are not only different, but, as existing in an inverse ratio of each other, opposed. Finally, in the third place, you are aware that, though opposed, so that the maximum of the one is the minimum of the other, yet the existence of each supposes the existence of the other; accordingly there can be no extension without some comprehension, — no comprehension without some extension.

A cross inference possible from Extension to Comprehension and *vice versa*.

This being the case, it is evident that, besides the definite reasoning from whole to part, and from parts to whole, within the several quantities and in their perpendicular lines, there is also competent an indefinite inference across from the one quantity to the other. For if the existence of the one quantity be only possible under the condition of the other, we may always, it is self-evident, in the first place, from the affirmation of anything in extension, indefinitely affirm it in comprehension, as, reciprocally, from the affirmation of anything in comprehension, we may indefinitely affirm it in extension; and, in the second place, from the negation of anything in extension, we may absolutely deny it in comprehension, as, reciprocally, from the negation of anything in comprehension, we may absolutely deny it in extension.

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[1] This statement is marked as doubtful in the Author's Common-place Book. Scotus (*Quæst. in Anal. Prior.*, i. q. 34) expressly rejects the Fourth Figure. He says: "Solum tribus modis potest fieri debita ordinatio respectu extremorum secundum subjectionem et prædicationem; igitur tres figuræ et non plures . . . . quia per solam transpositionem non pervenit diversitas alicujus præmissæ nec conclusionis: per consequens nec diversitas figuræ."

The Fourth Figure is, however, said by Ridiger (*De Sensu Veri et Falsi*, p. 337) to have been introduced by Galen and Scotus. Hospinianus (*De Controversiis Dialecticis*, c. xix.) attributes (erroneously) the invention of this figure to Scotus. Compare also Noldius. *Logica Recognita*, c. xiii. § 4, p. 277. — ED.

This the nature of the inference in the Fourth Figure.

Now, what has not been observed, such is exclusively the inference in the Fourth Figure; its two last rules are in fact nothing but an enunciation of these two conditions of a cross inference from the one quantity to the other; and the first rule will be hereafter shown to be only an error, the result of not observing that certain moods are only founded on the accident of a transposed order of the premises, and, therefore, constitute no subject for a logical legislation.

Proved and illustrated.

To prove this statement of the nature of the inference in the fourth figure, it is only necessary to look at its abstract formula. In extension this is —

$$\begin{array}{c} P \textit{ is } M; \\ M \textit{ is } S; \\ \hline S \textit{ is } P. \end{array}$$

Here in the premises P is contained under M, and M is contained under S; that is, in the premises S is the greatest whole and P the smallest part. So far, this syllogism in extension is properly a syllogism in comprehension, in which the subject of the conclusion is the greatest whole, and its predicate the smallest part. From such premises we, therefore, expect, that the conclusion carrying out what was established in the antecedent, should affirm P as the part of S. In this, however, our expectation is disappointed; for the reasoning suddenly turns round in the conclusion, and affirms S as a part of P. And how, it may be asked, is this evolution in the conclusion competent, seeing that it was not prepared, and no warrant given for it in the premises. To this the answer is prompt and easy. The conclusion in this figure is solely legitimated by the circumstance, that from an identity between the two terms in one quantity, we may always infer some identity between them in the other, and from a non-identity between them in one quantity, we can always infer a non-identity in the other. And that in this figure there is always a transition in the conclusion from the one quantity, is evident; for that notion which in the premises was the greatest whole, becomes in the conclusion the smallest part; and that notion which in the premises was the smallest part, becomes in the conclusion the greatest whole. Now, how is this manœuvre possible? — how are we entitled to say that because A contains all B, therefore B contains some A? Only, it is clear, because there is here a change from the containing of the one quantity to the containing of the other; and because, each quantity necessarily implying the indefinite existence of the other, we are consequently permitted to render this necessary implication the ground of a logical inference.

This hybrid inference is, 1. Unnatural.

It is manifest, however, in the first place, that such a cross and hybrid and indirect reasoning from the one quantity to the other, in the fourth figure, is wholly of a different character and account from the reasoning in the other three figures, in which all inference, whether upwards or downwards, is equable and homogeneous within the same quantity. The latter in short is natural and easy; the former, unnatural and perverse.

2. Useless.

In the second place, the kind of reasoning competent in the fourth figure is wholly useless. The change from the one quantity to the other in the course of a syllogism is warranted by no necessity, by no expediency. The reasoning in each quantity is absolute and complete within itself, and all that can be accomplished in the one process can equally well be accomplished in the other. The jumping, therefore, from extension to comprehension, or from comprehension to extension, in the conclusion of the fourth figure, is a feat about as reasonable and useful in Logic, as the jumping from one horse to another would be reasonable and useful in the race-course. Both are achievements possible; but, because possible, neither is, therefore, a legitimate exercise of skill.

We may, therefore, on the ground that the fourth figure involves a useless transition from one quantity to another, reject it as a logical figure, and degrade it to a mere logical caprice.

3. Logically invalid.

But, in the third place, there is a better ground; the inference, though valid in itself, is logically, is scientifically, invalid. For the inference is only legitimated by the occult conversion of the one quantity into the other, which takes place in the mental process. There is thus a step taken in the reasoning which is not overtly expressed. Were the whole process stated in language, as stated it logically ought to be, instead of a simple syllogism with one direct conclusion, we should have a complex reasoning with two conclusions; one conclusion direct and immediate (the inference, to wit, of conversion), and from that immediate conclusion another mediate and indirect, but which, as it stands, appears as the one sole and exclusive conclusion from the premises. This ground, on which I think the fourth figure ought to be specially abolished, is stated with the requisite details in the Logical Appendix contained in the second edition of my *Discussions on Philosophy*.[1]

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[1] P. 663 — ED.

# LECTURE XXII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO EXTERNAL FORM.

### C. REGULAR AND IRREGULAR.

### FIGURE—REDUCTION.

Recapitulation.

In my last Lecture, after terminating the view of the nineteen Moods of the Four Syllogistic Figures, according to the doctrine of logicians, I entered on the consideration,—how far their doctrine concerning the number and legitimacy of these various figures and moods was correct. In the conduct of this discussion, I proposed, first, to treat of the Figures, and, secondly, to treat of the Moods. Commencing, then, with the Figures, it is manifest that no exception can possibly be taken to the first, which is, in point of fact, no figure at all, but the one regular,—the one natural form of ratiocination. The other three figures divide themselves into two classes. The one of these classes comprehends the fourth; the other, the second and third figures. The fourth figure stands, on the common doctrine of the logicians, in a more unfavorable situation than the second and third. It was not recognized by Aristotle; it obtained admission into the science at a comparatively recent period; it has never in fact been universally recognized; and its progress is manifestly more perverse, circuitous, and unnatural, than that of any other.

In regard to this fourth figure, I stated that the controversy among logicians touching its legitimacy had been without result; its opponents failing to show that it ought to be rejected; its defenders failing to show that it was deserving of recognition. I then stated that the logicians, in their one-sided view of the reasoning process, had let slip the one great principle on which the legitimacy of this figure was to be determined. I then explained to you that the peculiarity of the fourth figure consists in this, — that the premises are apparently the premises of a syllogism in one kind of quantity, while its conclusion is the converted conclusion of a syllogism in the other. It is thus in every point of view contorted and preposterous. Its premises are transposed, and the conclusion follows from these, not directly, but through the medium of a conversion. I showed how, and how far, this kind of reasoning was competent, and that though the inference in the fourth figure is valid, it is inconvenient and useless, and therefore, that the form itself, though undoubtedly legitimate, is still only a legitimate monster. Herewith the Lecture terminated.

General character of the Second, Third, and Fourth Figures.

Now, looking superficially at the matter, it might seem, from what has now been said, that the fourth ought to be at once expunged from the series of logical figures. But a closer examination will show us that this decision would be rash. In point of fact, all figure properly so called, that is, every figure, with the exception of the first, must be rejected equally with the fourth, and on the following ground, — that they do not, in virtue of their own expressed premises, accomplish their own inference, but that this is done by the mental interpolation of certain complementary steps, without which no conclusion in these figures could be drawn. They are thus in fact reasonings apparently simple, but in reality complex; and when the whole mental process is expressed, they are found to be all only syllogisms in the first figure, with certain corollaries of the different propositions intermingled.[1] This doctrine corresponds with that of the logicians, in so far as they, after Aristotle, have allowed that the last three figures are only valid as reducible to the first; and, to accomplish this reduction, they have supplied us with a multitude of empirical rules, and lavished a world of ingenuity in rendering the working of these complex rules more easy. From Whately and the common books on Logic, you are of course acquainted with the import of the consonants in the cabalistical verses, *Barbara, Celarent*, etc.;[2] and it must be confessed that, taking these verses on their own ground, there are few human inventions which display a higher ingenuity. Their history is ap-

Latin and Greek mnemonics,—their authors.

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[1] This doctrine of Figure, which is developed in paragraph lxxv., is mainly taken from Kant. See his Essay, *Die Falsche Spitzfindigkeit der vier Syllogistischen Figuren*, 1762. *Werke*, i. p. 55, ed. Rosenkranz and Schubert — Ed.

[2] See *Discussions*, p. 666. — Ed

parently altogether unknown to logicians. They were, in so far as they relate to the three first or Aristotelic figures, the invention of Petrus Hispanus, who died in 1277, Pope John XXII. (or as he is reckoned by some the XXI., and by others the XX.). He was a native of Lisbon. It is curious that the corresponding Greek mnemonics were, so far as I can discover, the invention of his contemporary Nicephorus Blemmidas, who was designated Patriarch of Constantinople.[1] Between them, these two logicians thus divided the two highest places in the Christian hierarchy; but as the one had hardly begun to reign when he was killed by the downfall of his palace,[2] so the other never entered on his office by accepting his nomination at all. The several works of the Pope and the Patriarch were for many centuries the great text-books of Logic, — the one in the schools of the Greek, the other in the schools of the Latin church.

The Greek symbols less ingenious than the Latin.

The Greek symbols are far less ingenious than the Latin, as they only mark the consecution, quantity, and quality of the different propositions of the various moods of the three generally admitted figures, without showing to what mood of the first the moods of the other two figures are to be reduced, far less by what particular process this is to be done. All this is accomplished by the symbols of the Roman Pontiff. As to the relative originality, or the priority in point of date, of these several inventions, I am unable to speak with certainty. It is probable, however, that the Blemmidas was the first, both because his verses are the simpler and ruder, and because it is not known that he was acquainted with the writings of the Western logicians; whereas I find that the *Summulæ* of Hispanus are in a great measure taken, not indeed from the treatise of Blemmidas upon *Dialectic*, but from the *Synopsis of the Organon* of his somewhat earlier contemporary Michael Psellus.[3]

The Rules of logicians for the Reduction of Syllogisms unphilosophical.

But the whole of the rules given by logicians for the Reduction of Syllogisms are unphilosophical, for they are merely the empirical statements of the operation of a principle in detail, which principle itself has been overlooked, but which, when once rationally explicated, supersedes the whole complex apparatus of rules for its mechanical application.

If I succeed, therefore, in explaining to you how the last three

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[1] But see *Discussions*, p. 672. — ED.

[2] See Platina [*Historia de Vitis Pontificum Romanorum*, p. 181, ed. 1572. — ED].

[3] The reverse is probably the truer account; the work which goes by the name of Psellus being in all probability a translation from Hispanus, the mnemonics, with one exception, being omitted. See *Discussions*, p. 128. — ED.

The last three Figures only the mutilated expressions of a complex mental process, and virtually identical with the first.

Figures are only the mutilated expressions of a complex mental process, I shall not only subvert their existence as forms of reasoning not virtually identical with the first figure, — I shall not only relieve you from the necessity of studying the tedious and disgusting rules of their reduction, but in fact vindicate the great principles of reasoning from apparent anomaly. For, in the first place, if the three last figures are admitted as genuine and original forms of reasoning, the principle that all reasoning is the recognition of the relation of a least part to a greatest whole, through a lesser whole or greater part, is invalidated. For, in the three latter figures, the middle term does not really hold the relation of an intermediate whole or part to the subject and predicate of the conclusion; for either, in the second figure, it contains them both, or, in the third, is contained by them both, or, in the fourth, at once contains the greatest whole (that is, the predicate in extensive, the subject in comprehensive, quantity), and is contained by the smallest part (that is, the subject in extensive, the predicate in comprehensive, quantity). In the second place, if these three figures are admitted as independent and legitimate forms, the second general rule I gave you for categorical syllogisms is invalidated in both its clauses. For it will not hold true, that every categorical syllogism must have an universal sumption and an affirmative subsumption. The law of the universal quantity of the sumption is violated in the third figure, by Disamis and Bocardo, in the fourth, by Dimaris; the law of the affirmative quality of the subsumption is violated, in the second figure, by Camestres and Baroco; and, in the fourth, by Camenes. I, therefore, proceed to reconcile all these anomalies by the extinction of the last three figures, as more than accidental modifications of the first, and commence with the following paragraph.

**Par. LXXV. The Second, Third, and Fourth Figures only accidental modifications of the First.**

¶ LXXV. The three last (that is, Second, Third, Fourth) Figures are merely hybrid or mixed reasonings, in which the steps of the process are only partially expressed. The unexpressed steps are, in general, conversive inferences, which we are entitled to make, 1°, From the absolute negation of a first notion as predicated of a second, to the absolute negation of the second notion as predicated of the first — *if no* A *is* B; *then no* B *is* A; 2°, From the total or partial affirmation of a lesser class or notion of a greater, to the partial affirmation of that greater notion of that lesser, — *if all* (or *some*) A *is* B; *then some* B *is* A.

Moods of Second Figure. 1. Cesare.

Taking the figures and moods in their common order; in the Second Figure the first mood is Cesare, of which the formula is:

*No* P *is* M;
*But all* S *are* M;
*Therefore, no* S *is* P.

Here the ostensible or expressed sumption, *No* P *is* M, is mentally converted into the real sumption by the inference, — *Then no* M *is* P. The other propositions follow regularly, — viz.:

*But all* S *are* M;
*Therefore, no* S *is* P.

In reality Celarent.

The real syllogism, fully expressed, is thus:

| | |
|---|---|
| Real Sumption, . . . . | *No* M *is* P; |
| Subsumption, . . . . . | *But all* S *are* M; |
| Conclusion, . . . . . . | *Ergo, no* S *is* P. |

To save time, I shall henceforward state the complementary propositions which constitute the real and proximate parts of the syllogism, by the name of *real*, *proximate*, or *interpolated* sumption, subsumption, or conclusion; and those who take notes may simply mark these, by placing them within brackets. To avoid confusing the conversive inference with the ostensible conclusion of the syllogism, I shall mark the former by the illative conjunction *then;* the latter by the illative conjunction *therefore.* I shall take the concrete examples which I chanced to give in illustration of the various moods. In Cesare the concrete example was:

| | |
|---|---|
| Ostensible Sumption, . . . . . . | *Nothing that is material has free will;* |
| Real, Interpolated, Sumption, . . . . | *(Then nothing that has free will is material;)* |
| Subsumption, . . . . . . . . . . | *But all spirits have free will;* |
| Conclusion, . . . . . . . . . . . . . | *Therefore, no spirit is material.* |

Throwing out of account the ostensible sumption, and considering the syllogism, in its real nature, as actually evolved out of the sumption mentally understood; we have thus, instead of a syllogism in Cesare of the second figure, a syllogism in Celarent of the first. The seeming irregularity is thus reduced to real order.

The second mood of the second figure, viz. Camestres,[1] is rather more irregular, and, therefore, the process of redressing it, though equally easy, is somewhat more complex. The formula is:

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[1] [That Cesare and Camestres are the same syllogism with accidental order of premises, see Zabarella, *Opera Logica*, *De Quarta Figura Syllog.*, p. 111, and authorities cited above, p 296, note.]

2. Camestres.

*All* P *are* M;
*But no* S *is* M;
*Therefore, no* S *is* P.

In reality Celarent.

Here, in the first place, the premises are transposed, for you remember by the second general law of syllogisms, the sumption must in extension be universal, and the subsumption affirmative. By a preliminary operation, their apparent consecution must, therefore, be accommodated to their real. The premises being restored to order, there is yet a further intricacy to unravel. The sumption and the conclusion are neither of them proximate; for we depart from a conversive sumption, and primarily obtain a conclusion which only gives us the ostensible conclusion, in the second instance, through an inference. Thus:

| | |
|---|---|
| Ostensible Sumption, . . . . . . . | *No* S *is* M; |
| Proximate or Real Sumption, . . . | (*Then no* M *is* S;) |
| Subsumption, . . . . . . . . . . | *All* P *are* M; |
| Proximate or Real Conclusion, . . | (*Therefore, no* P *is* S;) |
| Ostensible Conclusion, . . . . . . | *Therefore, no* S *is* P. |

The concrete example given was:

*All colors are visible;*
*But no sound is visible;*
*Therefore, no sound is a color.*

Reversing the premises, we have:

| | |
|---|---|
| Apparent Sumption, . . . . | *No sound is visible;* |
| Proximate or Real Sumption, . | (*Then nothing visible is a sound;*) |
| Subsumption, . . . . . . | *All colors are visible;* |
| Proximate or Real Conclusion, which gives, as a conversive inference, the | (*Therefore, no color is a sound;*) |
| Expressed Conclusion, . . . . | *Then no sound is a color.* |

Thus it is evident that Camestres, in the second figure, is only a modification of Celarent in the first.[1]

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[1] Cf. Krug, *Logik*, § 109, p. 368. Mark Duncan, *Instit. Logicæ*, L. iv. c. 4, p. 229. — Ed. [Derodon, *Logica Restit.*, Pars. iv. p. 648. Reusch, *Systema Logicum*, § 439, p. 613.]

3. Festino.

In reality Ferio.

The third mood of the Second Figure, Festino, presents no difficulty. We have only to interpolate the real sumption, to which the subsumption and conclusion proximately refer. Thus:

| | |
|---|---|
| Expressed Sumption, . . . | *No* P *is* M; |
| Real or Proximate Sumption, | (*Then no* M *is* P); |
| Subsumption, . . . . . . | *But some* S *are* M; |
| Conclusion, . . . . . . . | *Therefore, some* S *are not* P. |

Our concrete example was:

| | |
|---|---|
| Expressed Sumption, . . . | *No vice is laudable;* |
| | *Some actions are laudable;* |
| | *Therefore, some actions are not vices.* |

Here we have only to interpolate, as the real sumption:

*Nothing laudable is a vice.*

Festino, in the second figure, is thus only Ferio in the first, with its sumption converted.

4. Baroco.

Reductio ad impossibile.

The fourth mood, Baroco, is more troublesome. In fact, this mood and Bocardo, in the third figure, have been at once the *cruces* and the *opprobria* of logicians. They have, indeed, succeeded in reducing these to the first figure by what is called the *reductio ad impossibile*, that is, by circuitously showing that if you deny the conclusion in these syllogisms, the contradictory inference is absurd; but as of two contradictories one or other must be true, it, therefore, remains that the original conclusion shall be admitted. This process is awkward and perplexing; it likewise only constrains assent, but does not afford knowledge; while at the same time we have here a syllogism with a negative subsumption, which, if legitimate, invalidates the universality of our second general rule. Now, on the principle I have proposed to you, there is no difficulty whatever in the reduction of this or of any other mood. Here, however, we do not, as in the other moods of the second figure, find that the syllogism proximately departs from an unexpressed sumption, but that the proximate subsumption and the proximate conclusion have been replaced by two derivative propositions. The formula of Baroco is:

In reality Darii

*All* P *are* M;
*But some* S *are not* M;
*Therefore, some* S *are not* P.

But the following is the full mental process :

| | |
|---|---|
| Sumption, . . . . . . . . . . | *All* P *are* M; |
| Real Subsumption, . . . . . . . | (*Some not*-M *are* S;) |
| which gives the<br>Expressed Subsumption, . . . . . | *Then, some* S *are not*-M;<br>Or, *some* S *are not* M; |
| Real Conclusion, . . . . . . | (*Therefore, some not*-P *are* S; |
| which gives the<br>Expressed Conclusion, . . . . . . . | *Then, some* S *are not*-P;<br>Or, *some* S *are not* P. |

Or, to take our concrete example :

*All birds are oviparous ;*
*But some animals are not oviparous ;*
*Therefore, some animals are not birds.*

Of this the explicated process will stand as follows :

| | |
|---|---|
| Sumption, . . . . . . . . . . . . | *All birds are oviparous ;* |
| Real subsumption, . . . . . . . . | (*Some things not oviparous are animals ;*) |
| which gives the<br>Expressed Subsumption, . . . . . . | *Then, some animals are not-oviparous ;*<br>Or, *are not oviparous ;* |
| Real or Proximate Conclusion, . . . . | (*Therefore, some things not birds are animals ;*) |
| which gives the<br>Expressed Conclusion, . . . . . . . | *Then, some animals are not-birds ;*<br>Or, *are not birds.* |

Now, in this analysis of the process in Baroco, we not only resolve the whole problem in a direct and natural and instructive way; but we get rid of the exception which Baroco apparently affords to the general rule, that the subsumption of a categorical must be affirmative. Here you see how the real subsumption is affirmative, and how, from having a negative determination in its subject, it by conversion assumes the appearance of a negative proposition, the affirmative proposition — *some things not-birds are animals*, being legitimately converted, first into — *some animals are not-birds*, and this again being legitimately converted into — *some animals are not birds.* You recollect that, in the doctrine of Propositions,[1] I showed you how every affirmative proposition could be adequately expressed in a negative, and every negative in an affirmative form ; and the utility of that observation you now see, as it enables us simply to solve the problem of the reduction of Baroco, and, as we shall also see, of Bocardo. Baroco is thus directly reduced to Darii of the first figure, and not, as by the indirect process of logicians in general, to Barbara.[1] On this doctrine the name Baroco is also improper, and another, expressive of its genuine affinity, should be imposed.

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[1] See above, p. 178. — Ed.

Third Figure

We proceed now to the Third Figure. You will observe that, as in the Second Figure, with the exception of Baroco, it was the sumption of the two premises which was affected by the conversion, so in the third it is the subsumption. For in Camestres of the second, and in Disamis and Bocardo of the third, figure, the premises are transposed. This understood subsumption is a conversive inference from the expressed one, and it is the proximate antecedent from which the real conclusion is immediately inferred.

1. Darapti.
In reality Darii.

In the first mood of this figure, Darapti, the subsumption is a universal affirmative; its conversion is, therefore, into a particular affirmative. Its formula is —

Sumption, . . . . . . . *All* M *are* P;
Expressed Subsumption, . . . *But all* M *are* S;
which gives the
Really Proximate Subsumption, . (*Then some* S *are* M;)
from which directly flows
The Conclusion, . . . . . . *Therefore, some* S *are* P.

---

[1] There seems to be an error in the text here. The syllogism, as finally reduced, is not in Darii, nor in any legitimate mood; and its natural reduction, according to the method adopted by the Author, is not to Darii, but to Ferio, by means of an unexpressed sumption. Thus —

*All* P *are* M;
*Then no not*-M *are* P;
*Some* S *are not*-M;
*Therefore, some* S *are not* P.

This is the method adopted by the following logicians, referred to by the Author in his Common-Place Book, viz.: — Noldius, who calls Baroco, Facrono, *Logica Recognita*, cap. xii. § 12, p. 300, 1666; Reusch (who follows Noldius), *Systema Logicum*, § 539. p. 611, 2d ed., 1741; Wolf. *Phil. Rationalis*, § 384; Bachmann, *Logik*, § 133, Anm., i. p. 224. Before any of the above-mentioned writers, Mark Duncan gives the reduction of Camestres to Celarent, and of Baroco to Ferio, by counterposition. He adds, with special reference to the reduction of Baroco to Ferio by this method, — "Hanc reductionis speciem existimo a scholasticis perspectam fuisse: sed despectam; quia in prima figura propositio minor affirmans attributi infiniti, quum primo intuitu videatur esse negans, formæ evidentiam obscurat: atqui syllogismorum reductio comparata est non ad formæ bonitatem obscurandam, sed illustrandam." *Institutiones Logicæ*, L. iv. c. 3, § 4, p. 230 Salmurii, 1612

The syllogism of the text may also be exhibited more circuitously, as Darii, by retaining the affirmative quality in the converted proposition. Thus: —

*All not*-M *are not*-P;
*Some* S *are not* M;
*Therefore, some* S *are not*-P.

This is the method of reduction employed by Derodon, who, in the same way, would reduce Camestres to Barbara, *Logica Restituta* P. iv. tract. i. c 2, art. 6, p. 648. The error here noticed seems to have originated in a momentary confusion of the reduction of Baroco with that of Bocardo; which, however, could not be rectified without greater alterations in the text than the Editors consider themselves justified in making — ED

Our concrete example was —

Sumption, . . . . . . . . . . . . . *All gilding is metallic;*
Expressed Subsumption, . . . . . . . *But all gilding shines;*
which gives, as a conversion, the
Real Subsumption, . . . . . . . . . *Then, some things that shine are gilding;*
and from this last immediately proceeds the
Conclusion, . . . . . . . . . . . . *Therefore, some things that shine are metallic.*

Thus Darapti, in the third figure, is nothing but a one-sided derivative of Darii in the first.[1]

2. Felapton.

The second mood of the Third Figure is Felapton. Its formula —

Sumption, . . . . . . . *No* M *is* P;
Expressed Sumption, . . . . *All* M *are* S;
The Real Subsumption, . . . (*Then, some* S *are* M;)
from which
The Conclusion, . . . . . *Therefore, some* S *are not* P.

Our example was —

Sumption, . . . . . . . . . . . . . *Nothing material is a free agent;*
Expressed Subsumption, . . . . . . . *But everything material is extended;*
Of which the Real Subsumption is the converse, . . . . . . . . . . . } (*Then, something extended is material;*)
From which the Conclusion, . . . . . } *Therefore, something extended is not a free agent.*

Felapton, in the third Figure, is thus only a modification of Ferio in the first.

3. Disamis.

The third mood in this figure is Disamis. Its formula —

*Some* M *are* P;
*But all* M *are* S;
*Therefore, some* S *are* P.

In reality Darii.

Here the premises are transposed. Their order being rectified:

Sumption, . . . . . . . . . . . . . *All* M *are* S;
Expressed Subsumption, . . . . . . . *But some* M *are* P;

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[1] [Reusch, *Systema Logicum*, § 539, p. 614.]

| | |
|---|---|
| Which, by conversive inference, gives the Proximate Subsumption, | (*Then, some* P *are* M;) |
| From which proceeds the Real Conclusion, | (*Therefore, some* P *are* S;) |
| Which, by conversion, gives the Expressed Conclusion, | *Then, some* S *are* P. |

Our example was (the reversal of the premises being rectified):

| | |
|---|---|
| Sumption, | *All acts of homicide are cruel;* |
| Expressed Subsumption, | *But some acts of homicide are laudable;* |
| Which gives, as a conversive inference, the Proximate Subsumption, | (*Then, some laudable acts are acts of homicide;*) |
| From this Proximate Conclusion, | (*Therefore, some laudable acts are cruel;*) |
| Which again gives, as its converse, the Expressed Conclusion, | *Therefore, some cruel acts are laudable.* |

Thus Disamis in the third is only Darii in the first figure.

4. Datisi.
In reality Darii.

The fourth mood of the Third Figure is Datisi, which is only Disamis, the premises not being reversed, and the conclusion not a conversive inference. It requires, therefore, only to interpolate the proximate subsumption. Thus:

| | |
|---|---|
| Sumption, | *All* M *are* P; |
| Expressed Subsumption, | *But some* M *are* S; |
| Giving by conversion, | (*Then, some* S *are* M;) |
| From which last the Conclusion, | *Therefore, some* S *are* P. |

| | |
|---|---|
| Sumption, | *All acts of homicide are cruel,* |
| Expressed Subsumption, | *But some acts of homicide are laudable;* |
| Which gives, by conversion, the Proximate Subsumption, | (*Then, some laudable acts are acts of homicide;*) |
| From which the Conclusion, | *Therefore, some laudable acts are cruel.* |

Thus, Datisi likewise is only a distorted Darii.

5. Bocardo.

The fifth mood of the Third Figure is the famous mood Bocardo, which, as I have mentioned, with Baroco, but far more than Baroco, was the opprobrium of the scholastic system of reduction. So intricate, in fact, was this mood considered, that it was looked upon as a trap, into which if you once got, it was no easy matter to find an exit. Bocardo was, during the middle ages, the name given in Oxford to the Academical Jail or Carcer — a name which still remains as a relique of the ancient logical glory of that venerable seminary. Rejecting, then, the perplexed and unsatisfactory reduction by the logicians of Bocardo to Barbara by an apagogical exposition, I commence by stating, that Bocardo is only Disamis under the form of a negative affirmative; its premises, therefore, are transposed. Removing the transposition, its formula is —

*All* M *are* S;
*But some* M *are not* P;
*Therefore, some* S *are not* P;

which is thus explicated, like Baroco —

| | |
|---|---|
| Sumption, . . . . . . . . . . . . | *All* M *are* S; |
| Expressed Subsumption, . . . . . . | *Some* M *are not* P; |
| Which gives, by conversive inference, . | ( *Then, some not-*P *are* M;) |
| From this Real Subsumption proceeds the Proximate Conclusion, . . . . | ( *Therefore, some not-*P *are* S;) |
| Which again gives, by conversion, the Expressed Conclusion, . . . . . . | *Then, some* S *are not-*P; |
| Whence again, . . . . . . . . . . . | *Some* S *are not* P; |

Our concrete example was — the order of the premises being redressed:

| | |
|---|---|
| Sumption, . . . . . . . . . . . . | *All syllogisms are important;* |
| Expressed Subsumption, . . . . . . | *But some syllogisms are not regular;* |
| From which, by conversive inference, . . | ( *Then, some things not regular are syllogisms;*) |
| And from this Proximate Subsumption proceeds the Proximate Conclusion, . | *Therefore, some things not regular are important;* |
| From whence, by conversion, the Expressed Conclusion, . . . . . . . | *Then, some important things are not-regular,* |
| Whence, . . . . . . . . . . . . . . | *Whence, some important things are not regular.* |

Bocardo is thus only a perverted and perplexed Darii.[1]

6 Ferison.
In reality Ferio.

The last mood of the Third Figure is Ferison, which is without difficulty — it only being required to interpolate the real subsumption, from which the conclusion is derived. Its formula is —

| | |
|---|---|
| Sumption, . . . . . . . . . . . . | *No* M *is* P; |
| Expressed Subsumption, . . . . . . | *But some* M *are* S; |

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[1] [See Noldius, *Log. Rec.* c. xii. § 12, p. 301. Bocardo is called Docamroc by Noldius. Cf Reusch, *Syst. Log.*, § 539, p. 611.]

| | |
|---|---|
| Which gives, by conversive inference, the Subsumption, . . . . . . . . . | *Then, some* S *are* M; |
| From which immediately flows the Conclusion, . . . . . . . . . . . | *Therefore, some* S *are not* P. |

| | |
|---|---|
| Sumption, . . . . . . . . . . . | *No truth is without result;* |
| Expressed Subsumption, . . . . . . | *But some truths are misunderstood;* |
| The Conversive Inference from which is, | *Then some things misunderstood are truths;* |
| And from this Implied Subsumption immediately proceeds the Conclusion, . | *Therefore, some things misunderstood are not without result.* |

Fourth Figure.

Ferison[1] is thus only Ferio, fringed with an accident of conversion.

The Fourth Figure is distinguished from the two former in this — that in the Second and Third Figures one or other, but only one or other, of the premises requires the interpolation of the mental inference; whereas, in the Fourth Figure, either both the premises require this, or neither, but only the conclusion. The three first moods (Bamalip, Calemes, Dimatis) need no conversion of the premises; the two last, Fesapo and Fresison, require the conversion of both.

The First Figure the only simple and independent form of reasoning.

The result of the foregoing discussion is thus accordingly that, in rigid truth, there is no figure entitled to the dignity of a simple and independent form of reasoning, except that which has improperly been termed the First; the three latter figures being only imperfect or elliptical expressions of a complex process of inference, which, when fully enounced, is manifestly only a reasoning in the first figure. There is thus but one figure, or, more properly, but one process of categorical reasoning; for the term *figure* is abusively applied to that which is of a character regular, simple, and essential.

Figure of Hypothetical, Disjunctive, and Hypothetico-Disjunctive Syllogisms

Having, therefore, concluded the treatment of figure in respect of Categorical Syllogisms, it remains to consider how far the other species of Simple Syllogisms — the hypothetical, the disjunctive, and the hypothetico-disjunctive — are subject to this accident of form. In regard to the Hypothetical Syllogism, this kind of reasoning is not liable to the affection of figure. It is true indeed that we may construct a syllogism of three hypothetical propositions, which shall be susceptible of all the figures incident to a categorical reasoning; but this is itself in fact only a categorical syllogism hypothetically expressed. For example:

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[1] [Scotus says that Ferison, Bocardo, and Felapton, are useless. as concluding indirectly *Quæstiones, In Anal. Prior.*, L. i. q. 24 ]

*If* A *is, then* B *is;*
*But if* S *is, then* A *is;*
*Therefore, if* S *is, then* B *is.*

This syllogism may certainly be varied through all the figures, but it is not an hypothetical syllogism, in the proper signification of the term, but manifestly only a categorical; and those logicians who have hence concluded, that a hypothetical reasoning was exposed to the schematic modifications of the categorical, have only shown that they did not know how to discriminate these two forms by their essential differences.

In regard to the Disjunctive Syllogism the case is different; for as the disjunctive judgment is in one point of view only a categorical judgment, whose predicate consists of logically opposing members, it is certainly true that we can draw a disjunctive syllogism in all the four figures.

I shall use the letters P, M, and S; but as the disjunction requires at least one additional letter, I shall, where that is necessary, take the one immediately following.

FIGURE I.

M *is either* P *or* Q;
S *is* M;
*Therefore,* S *is either* P *or* Q.

FIGURE II.

First case—

P *is either* M *or* N;
S *is neither* M *nor* N;
*Therefore,* S *is not* P.

Second case—

P *is neither* M *nor* N;
S *is either* M *or* N;
*Therefore,* S *is not* P.

FIGURE III.

M *is either* P *or* Q;
M *is* S;
*Therefore, some* S *is either* P *or* Q.

FIGURE IV.

First case —

P *is either* M *or* N;
*Both* M *and* N *are* S;
*Therefore, some* S *is* P.

Second case —

P *is either* M *or* N;
*Neither* M *nor* N *is* S;
*Therefore,* S *is not* P.[1]

Figure of Composite Syllogisms.

Of Composite Syllogisms — I need say nothing concerning the Epicheirema, which, it is manifest, may be in one figure equally as another. But it is less evident that the Sorites may be of any figure; and logicians seem, in fact, from their definitions, to have only contemplated its possibility in the first figure. It is, however, capable of all the four schematic accidents by a little contortion; but as this at best constitutes only a logical curiosity, it is needless to spend any time in its demonstration.[2]

So much for the Form of reasoning, both Essential and Accidental, and the Divisions of Syllogisms which are founded thereon.

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[1] See Chr. J Braniss, *Grundriss der Logik*, § 394, p. 146. Compare Krug, *Logik*, p. 387 *et seq.*

[2] For a complicated theory of Sorites in different figures, see Herbart, *Lehrbuch zur Einleitung in die Philosophie*, § 70. Drobisch. *Neue Darstellung der Logik*, §§ 80—84. — ED.

# LECTURE XXIII.

## STOICHEIOLOGY.

## SECTION II.—OF THE PRODUCTS OF THOUGHT

### III.—DOCTRINE OF REASONINGS.

### SYLLOGISMS.—THEIR DIVISIONS ACCORDING TO VALIDITY.

### FALLACIES.

All the varieties of Syllogism, whose necessary laws and contingent modifications we have hitherto considered, are, taken together, divided into classes by reference to their Validity; and I shall comprise the heads of what I shall afterwards illustrate, in the following paragraph.

Par. LXXVI. Syllogisms,—Correct and Incorrect.

¶ LXXVI. Syllogisms, by another distribution, are distinguished, by respect to their Validity, into *Correct* or *True*, and *Incorrect* or *False*. The Incorrect or False are again (though not in a logical point of view) divided, by reference to the intention of the reasoner, into *Paralogisms*, *Faulty*, and into *Sophisms*, or *Deceptive*, *Reasonings*. The Paralogism (*paralogismus*) is properly a syllogism of whose falsehood the employer is not himself conscious; the Sophism (*sophisma*, *captio*, *cavillatio*) is properly a false syllogism, fabricated and employed for the purpose of deceiving others. The term *Fallacy* may be applied indifferently in either sense. These distinctions are, however, frequently confounded; nor in a logical relation are they of account. False Syllogisms are, again, vicious, either in respect of their form or of their matter, or in respect of both form and matter.[1]

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[1] Krug, *Logik*, § 115.—Ed.

Explication.
Logical and absolute truth discriminated.

In regard to the first distinction contained in this paragraph, — of Syllogisms into Correct or True and Incorrect or False, — it is requisite to say a few words. It is necessary to distinguish logical truth, that is, the truth which Logic guarantees in a reasoning, from the absolute truth of the several judgments of which a reasoning is composed. I have frequently inculcated on you that Logic does not warrant the truth of its premises, except in so far as these may be the formal conclusions of anterior reasonings, — it only warrants (on the hypothesis that the premises are truly assumed) the truth of the inference. In this view the conclusion may, as a separate proposition, be true, but if this truth be not a necessary consequence from the premises, it is a false conclusion, that is, in fact, no conclusion at all. Now, on this point there is a doctrine prevalent among logicians, which is not only erroneous, but, if admitted, is subversive of the distinction of Logic as a purely formal science. The doctrine in question is in its result this, — that if the conclusion of a syllogism be true, the premises may be either true or false, but that if the conclusion be false, one or both of the premises must be false; in other words, that it is possible to infer true from false, but not false from true. As an example of this I have seen given the following syllogism:

*Aristotle is a Roman;*
*A Roman is a European:*
*Therefore, Aristotle is a European.*

The inference, in so far as expressed, is true; but I would remark that the whole inference which the premises necessitate, and which the conclusion, therefore, virtually contains, is not true, — is false. For the premises of the preceding syllogism gave not only the conclusion, *Aristotle is a European*, but also the conclusion, *Aristotle is not a Greek;* for it not merely follows from the premises that Aristotle is conceived under the universal notion of which the concept *Roman* forms a particular sphere, but likewise that he is conceived as excluded from all the other particular spheres which are contained under that universal notion. The consideration of the truth of the premise, *Aristotle is a Roman*, is, however, more properly to be regarded as extralogical; but if so, then the consideration of the conclusion, *Aristotle is a European*, on any other view than a mere formal inference from certain given antecedents, is, likewise, extralogical. Logic is only concerned with the formal truth — the technical validity — of its syllogisms, and anything beyond the legitimacy of the consequence it draws from certain hypothetical antecedents, it does not profess to vindicate. Logical truth and falsehood are thus contained in the correctness and incorrectness of logical inference; and it was, therefore, with no impropriety that we made a true or correct, and a false or incorrect syllogism convertible expressions.[1]

The distinction of Incorrect Syllogisms into Paralogisms and Sophisms, not of logical import.

In regard to the distinction of Incorrect Syllogisms into Paralogisms and Sophisms, nothing need be said. The mere statement is sufficiently manifest; and, at the same time, it is not of a logical import. For logic does not regard the intention with which reasonings are employed, but considers exclusively their internal legitimacy. But while the distinction is one, in other respects, proper to be noticed, it must be owned that it is not altogether without a logical value. For it behooves us to discriminate those artificial sophisms, the criticism of which requires a certain acquaintance with logical forms, and which, as a play of ingenuity and an exercise of acuteness, are not without their interest, from those paralogisms which, though not so artificial, are on that account only the more frequent causes of error and delusion.

Formal and material Fallacies.

The last distinction is, however, logically more important, viz., 1°, Of reasonings into such as are materially fallacious, that is, through the object-matter of their propositions; 2°, Into such as are formally fallacious, that is, through the manner or form in which these propositions are connected; and, 3°, Into such as are at once materially and formally fallacious. Material Fallacies lie beyond the jurisdiction of Logic. Formal Fallacies can only be judged of by an application of those rules, in the exposition of which we have hitherto been engaged.

Ancient Greek Sophisms.

The application of these rules will afford the opportunity of adducing and resolving some of the more capital of those Sophisms, which owe their origin to the ingenuity of the ancient Greeks. "Many of these sophisms appear to us in the light of a mere play of wit and acuteness, and we are left to marvel at the interest which they originally excited, — at the celebrity which they obtained, and at the importance attached to them by some of the most distinguished thinkers of antiquity. The marvel will, however, be in some degree abated, if we take the following circumstances into consideration.

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[1] Cf. Esser, *Logik*, § 109. — Ed.

"In the first place, in the earlier ages of Greece, the method of science was in its infancy, and the laws of thought were not yet investigated with the accuracy and minuteness requisite to render the detection of these fallacies a very easy matter. Howbeit, therefore, men had an obscure consciousness of their fallacy, they could not at once point out the place in which the error lay; they were thus taken aback, confounded, and constrained to silence.

"In the second place, the treatment of scientific subjects was more oral and social than with us; and the form of instruction principally that of dialogue and conversation. In antiquity, men did not isolate themselves so much in the retirement of their homes; and they read far less than is now necessary in the modern world; consequently, with those who had a taste for science, the necessity of social communication was greater and more urgent. In their converse on matters of scientific interest, acuteness and profundity were, perhaps, less conducive to distinction than vivacity, wit, dexterity in questioning, and in the discovery of objections, self-possession, and a confident and uncompromising defence of bold, half-true, or even erroneous assertions. Through such means, a very superficial intellect can frequently, even with us, puzzle and put to silence another far acuter and more profound. But, among the Greeks, the Sophists and Megaric philosophers were accomplished masters in these arts.

"In the third place, as we know from Aristotle and Diogenes Laertius,[1] it was the rule in their dialogical disputations, that every question behooved to be answered by a yes or a no, and thus the interrogator had it in his power to constrain his adversary always to move in a foreseen, and, consequently, a determinate direction. Thus the Sophisms were somewhat similar to a game of forfeits, or like the passes of a conjurer, which amuse and astonish for a little, but the marvel of which vanishes the moment we understand the principle on which they are performed."[2]

As the various fallacies arise from secret violation of the logical laws by which the different classes of syllogisms are governed, and as syllogisms are Categorical, or Hypothetical, or Disjunctive, or Hypothetico-disjunctive, we may properly consider Fallacies under these four heads, and as transgressions of the syllogistic laws in their special application to these several kinds of syllogism.

> ¶ LXXVII. The Syllogistic Laws determine, in reference to all the classes of Syllogism, the three following principles; and

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[1] Arist. *Soph. Elench.*, c. 17. Laertius, L. ii. c. 18, § 135. The references are given by Bachmann. — Ed.

[2] Bachmann, *Logik*, § 384, p. 513.

all Fallacies are violations of one or other of these principles, in relation to one or other class of syllogism.

Par. LXXVII. Fallacies,—their division and classification.

I. If both the Logical Form and the Matter of a syllogism be correct, then is the Conclusion true.

II. If the syllogism be Materially Correct, but Formally Incorrect, then the Conclusion is not (or only accidentally) true.

III. If the syllogism be Formally Correct, but Materially Incorrect, then the Conclusion is not (or only accidentally) true.

Fallacies, as violations of these principles in more immediate reference to one or other of the Four Classes of Syllogism, must again be vicious in reference either to the form, or to the matter, or to both the form and matter of a syllogism. Fallacies are thus again divided into *Formal* and *Material*, under which classes we shall primarily arrange them.

Par. LXXVIII. Formal Fallacies Categorical.

¶ LXXVIII. Of Formal Fallacies, the Categorical are the most frequent, and of these, those whose vice lies in having four in place of three terms (*quaternione terminorum*); for this, in consequence of the ambiguity of its expression, does not immediately betray itself. Under this genus are comprised three species, which are severally known under the names of, 1°, *Fallacia sensus compositi et divisi;* 2°, *Fallacia a dicto secundum quid ad dictum simpliciter, et vice versa;* 3°, *Fallacia figuræ dictionis.*

Explication. Fallacies arising from a *Quaternio Terminorum.*

"That in a categorical syllogism only three terms are admissible, has been already shown. A categorical syllogism, with four capital notions, has no connection; and is called, by way of jest, the *logical quadruped* (*animal quadrupes logicum*). This vice usually occurs when the notions are in reality different, but when their difference is cloaked by the verbal identity of the terms; for, otherwise, it would be too transparent to deceive either the reasoner himself or any one else. This vice, may, however, be of various kinds, and of these there are, as stated, three principal species."

"The first is the *Fallacia sensus compositi et divisi,*—the *Fallacy of Composition and Division.*[1] This arises when, in the same

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[1] [See Fonseca *Instit. Dial*, L. viii. c. v p. 106, Ingolstadii, 1604.]

1. *Fallacia sensus compositi et divisi.*

Modes of this Fallacy.

syllogism, we employ words now collectively, now distributively, so that what is true in connection, we infer must be also true in separation, and *vice versa;* as, for example: — *All must sin; Caius sins; therefore, Caius must sin.*"[1] Here we argue, from the unavoidable liability in man to sin, that this particular sin is necessary, and for this individual sinner. "This fallacy may arise in different ways. 1°, It may arise when the predicate is joined with the subject in a simple and in a modal relation, for example: *White can be* (*i. e. become*) *black, therefore white can be black.* 2°, It may arise from the confusion of a copulative and disjunctive combination. Thus 9 *consists or is made up of* 7 + 2, *which are odd and even numbers, therefore* 9 *is odd and even.* 3°, It may arise, if words connected in the premises are disjoined in the conclusion. Thus: *Socrates is dead, therefore Socrates is.*"[2]

An example of the first of these contingencies — that which is the most frequent and dangerous — occurs when, from its universality, a proposition must be interpreted with restriction. Thus, when our Saviour says, — *The blind shall see,* — *The deaf shall hear,* — he does not mean that the blind, as blind, shall see, — that the deaf, as deaf, shall hear, but only that those who had been blind and deaf should recover the use of these senses. To argue the opposite would be to incur the fallacy in question.

2. *Fallacia a dicto secundum quid ad dictum simpliciter*, and its converse.

The second fallacy is that *A dicto secundum quid ad dictum simpliciter*, and its converse, *A dicto simpliciter ad dictum secundum quid.* The former of these — the fallacy *A dicto secundum quid ad dictum simpliciter* — arises when, from what is true only under certain modifications and relations, we infer it to be true absolutely. Thus, if, from the fact that some Catholics hold the infallibility of the Pope, we should conclude that the infallibility of the Pope is a tenet of the Catholic Church in general. The latter — the fallacy *a dicto simpliciter ad dictum secundum quid* — is the opposite sophism, where from what is true absolutely we conclude what is true only in certain modifications and relations, as, for example, when from the premise that *Man is a*

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[1] Krug, *Logik*, § 116, p. 420. — Ed. [On the distinction of *Sensus Compositi et Divisi*, so famous in the question of foreknowledge and liberty, see its history in Ruiz, *Commentarii ac Disputationes, de Scientia, de Ideis, de Veritate, ac de Vita Dei*, Disp. xxxiii. p. 261 *et seq.* Alvarez. in Gale, *Philosophia Generalis*, L. iii c. iii. sect. 2, § 8, p. 466.]

[2] [Denzinger,] [*Die Logik als Wissenschaft der Denkkunst, dargestellt*, § 558, Bamberg, 1836. — Ed.]

*living organism*, we infer that *A painted or sculptured man is a living organism.*[1]

The third fallacy — the *Sophisma figuræ dictionis* — arises when we merely play with the ambiguity of a word. The well-known syllogism, *Mus syllaba est; Mus caseum rodit; Ergo, syllaba caseum rodit*,[2] is an example; or,

*Herod is a fox;*
*A fox is a quadruped;*
*Therefore, Herod is a quadruped.*

To this fallacy may be reduced what are called the *Sophisma equivocationis*, the *Sophisma amphiboliæ*, and the *Sophisma accentus*,[3] which are only contemptible modifications of this contemptible fallacy.

Par. LXXIX. Material Fallacies.

¶ LXXIX. Of Material Fallacies, those are of the most frequent occurrence, where, from a premise which is not in reality universal, we conclude universally; or from a notion which is not in reality a middle term, we infer a conclusion. Under this genus there are various species of fallacies, of which the most remarkable are, 1°, the *Sophisma cum hoc* (*vel post hoc*), *ergo propter hoc;* 2°, *Sophisma pigrum*, or *ignava ratio;* 3°, *Sophisma polyzeteseos;* and 4°, *Sophisma heterozeteseos.*[4]

Explication. Fallacies of an Unreal Universality, and of an Illusive Reason.

In this paragraph you will observe that there are given two genera of Material Fallacies, — those of an Unreal Universality (*sophismata fictæ universalitatis*), and those of an Illusive Reason (*sophismata falsi medii*, — or *non causæ ut causæ*). I must first explain the nature of these, considered apart, then show that they both fall together, the one being only the categorical, the other only the hypothetical, expression of the same vice; and, finally, consider the various species into which the generic fallacy is subdivided.

1 Of an Unreal Universality.

"Our decisions concerning individual objects, in so far as they belong to certain classes, are very frequently fallacies of the former kind; that is, conclusions from premises of an unreal universality. For example: — *The Jews are rogues*, — *The Carthaginians, faith-*

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[1] Cf. Denzinger, *Logik*, § 564. — ED.

[2] Seneca, *Epist.*, 48. — ED.

[3] On these fallacies, see Denzinger, *Logik*, §§ 559, 560, 561. — ED.

[4] Cf. Krug, *Logik*, § 117. — ED.

*less,* — *The Cretans, liars,* — *The French, bragadocios,* — *The Germans, mystics,* — *The rich, purse-proud,* — *The noble, haughty,* — *Women, frivolous,* — *The learned, pedants.* — These and similar judgments, which in general are true only of many, — at best only of the majority, of the subjects of a class, often constitute, however, the grounds of the opinions we form of individuals; so that these opinions, with their grounds, when expressed as conclusion and premises, are nothing else than fallacies of an unreal generality, — *sophismata fictæ universalitatis.* It is impossible, however, to decide by logical rules whether a proposition, such as those above stated, is or is not universally valid; in this, experience alone can instruct us. Logic requires only, in general, that every sumption should be universally valid, and leaves it to the several sciences to pronounce whether this or that particular sumption does or does not fulfil this indispensable condition."[1] The *sophisma fictæ universalitatis* is thus a fallacious syllogism of the class of categoricals.

2 Of Unreal Middle

But the second kind of material fallacies, the sophisms of Unreal Middle, are not less frequent than those of unreal universality. When, for example, it is argued (as was done by ancient philosophers) that the magnet is animated, because it moves another body, or that the stars are animated, because they move themselves; — here there is assumed not a true, but merely an apparent, reason; there is, consequently, no real mediation, and the *sophisma falsi medii* is committed. For, in these cases, the conclusion in the one depends on the sumption, — *If a body moves another body, it is animated;* in the other, on the sumption, — *If a body moves itself, it is animated;* but as the antecedent and consequent in neither of these sumptions are really connected as reason and consequent, — or as cause and effect, — there is, therefore, no valid inference of the conclusion.[2] The *sophisma non causæ ut causæ* is thus an hypothetical syllogism; but, as it may be categorically enounced, this fallacy of unreal reason will coincide with the categorical fallacy of unreal universality. Thus, the second example above alleged:

The fallacies of Unreal Reason and of Unreal Universality coincide

*If the stars move themselves, they are animated;*
*But the stars do move themselves;*
*Therefore, the stars are animated:* —

is thus expressed by a categorical equivalent —

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[1] Krug, *Logik*, § 117. Anm., p. 422. — Ed.

[2] Cf. Krug, *Logik*, p. 423. — Ed.

*All bodies that move themselves are animated;*
*But the stars move themselves;*
*Therefore, the stars are animated.*

In the one case, the sumption ostensibly contains the subsumption and conclusion, as the correlative parts of a causal whole; in the other, as the correlative parts of an extensive whole, or, had the categorical syllogism been so cast, of an intensive whole. The two genera of sophisms may, therefore, it is evident, be considered as one, — taking, however, in their particular manifestation, either a categorical or an hypothetical form.

Fallacy of Unreal Reason as dangerous in its negative as in its positive form.

I may notice that the sophism of Unreal Generality, or Unreal Reason, is hardly more dangerous in its positive than in its negative relation. For we are not more disposed lightly to assume as absolutely universal what is universal in relation to our experience, than lightly to deny as real what comes as an exception to our factitious general law. Thus it is that men having once generalized their knowledge into a compact system of laws, are found uniformly to deny the reality of all phenomena which cannot be comprehended under these. They not only pronounce the laws they have generalized as veritable laws of nature, which, haply, they may be, but they pronounce that there are no higher laws; so that all which does not at once find its place within their systems, they scout, without examination, as visionary and fictitious. So much for this ground of fallacy in general; we now proceed to the species.

Species of the fallacy of Unreal Reason.

Now, as unreal reasons may be conceived infinite in number, the minor species of this class of sophisms cannot be enumerated; I shall, therefore, only take notice of the more remarkable, and which, in consequence of their greater notoriety, have been honored with distinctive appellations.

(a) *Sophisma cum hoc (vel post hoc), ergo propter hoc.*

Of these, the first is the *Sophisma cum hoc* (*vel post hoc*), *ergo propter hoc*. This fallacy arises when, from the contingent consecution of certain phenomena in the order of time, we infer their mutual dependence as cause and effect. When, for example, among the ancient Romans, a general, without carefully consulting the augurs, engaged the enemy, and suffered a defeat, it was inferred that the cause of the disaster was the unfavorable character of the auspices. In like manner, to this sophism belongs the conclusion, so long prevalent in the world, that the appearance of a comet was the harbinger of famine, pestilence and war. In fact, the greater number of the hypotheses which constitute the history of physics and philosophy, are only so many examples of this fallacy. But no science has exhibited, and exhibits, so many flagrant instances of the sophism *cum hoc, ergo propter hoc*, as that of medicine; for, in proportion as the connection of cause and effect is peculiarly obscure in physic, physicians have only been the bolder in assuming that the recoveries which followed after their doses, were not concomitants, but effects. This sophism is, in practice, of great influence and very frequent occurrence; it is, however, in theory, too perspicuous to require illustration.

(b) *Ignava Ratio.*

The second fallacy is that which has obtained the name of *Ignava ratio*, or *Sophisma pigrum*, — in Greek, ἀργὸς λόγος.[1] The excogitation of this argument is commonly attributed to the Stoics, by whom it was employed as subsidiary to their doctrine of fate. "It is an argument by which a man endeavors to vindicate his inactivity in some particular relation, by the necessity of the consequence.

Example.

It is an hypothetico-disjunctive syllogism, and, when fully expressed, is as follows:

Sumption. . . . . . . *If I ought to exert myself to effect a certain event, this event either must take place or it must not;*
Subsumption . . . . *If it must take place, my exertion is superfluous; if it must not take place, my exertion is of no avail;*
Conclusion. . . . . . *Therefore, on either alternative, my exertion is useless.*"[2]

Cicero, in the twelfth chapter of his book, *De Fato*, thus states it:

*If it be fated that you recover from your present disease, whether you call in a doctor or not, you will recover; again, if it be fated that you do not recover from your present disease, whether you call in a doctor or not, you will not recover;*
*But one or other of the contradictories is fated;*
*Therefore, to call in a doctor is of no consequence.*

Others have enounced the sumption in various forms, for example: *If it be impossible but that you recover from the present disease*, etc., — or — *If it be true that you will recover from this disease*, — or — *If it be decreed by God that you will not die of this disease*, and so likewise in different manners; according to which likewise the question itself has obtained various titles, as *Argument*

Its various designations.

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[1] See Menage on Diogenes Laertius, L. ii. Gassendi, *Opera*, t. i. *De Log. Orig. et Var.*, L p. 123. — Ed. [Facciolati, *Acroasis*, v. p. 55. i. c. 6, p 51.]

[2] Krug, *Logik*, § 117, p. 424. — Ed.

*De Fato—De Possibilibus—De Libero Arbitrio—De Providentia—De Divinis Decretis—De Futuris Contingentibus—De Physica Prædeterminatione*, etc. No controversy is more ancient, none more universal, none has more keenly agitated the minds of men, none has excited a greater influence upon religion and morals; it has not only divided schools, but nations, and has so modified not only their opinions, but their practice, that whilst the Turks, as converts to the doctrine of Fate, take not the slightest precaution in the midst of pestilence, other nations, on the contrary, who admit the contingency of second causes, carry their precautionary policy to an opposite excess.

Its history.

The common doctrine, that this argument is an invention of the Stoics, and a ground on which they rested their doctrine of the physical necessitation of human action, is, however, erroneous, if we may accord credit to the testimony of Diogenes Laertius, who relates, in the Life of Zeno, the founder of this sect, that he bestowed a sum of two hundred minæ on a certain dialectician, from whom he had learned seven species of the argument called the λόγος θερίζων, *metens*, or *reaper*, which differs little, if at all, from the *ignava ratio*.[1] For how this sophism is constructed, and with what intent, I find recorded in the commentary of Ammonius on the book of Aristotle Περὶ Ἑρμηνείας.[2] Of the same character, likewise, is the argument called the λόγος κυριεύων, the *ratio dominans*, or *controlling reason*, the process of which Arrian describes under the nineteenth chapter of the second book of the sayings of Epictetus.[3] *The lazy reason,—the reaper,*—and *the controlling reason*, are thus only various names for the same process.

The vice of this sophism.

In regard to the vice of this sophism, "it is manifest that it lies in the sumption, in which the disjunct members are imperfectly enounced. It ought to have been thus conceived: If I ought to exert myself to effect a certain event, which I cannot, however, of myself effect, this event must either take place from other causes, or it must not take place at all. It is only under such a condition that my exertion can, on either alternative, be useless, and not if the event depend wholly or in part for its accomplishment on my exertion itself, as the *conditio sine qua non*."[4] It is plain, however, that the refutation of this sophism does not at all affect the doctrine of necessity; for this doctrine, except in its very absurdest form, — the *Fatum Turcicum*, — makes no use of such a reasoning.

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[1] See Laertius, vii. 25. The observation in the text is from Facciolati, *Acroasis*, v. p. 57, ed. 1750. — ED.

[2] F. 91 b. ed Ald. Venet., 1546. — ED.

[3] The purpose of this sophism may be gathered from Arrian, but not the nature of the argument itself. It is also mentioned, though not explained, by Lucian, *Vit. Auct.*, c. 22 Plutarch, *Sympos.*, i. 1, 5. Gellius, *N. A.*, i. 2 Compare Facciolati, *Acroasis*, v. p. 57. — ED.

[4] Krug, *Logik*, p 424. — ED.

(c) *Sophisma polyzeteseos.*

Its various designations.

"The third fallacy is the *Sophisma polyzeteseos* or *quæstionis duplicis*, — *the sophism of continuous questioning*, which attempts, from the impossibility of assigning the limit of a relative notion, to show by continued interrogation the impossibility of its determination at all. There are certain notions which are only conceived as relative, — as proportional, and whose limits we cannot, therefore, assign by the gradual addition or detraction of one determination. But there is no consequence in the proposition, that, if a notion cannot be determined in this manner, it is incapable of all determination, and, therefore, absolutely inconceivable and null."[1] Such is the Sorites, the nature of which I have already explained to you. This reasoning, as applied to various objects, obtained various names, as, besides the Sorites or Acervus, we have the *crescens*,[2] — the φαλακρός or *calvus*,[3] — the ὑπερϑετικός, *superpositus* or *superlativus*,[4] — the ἡσυχάζων or *quiescens*, etc., etc.[5] The Sorites is well defined by Ulpian,[6] a sophism in which, by very small degrees, the disputant is brought from the evidently true to the evidently false. For example, I ask, Does one grain of corn make up a heap of grain? My opponent answers, — No. I then go on asking the same question of two, three, four, and so on *ad infinitum*, nor can the respondent find the number at which the grains begin to constitute a heap. On the other hand, if we depart from the answer, — that a thousand grains make a heap, the interrogation may be continued downward to unity, and the answerer be unable to determine the limit where the grains cease to make up a heap. The same process may be performed, it is manifest, upon all the notions of proportion, in space and time and degree, both in continuous and discrete quantity.[7]

The fourth and last fallacy of this class is the *sophisma heterozeteseos*, or *sophism of counter-questioning*,[8] and as applied to vari-

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[1] Krug, *Logik*, § 117. — ED.

[2] Wyttenbach, *Ad Plut. De Sera Num Vind.*, p. 559; *Præcepta Phil. Log.*, p. iii. c. 9, § 4. — ED.

[3] Diog. Laert., ii. 108. Cf. Gassendi, *De Log. Orig.*, c. 3. — ED.

[4] Epictetus, *Dissert.*, iii. 2, 2. As interpreted by Gassendi, *De Log. Orig.*, c. 6. But the true reading is probably ὑποϑετικούς. See Schweighæuser's note. — ED.

[5] Cicero, *Acad.*, ii. 29. Epictetus, *Dissert.* ii. 18, 19. — ED.

[6] *Lege*, 177. *De Verb Signif.* "Natura cavillationis, quam Græci σωρείτην appellarunt, hæc est, ut ab ea ab evidenter veris per brevissimas mutationes disputatio ad ea quæ evidentur falsa sunt perducatur." Quoted by Gassendi, *De Logicæ Origine et Varietate*, L. i. c. 3, p. 41, and by Menage, *Ad Laert.*, ii. 108. — ED.

[7] Krug, *Logik*, § 117. — ED.

[8] [See Gassendi, *Opera*, t. i. *De Log. Orig et Var.* L. i. c. 6, p. 51.]

(d) *Sophisma heterozeteseos.*

Its various names.

Its character.

The *Litigiosus.*

The case of Protagoras and Euathlus.

ous objects, it obtained, among the ancients, the names of *the Dilemma*,[1] — *the Cornutus*,[2] — *the Litigiosus*, — *the Achilles*,[3] — *the Mentiens*,[4] — *the Fallens*,[5] — *the Electra*,[6] — *the Obvelatus*,[7] — *the Reciprocus*,[8] — *the Crocodilinus*,[9] — *the* οὔτις,[10] — *the Inductio imperfecta;*[11] and to this should also be referred the Ass of Buridanus.[12] "It is a hypothetico-disjunctive reasoning, which rests on a certain supposition, and which, through a reticence of this supposition, deduces a fallacious inference. To take, for an example of this fallacy, the κεράτινος or Cornutus: — it is asked: — Have you cast your horns? — If you answer, I have; it is rejoined, Then you have had horns: if you answer, I have not, it is rejoined, Then you have them still.[13] — To this question, and to the inferences from it, the disjunctive proposition is supposed, — A certain subject has either had horns or has them still. This disjunction is, however, only correct if the question is concerning a subject to which horns previously belonged. If I do not suppose this, the disjunction is false; it must, consequently, thus run: — a certain subject has either had or not had horns. In the latter case they could not of course be cast. The alternative inferences (*then you have had them*, or *then you have them still*) have no longer ground or plausibility.[14] To take another instance in the *Litigiosus* or *Reciprocus*. Of the history of this famous dilemma there are two accounts, the Greek and the Roman. The Roman account is given us by Aulus Gellius,[15] and is there told in relation to an action between Protagoras, the prince of the Sophists, and Euathlus, a young man, his disciple. The disciple had covenanted to give his master a large sum to accomplish him as a legal rhetorician; the one half of the sum was paid down, and the other was to be paid on the day when Euathlus should plead and gain his first cause. But when the scholar, after the due course of preparatory instruction, was not in the same hurry to commence pleader as the master to obtain the remainder of his fee, Protagoras brought Euathlus into court, and addressed his opponent in the following reasoning: — Learn, most foolish of young men, that however matters may turn up (whether the decision to-day be in your favor or against you), pay me my demand you must. For if the judgment be against you, I shall obtain the fee by decree of the court, and if in your favor, I shall obtain it in terms of the compact, by which it became due on the very day you gained your first cause. You thus must fail, either by judgment or by stipulation. To this Euathlus rejoined: — Most sapient of masters, learn from your own argument, that whatever may be the finding of the court, absolved I must be from any claim by you. For if the decision be favorable, I pay nothing by the sentence of the judges, but if unfavorable, I pay nothing in virtue of the compact, because, though pleading, I shall not have gained my cause. The judges, says Gellius, unable to find a *ratio decidendi*, adjourned the case to an indefinite day, and ultimately left it undetermined. I find a parallel story told, among the Greek writers, by Arsenius, by the Scholiast of Hermogenes, and by Suidas,[1] of the rhetorician Corax (*anglicè* Crow) and his scholar Tisias. In this case, the judges got off by delivering a joke against both parties, instead of a decision in favor of either. We have here, they said, the plaguy egg of a plaguy crow, and from this circumstance is said to have originated the Greek proverb, κακοῦ κόρακος κακὸν ᾠὸν.

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[1] Hermogenes, *De Invent.*, L. iv., and *Proleg. ad Hermogenem.* See Walz's *Rhetores Græci*, vol. iii. p. 167, iv. p. 14. — Ed.

[2] Seneca, *Epist.*, 45. Menage, *Ad Diog. Laert.*, L. ii. 108. — Ed.

[3] Diog. Laert., L. ix. 23. Aristotle, *Phys.*, vi. 9. *Soph. Elench.*, 24. — Ed.

[4] Menage, *Ad Diog. Laert.*, L. ii. 108. Cicero, *Acad.*, ii. 29. — Ed.

[5] Diog. Laert., ii. 108. — Ed.

[6] Lucian, *Vit. Auct.*, § 22. Cf. Menage, *Ad Diog. Laert.*, L. ii. 108. — Ed.

[7] Menage, *ibid.* — Ed.

[8] Aulus Gellius, N. A., L. v. c. 10, 11. — Ed.

[9] Lucian, *l. c.* Quintilian, *Inst. Orat.*, i. 10. 5. Cf. Menage, *Ad Diog. Laert.*, L. ii. 108. — Ed.

[10] Ammonius, *Ad Arist. Categ.*, f. 58. Cf. Menage, *loc. cit.* — Ed.

[11] Cicero, *De Inventione*, L. i. c. 31. — Ed.

[12] See Denzinger, *Logik*, § 571, from whom these designations are taken. *Reid's Works*, p. 238. — Ed.

[13] Diog. Laert., vii. 187. — Ed.

[14] Krug, *Logik*, p. 425. — Ed.

[15] L. v. c. 10.

Parallel case of Corax and Tisias.

Herewith we terminate the First Great Division of Pure Logic, — Stoicheiology, or the Doctrine of Elements.

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[1] [Prolegomena to Hermogenes, in Walz's *Rhetores Græci*, tom. iv. pp. 13, 14. Arsenii Violetum, edit. Walz, Stuttgard, 1832, pp. 313, 314. Quoted by Sigwart, *Logik*, § 333, p 211, 3d edit. Suidas, quoted by Schottus *Adagia Græcorum*, p. 450, 1612.]

# LECTURE XXIV.

## PURE LOGIC.

## PART II.—METHODOLOGY.

### SECTION I.—METHOD IN GENERAL.

### SECTION II.—METHOD IN SPECIAL, OR LOGICAL METHODOLOGY

### I.—DOCTRINE OF DEFINITION.

Methodology.

Gentlemen,—We concluded, in our last Lecture, the consideration of Syllogisms, viewed as Incorrect or False; in other words, the doctrine of Fallacies, in so far as the fallacy lies within a single syllogism. This, however, you will notice, does not exhaust the consideration of fallacy in general, for there are various species of false reasoning which may affect a whole train of syllogisms. These—of which the *Petitio Principii*, the *Ignoratio Elenchi*, the *Circulus*, and the *Saltus in Concludendo*, are the principal—will be appropriately considered in the sequel, when we come to treat of the Doctrine of Probation or Demonstration. With Fallacies terminated the one Grand Division of Pure Logic,—the Doctrine of Elements, or Stoicheiology,—and I open the other Grand Division,—the Doctrine of Method, or Methodology,—with the following paragraph.

Par. LXXX. Method in general.

¶ LXXX. A Science is a complement of cognitions, having, in point of Form, the character of Logical Perfection; in point of Matter, the character of Real Truth.

The constituent attributes of Logical Perfection are the *Perspicuity*, the *Completeness*, the *Harmony*, of Knowledge. But the Perspicuity, Completeness, and Harmony of our cognitions are, for the human mind, possible only through *Method*.

Method in general denotes a procedure in the treatment of an object, conducted according to determinate rules. Method, in reference to Science, denotes, therefore, the arrangement and elaboration of cognitions, according to definite rules, with the view of conferring on these a Logical Perfection. The Methods by which we proceed in the treatment of the objects of our knowledge are two; or rather Method, considered in its integrity, consists of two processes, — *Analysis* and *Synthesis*.

I. The Analytic or Regressive; — in which, departing from the individual and the determined, we ascend always to the more and more general, in order finally to attain to ultimate principles.

II. The Synthetic or Progressive; — in which we depart from principles or universals, and from these descend to the determined and the individual.

Through the former we investigate and ascertain the reality of the several objects of science; through the latter we connect the fragments of our knowledge into the unity of a system.

Explication.
Possibility and Perfection of Thought.

In its Stoicheiology, or Doctrine of Elements, Logic considers the conditions of possible thought; for thought can only be exerted under the general laws of Identity, Contradiction, Excluded Middle, and Reason and Consequent; and through the general forms of Concepts, Judgments, and Reasonings. These, therefore, may be said to constitute the Elements of thought. But we may consider thought not merely as existing, but as existing well; that is, we may consider it not only in its possibility, but in its perfection; and this perfection, in so far as it is dependent on the form of thinking, is as much the object-matter of Logic as the mere possibility of thinking. Now that part of Logic which is conversant with the Perfection, with the Well-being of thought, is the Doctrine of Method, — Methodology.

Method in general, — what.

Method in general is the regulated procedure towards a certain end; that is, a process governed by rules, which guide us by the shortest way straight towards a certain point, and guard us against devious aberrations.[1] Now the end of thought is truth, — knowledge, —

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[1] [On Method, see Alex. Aphrod., *In Anal. Prior.*, f. $3^b$, Ald. 1520. Ammonius, *In Prœm. Porphyrii*, f. $21^b$, Ald. 1546. Philoponus, *In An. Prior.*, f. 4. *In An. Post.*, f. 94. Eustratius, *In An. Post.* ff. $1^b$, $53^b$. See also Molinæus, Zabarella, Nunnesius, Timpler, Downam.] [Molinæus, *Logica*, L. ii., *De Methodo*, p. 245 *et seq.* Zabarella, *Opera Logica*, *De Methodis*, L. i. c. 2, p. 134. Peter John Nunnesius, *De Constitutione Artis Dialecticæ*, p. 43 *et seq.*, ed. 1554, with relative commentary. Timpler, *Systema Logicæ*, L. iv. c. viii. p. 716 *et seq.* G. Downam, *Commentarii in P. Rami Dialecticam*, L. ii. c. 17, p. 472 *et seq.* On the distinction between Method and Order, see *Lectures on Metaphysics*, lect. vi. p. 68, and note — Ed.]

science, — expressions which may here be considered as convertible.

Science, — what.

Science may, therefore, be regarded as the perfection of thought, and to the accomplishment of this perfection the Methodology of Logic must be accommodated and conducive. But Science, that is, a system of true or certain knowledge, supposes two conditions. Of these, the first has a relation to the knowing subject, and supposes that what is known is known clearly and distinctly, completely, and in connection. The second has a relation to the objects known, and supposes that what is known has a true or real existence. The former of these constitutes the Formal Perfection of science, the latter is the Material.

Its perfection Formal and Material.

Logic takes into account only the formal perfection of science.

Now, as Logic is a science exclusively conversant about the form of thought, it is evident that of these two conditions, — of these two elements, of science or perfect thinking, Logic can only take into account the formal perfection, which may, therefore, be distinctively denominated the *logical perfection* of thought. Logical Methodology will, therefore, be the exposition of the rules and ways by which we attain the formal or logical perfection of thought.

Logical Methodology, — what.

Method in general consists of two correlative and complementary processes, — Analysis and Synthesis.

But Method, considered in general, — considered in its unrestricted universality, — consists of two processes, correlative and complementary of each other. For it proceeds either from the whole to the parts, or from the parts to the whole. As proceeding from the whole to the parts, that is, as resolving, as unloosing, a complex totality into its constituent elements, it is Analytic; as proceeding from the parts to the whole, that is, as recomposing constituent elements into their complex totality, it is Synthetic. These two processes are not, in strict propriety, two several methods, but together constitute only a single method. Each alone is imperfect; — each is conditioned or consummated by the other; and, as I formerly observed,[1] Analysis and Synthesis are as necessary to themselves and to the life of science, as expiration and inspiration, in connection, are necessary to each other, and to the possibility of animal existence.

It is here proper to make you aware of the confusion which prevails in regard to the application of the terms *Analysis* and

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[1] See *Lectures on Metaphysics*, p. 70. — Ed.

*Synthesis.*[1] It is manifest, in general, from the meaning of the words, that the term *analysis* can only be applied to the separation of a whole into its parts, and that the term *synthesis* can only be applied to the collection of parts into a whole. So far, no ambiguity is possible, no room is left for abuse. But you are aware that there are different kinds of whole and parts; and that some of the wholes, like the whole of Comprehension (called also the *Metaphysical*), and the whole of Extension, (called also the *Logical*), are in the inverse ratio of each other: so that what in the one is a part, is necessarily in the other a whole. It is evident, then, that the counter processes of Analysis and Synthesis, as applied to these counter wholes and parts, should fall into one, or correspond; inasmuch as each in the one quantity should be diametrically opposite to itself in the other. Thus Analysis, as applied to Comprehension, is the reverse process of Analysis as applied to Extension, but a corresponding process with Synthesis; and *vice versa*. Now, should it happen that the existence and opposition of the two quantities are not considered, — that men, viewing the whole of Extension or the whole of Comprehension, each to the exclusion of the other, must define Analysis and Synthesis with reference to that single quantity which they exclusively take into account; — on this supposition, I say, it is manifest that, if different philosophers regard different wholes or quantities, we may have the terms *analysis* and *synthesis* absolutely used by different philosophers in a contrary or reverse sense. And this has actually happened. The ancients, in general, looking alone to the whole of Extension, use the terms *analysis*

Confusion in regard to the application of the terms Analysis and Synthesis.

These counter processes as applied to the counter wholes of Comprehension and Extension, correspond with each other.

Hence the terms Analysis and Synthesis used in a contrary sense.

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[1] [Zabarella, *Opera Logica*, *Liber de Regressu*, pp. 481, 489. See also, *In Anal. Poster.*, L. ii. text 81, pp. 1212, 1213. Molinæus, *Logica*, L. ii. Appendix, p. 241 *et seq.*, who notices that both the Analytic and Synthetic order may proceed from the general to the particular. See also, to the same effect, Hoffbauer, *Über die Analysis in der Philosophie*, p. 41 *et seq.*, Halle, 1810. Gassendi, *Physica*, Sectio iii. Memb. Part. L. ix. *Opera*, t. ii. p. 460. Victorin, *Neue natürlichere Darstellung der Logik*, § 214. Trendelenburg, *Elementa Logices Aristoteleæ*, p. 89. Troxler, *Logik*, ii. p. 100, n. **. Krug, *Logik*, § 114, p. 195, n. **, and § 120, p. 431. Wyttenbach makes Synthetic method progress from particulars to universals; other logicians generally the reverse.] — [See his *Præcepta Phil. Logicæ*, P. III. c. i. § 3, p. 84. 1781. — "Mentem suapte natura Syntheticam Methodum sequi, eaque ad universales ideas pervenire. . . . Contrarium est iter Analyticæ Methodi, quæ ab universalibus initium ducit et ad peculiaria progreditur, dividendo Genera in suas Formas." "Contra communem sensum et verborum naturam, Syntheticam vocant Methodum, quæ dividit, Analyticam contra, quæ componit." Præf. *sub fin.* In the edition of the *Præcepta* by Maass, Wyttenbach is made to say precisely the reverse of what he lays down in the original edition. See *Præc. Phil. Log.*, ed. Maass, § 64. — Ed.]

and *analytic* simply to denote a division of the genus into species, — of the species into individuals; the moderns, on the other hand, in general, looking only at the whole of Comprehension, employ these terms to express a resolution of the individual into its various attributes.[1] But though the contrast in this respect between the ancients and moderns holds in general, still it is exposed to sundry exceptions; for, in both periods, there are philosophers found at the same game of cross-purposes with their contemporaries as the ancients and moderns in general are with each other. This difference, which has never, as far as I know, been fully observed and stated, is the cause of great confusion and mistake. It is proper, therefore, when we use these terms, to use them not in exclusive relation to one whole more than to another; and, at the same time, to take care that we guard against the misapprehension that might arise from the vague and one-sided view which is now universally prevalent. So much for the meaning of the words *analytic* and *synthetic*, which, by the way, I may notice, are, like most of our logical terms, taken from Geometry.[2]

The Synthetic Method has been called the Progressive, and the Analytic the Regressive. These designations wholly arbitrary, and of various application.

The Synthetic Method is likewise called the *Progressive;* the Analytic is called the *Regressive.* Now it is plain that this application of the terms *progressive* and *regressive* is altogether arbitrary. For the import of these words expresses a relation to a certain point of departure, — a *terminus a quo*, and to a certain point of termination, — a *terminus ad quem;* and if these have only an arbitrary existence, the correlative words will, consequently, only be of an arbitrary application. But it is manifest that the point of departure, — the point from which the Progressive process starts, — may be either the concrete realities of our experience, — the *principiata*, — the *notiora nobis;* or the abstract generalities of intelligence, — the *principia*, — the *notiora natura.* Each of these has an equal right to be regarded as the starting-point. The Analytic process is chronologically first in the order of knowledge, and we may, therefore, reasonably call it the *progressive*, as starting from the primary data of our observation. On the other hand, the Synthetic process, as following the order of constitution, is first in the order of nature, and we may, therefore, likewise reasonably call it the *progressive*, as starting from the primary elements of existence. The application of these terms as synonyms of the analytic and synthetic processes, is, as wholly arbitrary, manifestly open to confusion and contradiction. And such has been the case. I find that the philosophers are as much at cross-purposes in their application of these terms to the Analytic and Synthetic processes, as in the application of analysis and synthesis to the different wholes.

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[1] [See Aristotle, *Physica*, L. iv. c. 3. Timpler, *Logicæ Systema*, L. ii. c. i qu. 11. p. 248.]

[2] See above, p 196, n. 4. — ED. [On the Analysis of Geometry, see Plotinus, *Ennead.* iv. L. ix. c. 5. Philoponus, *In An. Post.*, f. 36a, Venet. 1534.]

In general, Synthesis has been designated the Progressive, and Analysis the Regressive Process.

In general, however, both in ancient and modern times, Synthesis has been called the *Progressive*, Analysis the *Regressive*, process; an application of terms which has probably taken its rise from a passage in Aristotle, who says that there are two ways of scientific procedure, — the one from principles (ἀπὸ τῶν ἀρχῶν), the other to principles (ἐπὶ τὰς ἀρχάς). From this, and from another similar passage in Plato, (?) the term *progressive* has been applied to the process of Comprehensive Synthesis (*progrediendi a principiis ad principiata*), the term *regressive*, to the process of Comprehensive Analysis (*progrediendi a principiatis ad principia.*)[1]

Method in special

So much for the general relations of Method to thought, and the general constituents of Method itself. It now remains to consider what are the particular applications of Method, by which Logic accomplishes the Formal Perfection of thought. In doing this, it is evident that, if the formal perfection of thought is made up of various virtues, Logic must accommodate its method to the acquisition of these in detail; and that the various processes by which these several virtues are acquired, will, in their union, constitute the system of Logical Methodology. On this I will give you a paragraph.

Par. LXXXI. Logical Methodology, — its Three Parts.

¶ LXXXI. The Formal Perfection of thought is made up of the three virtues or characters: — 1°, Of *Clearness;* 2°, Of *Distinctness*, involving *Completeness;* and, 3°, Of *Harmony*. The character of Clearness depends principally on the determination of the Comprehension of our notions; the character of Distinctness depends principally on the development of the Extension of our notions; and the character of Harmony, on the mutual Concatenation of our notions. The rules by which these three conditions are fulfilled, constitute the Three Parts of Logical Methodology. Of these, the first constitutes the *Doctrine of Definition;* the second, the *Doctrine of Division;* and the third, the *Doctrine of Probation.*[1]

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[1] *Eth. Nic.*, i. 2 (4). The reference to Plato, whom Aristotle mentions as making a similar distinction, is probably to be found by comparing two separate passages in the *Republic*, B. iv. p. 435, vi. p. 504. — Ed. [Plato is said to have taught Analysis to Leodamas the Thasian. See Laertius, L. iii. 24, and Proclus, quoted in Is. Casaubon's note. On the views of Method of Aristotle and Plato, see Scheibler and Downam.] [Scheibler, *Opera Logica*, Pars. iv., *Tract. Syllog.*, c. xvii., *De Methodo.* tit. 7, p. 603. Downam. *Com. in P. Rami Dialecticam*, L. ii. c. 17, p. 482. — Ed.]

Explication

"When we turn attention on our thoughts, and deal with them to the end that they may be constituted into a scientific whole, we must perform a threefold operation. We must, first of all, consider what we think, that is, what is comprehended in a thought. In the second place, we must consider how many things we think of, that is, to how many objects the thought extends or reaches, that is, how many are conceived under it. In the third place, we must consider why we think so and so, and not in any other manner, in other words, how the thoughts are bound together as reasons and consequents. The first consideration, therefore, regards the comprehension; the second, the extension; the third, the concatenation of our thoughts. But the comprehension is ascertained by definitions; the extension by divisions; and the concatenation by probations."[2] We proceed, therefore, to consider these Three Parts of Logical Methodology in detail; and first, of Declaration or Definition, in regard to which I give the following paragraph.

Par LXXXII. I. The Doctrine of Declaration or Definition.

¶ LXXXII. How to make a notion Clear, is shown by the logical doctrine of *Declaration*, or *Definition* in its wider sense. A Declaration (or Definition in its wider sense) is a Categorical Proposition, consisting of two clauses or members, viz., of a Subject Defined (*membrum definitum*) and of the Defining Attributes of the subject, that is, those by which it is distinguished from other things (*membrum definiens*). This latter member really contains the Definition, and is often itself so denominated. Simple notions, as containing no plurality of attributes, are incapable of definition.[3]

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[1] Krug, *Logik*, § 121a. — ED. [Ramus was the first to introduce Method as a part of Logic under Syllogistic (see his *Dialectica*, L. ii c. 17), and the Port Royalists (1662) made it a fourth part of logic. See *La Logique ou L'Art de Penser*, Prem. Dis., p. 26, pp. 47, 50. Quat. Part., p 445 *et seq.* ed. 1775 Gassendi, in his *Institutio Logica*, has Pars iv., *De Methodo.* He died in 1655; his *Logic* appeared posthumously in 1658. John of Damascus speaks strongly of Method in his *Dialectic*, ch. 68. and makes four special logical methods, Division, Definition, Analysis, Demonstration. Eustachius treats of Method under Judgment, and Scheibler under Syllogistic.] [Eustachius, *Summa Philosophiæ. Logica*, P. ii. Tract. 2. *De Methodo*, p. 106, ed. Lugd. Batav., 1747 First edition, 1609. Scheibler, *Opera Logica*, Pars iv. c. xviii. p. 595 *et seq.* — ED ]

[2] Krug, *Logik*, § 121a. — ED.

[3] Krug, *Logik*, § 121b. — ED.

Explication.

The terms Declaration and Definition express the same process in different aspects.

The terms *declaration* and *definition*, which are here used as applicable to the same process, express it, however, in different aspects. The term *declaration* (*declaratio*) is a word somewhat vaguely employed in English; it is here used strictly in its proper sense of *throwing light upon*, — *clearing up*. The term *definition* (*definitio*) is employed in a more general, and in a more special, signification. Of the latter we are soon to speak. At present, it is used simply in the meaning of an *enclosing within limits*, — the *separating a thing from others*. Were the term *declaration* not of so vague and vacillating a sense, it would be better to employ it alone in the more general acceptation, and to reserve the term *definition* for the special signification.

**Par. LXXXIII. Definition in its stricter sense, — what.**

¶ LXXXIII. The process of Definition is founded on the logical relations of Subordination, Coördination, and Congruence. To this end we discriminate the constituent characters of a notion into the *Essential*, or those which belong to it in its unrestricted universality, and into the *Unessential*, or those which belong to some only of its species. The Essential are again discriminated into *Original* and *Derivative*, a division which coincides with that into Internal or Proper, and External. In giving the sum of the original characters constituent of a notion, consists its *Definition* in the stricter sense. A Definition in the stricter sense must consequently afford at least two, and properly only two, original characters, viz., that of the *Genus* immediately superior (*genus proximum*), and that of the *Difference* by which it is itself marked out from its coördinates as a distinct species (*nota specialis, differentia specifica*).[1]

Explication.

Various names of Declaration.

Explication.

Exposition.

Declarations (or definitions in the wider sense) obtain various denominations, according as the process is performed in different manners and degrees. A Declaration is called an *Explication* (*explicatio*), when the predicate or defining member indeterminately evolves only some of the characters belonging to the subject. It is called an *Exposition* (*expositio*), when the evolution of a notion is continued through

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[1] [Cf. Aristotle. *Topica*. i. 6. Keckermann, pp 199, 656. Scheibler, *Topica*, c 30. Richter, *Systema Logicæ Minus*, L. i. c. 17. *Opera*, t i. *Logik*, p. 94.]

Description. Definition proper

several explications. It is called a *Description* (*descriptio*), when the subject is made known through a number of concrete characteristics. Finally, it is called a *Definition Proper*, when, as I have said, two of the essential and original attributes of the defined subject are given, whereof the one is common to it with the various species of the same genus, and the other discriminates it from these.[1]

Definitions, — Nominal, Real, and Genetic.

"Definitions are distinguished also into Verbal or Nominal, into Real, and into Genetic (*definitiones nominales, reales, geneticæ*), according as they are conversant with the meaning of a term, with the nature of a thing, or with its rise or production.[2] Nominal Definitions are, it is evident, merely explications. They are, therefore, in general only used as preliminary, in order to prepare the way for more perfect declarations. In Real Definitions the thing defined is considered as already there, as existing (ὄν), and the notion, therefore, as given, precedes the definition. They are thus merely analytic, that is, nothing is given explicitly in the predicate or defining member, which is not contained implicitly in the subject or member defined. In Genetic Definitions the defined subject is considered as in the progress to be, as becoming γιγνόμενον; the notion, therefore, has to be made, and is the result of the definition, which is consequently synthetic, that is, places in the predicate or defining member more than is given in the subject or member defined. As examples of these three species, the following three definitions of a circle may suffice: — 1. The Nominal Definition, — The word *circle* signifies a uniformly curved line. 2. The Real Definition, — A circle is a line returning upon itself, of which all the parts are equidistant from a given point. 3. The Genetic Definition, — A circle is formed when we draw around, and always at the same distance from, a fixed point, a movable point which leaves its trace, until the termination of the movement coincides with the commencement.[3] It is to be observed that only those notions can be genetically defined, which relate to quantities represented in time and space. Mathematics are principally conversant with such notions, and it is to be noticed that the mathematician usually denominates such genetic definitions *real definitions*, while the others he calls without distinction *nominal definitions*."[4]

The laws of Definition are given in the following paragraph.

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[1] Cf. Krug, *Logik*, § 122. — Ed.

[2] [Cf. Reusch, *Systema Logicum*, § 309 *et seq.*]

[3] This example is taken, with some alteration, from Wolf, *Philosophia Rationalis*, § 191 — Ed.

[4] Krug, *Logik*, § 122. Anm. 3, pp. 448, 449. — Ed.

Par. LXXXIV. Definition, — its Laws.

¶ LXXXIV. A definition should be Adequate (*adequata*), that is, the subject defined, and the predicate defining, should be equivalent or of the same extension. If not, the sphere of the predicate is either less than that of the subject, and the definition Too Narrow (*angustior*), or greater, and the definition Too Wide (*latior*).

II. It should not define by Negative or Divisive attributes (*Ne sit negans, ne fiat per disjuncta*).

III. It should not be Tautological, — what is contained in the defined, should not be repeated in the defining clause (*Ne sit circulus vel diallelon in definiendo*).

IV. It should be Precise, that is, contain nothing unessential, nothing superfluous (*Definitio ne sit abundans*).

V. It should be Perspicuous, that is, couched in terms intelligible, and not figurative, but proper and compendious.[1]

Explication. First Rule.

The First of these rules: — That the definition should be adequate, that is, that the *definiens* and *definitum* should be of the same extension, is too manifest to require much commentary. Is the definition too wide? — then more is declared than ought to be declared; is it too narrow? — then less is declared than ought to be declared; — and, in either case, the definition does not fully accomplish the end which it proposes. To avoid this defect in definition, we must attend to two conditions. In the first place, that attribute should be given which the thing defined has in common with others of the same class; and, in the second place, that attribute should be given which not only distinguishes it in general from all other things, but proximately from things which are included with it under a common class. This is expressed by Logicians in the rule — *Definitio constet genere proximo et differentia ultima*, — Let the definition consist of the nearest genus and of the lowest difference. But as the notion and its definition, if this rule be obeyed, are necessarily identical or convertible notions, they must necessarily have the same extent; consequently, everything to which the definition applies, and nothing to which it does not apply, is the thing defined. Thus: — if the definition, *Man is a rational animal*, be adequate, we shall be able to say — *Every rational animal is human: — nothing which is not a rational animal is human.* But we cannot say this, for though this may be true of this earth, we can conceive in other worlds rational animals which are not human. The definition is, therefore, in this case too wide; to make it adequate, it will be necessary to add *terrestrial* or some such term — as, *Man is a rational animal of this earth.* Again, were we to define Man, — *a rationally acting animal of this earth,* — the definition would be too narrow; for it would be false to say, *no animal of this earth not acting rationally is human*, for not only children, but many adult persons would be excluded by this definition, which is, therefore, too narrow.[1]

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[1] Cf. Krug, *Logik*, § 123. — ED. [Victorin, *Logik*, § 223 *et seq.* Sigwart, *Handbuck zu Vorlesungen uber die Logik*, § 371. Boethius, *De Definitione*, *Opera*, p. 648 *et seq.* Buffier, *Veritez de Consequence*, § 45–51. Goclenius, *Lexicon Philosophicum*, *v.* *Definitio*, p. 500.]

Second Rule

The Second Rule is, — That the definition should not be made by negations, or disjunctions. In regard to the former, — negations, — that we should define a thing by what it is, and not by what it is not, — the reason of the rule is manifest. The definition should be an affirmative proposition, for it ought to contain the positive, the actual, qualities of the notion defined, that is, the qualities which belong to it, and which must not, therefore, be excluded from or denied of it. If there are characters which, as referred to the subject, afford purely negative judgments; — this is a proof that we have not a proper comprehension of the notion, and have only obtained a precursory definition of it, enclosing it within only negative boundaries. For a definition which contains only negative attributions, affords merely an empty notion, — a notion which is to be called a *nothing;* for, as some think, it must at least possess one positive character, and its definition cannot, therefore, be made up exclusively of negative attributes. If, however, a notion stands opposed to another which has already been declared by positive characters, it may be defined by negative characters, — provided always that the genus is positively determined. Thus Cuvier and other naturalists define a certain order of animals by the negation of a spine or back-bone, — the *invertebrata* as opposed to the *vertebrata;* and many such definitions occur in Natural History.

For a similar reason, the definition must not consist of divisive or disjunctive attributions. The end of a definition is a clear and distinct knowledge. But to say that a thing is this or that or the other, affords us either no knowledge at all, or at best only a vague and obscure knowledge. If the disjunction be contradictory, its enunciation is, in fact, tantamount to zero; for to say that a thing either is or is not so and so, is to tell us that of which we required no assertion to assure us. But a definition by disparate alternatives is, though it may vaguely circumscribe a notion, only to be considered as a prelusory definition, and as the mark of an incipient and yet imperfect knowledge. We must not, however, confound definitions by divisive attributes with propositions expressive of a division.

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[1] Cf. Krug, *Logik*, § 123. Anm. i — Ed.

Third Rule.
Defining in a circle.

The Third Rule is, — "The definition should not be tautological; that is, what is defined should not be defined by itself. This vice is called *defining in a circle.* This rule may be violated either immediately or mediately. The definition, — *Law is a lawful command,* — is an example of the immediate circle. A mediate circle requires, at least, two correlative definitions, a principal and a subsidiary. For example, — *Law is the expressed wish of a ruler, and a ruler is one who establishes laws.* The circle, whether immediate or mediate, is manifest or occult according as the thing defined is repeated in the same terms, or with other synonymous words. In the previous example it was manifest. . In the following it is concealed : — *Gratitude is a virtue of acknowledgment, — Right is the competence to do or not to do.* Such declarations may, however, be allowed to stand as prelusory or nominal definitions. Concealed circular definitions are of very frequent occurrence, when they are at the same time mediate or remote ; for we are very apt to allow ourselves to be deceived by the difference of expression, and fancy that we have declared a notion when we have only changed the language. We ought, therefore, to be strictly on our guard against this besetting vice. The ancients called the circular definition also by the name of *Diallelon*, as in this case we declare the *definitum* and the *definiens* reciprocally by each other (δι' ἀλλήλων).[1] In probation there is a similar vice which bears the same names."[2] We may, I think, call them by the homely English appellation of the *Seesaw.*

Fourth Rule.

The Fourth Rule is, — "That the definition should be precise; that is, contain nothing unessential, nothing superfluous. Unessential or contingent attributes are not sufficiently characteristic, and as they are now present, now absent, and may likewise be met with in other things which are not comprehended under the notion to be defined, they, consequently, if admitted into a definition, render it sometimes too wide, sometimes too narrow. The well-known Platonic definition, — '*Man is a two-legged animal without feathers,*' — could, as containing only unessential characters, be easily refuted, as was done by a plucked cock.[1] And when a definition is not wholly made up of such attributes, and when, in consequence of their intermixture with essential characters, the definition does not absolutely fail, still there is a sin committed against logical purity or precision, in assuming into the declaration qualities such as do not determinately designate what is defined. On the same principle, all derivative characters ought to be excluded from the definition; for although they may necessarily belong to the thing defined, still they overlay the declaration with superfluous accessories, inasmuch as such characters do not designate the original essence of the thing, but are a mere consequence thereof. This fault is committed in the following definition: — *The Circle is a curved line returning upon itself, the parts of which are at an equal distance from the central point.* Here precision is violated, though the definition be otherwise correct. For that every line returning upon itself is curved, and that the point from which all the parts of the line are equidistant is the central point, — these are mere consequences of the returning on itself, and of the equidistance. Derivative characters are thus mixed up with the original, and the definition, therefore, is not precise."[2]

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[1] Compare Sextus Empiricus, *Pyrrh. Hyp.*, i. 169, ii. 68. — Ed.

[2] Krug, *Logik*, § 123. Anm. 3. — Ed.

Fifth Rule.

The Fifth rule is, — "That the definition should be perspicuous, that is, couched in terms intelligible, not figurative, and compendious. That definitions ought to be perspicuous, is self-evident. For why do we declare or define at all? The perspicuity of the definition depends, in the first place, on the intelligible character of the language, and this again depends on the employment of words in their received or ordinary signification. The meaning of words, both separate and in conjunction, is already determined by conventional usage; when, therefore, we hear or read these, we naturally associate with them their ordinary meaning. Misconceptions of every kind must, therefore, arise from a deviation from the accustomed usage; and though the definition, in the sense of the definer, may be correct, still false conceptions are almost inevitable for others. If such a deviation becomes necessary, in consequence of the common meaning attached to certain words not corresponding to certain notions, there ought at least to be appended a comment or nominal definition, by which we shall be warned that such words are used in an acceptation wider or more restricted than they obtain in ordinary usage. But, in the second place, words ought not only to be used in their usual signification, — that signification.

In order to perspicuity in Definition, 1. The language must be intelligible.

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[1] Diog. Laert, vi. 40. — Ed.

[2] Krug, *Logik*, § 123. Anm. 2. — Ed.

if the definition be perspicuous, must not be figurative but proper. Tropes and figures are logical hieroglyphics, and themselves require a declaration. They do not indicate the thing itself, but only something similar."[1] Such, for example, are the definitions we have of Logic as the *Pharus Intellectus*, — the *Lighthouse of the Understanding*, — the *Cynosura Veritatis*, — the *Cynosure of Truth*, — the *Medicina Mentis*, — the *Physic of the Mind*, etc.[2]

2. The meaning must be not figurative, but proper

"However, many expressions, originally metaphorical (such as *conception*, *imagination*, *comprehension*, *representation*, etc. etc.), have by usage been long since reduced from figurative to proper terms, so that we may employ these in definitions without scruple, — nay frequently must, as there are no others to be found.

"In the third place, the perspicuity of a definition depends upon its brevity. A long definition is not only burthensome to the memory, but likewise to the understanding, which ought to comprehend it at a single jet. Brevity ought not, however, to be purchased at the expense of perspicuity or completeness."[3]

3 The definition must be brief.

"The rules hitherto considered proximately relate to Definitions in the stricter sense. In reference to the other kinds of Declaration, there are certain modifications and exceptions admitted. These Dilucidations or Explications, as they make no pretence to logical perfection, and are only subsidiary to the discovery of more perfect definitions, are not to be very rigidly dealt with. They are useful, provided they contain even a single true character by which we are conducted to the apprehension of others. They may, therefore, be sometimes too wide, sometimes too narrow. A contingent and derivative character may be also useful for the discovery of the essential and original. Even Circular Definitions are not here absolutely to be condemned, if thereby the language is rendered simpler and clearer. Figurative Expressions are likewise in them less faulty than in definitions proper, inasmuch as such expressions, by the analogies they suggest, contribute always something to the illustration of the notion.

The other kinds of Declaration.

Dilucidations or Explications.

Circular Definitions.

Figurative Expressions.

"In regard to Descriptions, these must be adequate, and no circle is permitted in them. But they need not be so precise as to admit of no derivative or contingent characters. For descriptions ought to enumerate the characters of a thing as fully as possible; and, consequently, they cannot be so brief as definitions. They cannot, however, exceed a certain measure in point of length."[1]

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[1] Krug, *Logik*, § 123. Anm. 4. — Ed.

[2] See above, p. 25. — Ed.

[3] Krug, *ibid.* — Ed.

Descriptions

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[1] Krug, *Logik*, § 123. Anm. 5. — Ed.

# LECTURE XXV.

## METHODOLOGY.

## SECTION II.—LOGICAL METHODOLOGY.

### II.—DOCTRINE OF DIVISION.

Division.

I NOW proceed to the Second Chapter of Logical Methodology,—the Doctrine of Division,—the doctrine which affords us the rules of that branch of Method, by which we render our knowledge more distinct and exhaustive. I shall preface the subject of Logical Division by some observations on Division in general.

Division in general

"Under Division (*divisio*, διαίρεσις) we understand in general the sundering of the whole into its parts.[1] The object which is divided is called the *divided whole* (*totum divisum*), and this whole must be a connected many,—a connected multiplicity, for otherwise no division would be possible. The divided whole must comprise at least one character, affording the condition of a certain possible splitting of the object, or through which a certain opposition of the object becomes recognized; and this character must be an essential attribute of the object, if the division be not aimless and without utility. This point of view, from which alone the division is possible, is called the *principle of the division* (*principium sive fundamentum divisionis*); and the parts which, by the distraction of the whole, come into view, are called the *divisive members* (*membra dividentia*). When a whole is divided into its parts, these parts may, either all or some, be themselves still connected multiplicities; and if these are again divided, there results a *subdivision* (*subdivisio*), the several parts of which are called the *subdivisive members* (*membra subdividentia*). One and the same object may, likewise, be differently divided from different points of view, whereby *condivisions*

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[1] [On Division and its various kinds, see Ammonius, *De Quinque Vocibus*, f 6a, Ald. 1546.]

(*condivisiones*) arise, which, taken together, are all reciprocally coördinated. If a division has only two members, it is called a *dichotomy* (*dichotomia*); if three, a *trichotomy* (*trichotomia*); if four, a *tetrachotomy;* if many, a *polytomy*, etc.

**Division of two species, — Partition and Logical Division.**

"Division, as a genus, is divided into two species, according to the different kind of whole which it sunders into parts.[1] These parts are either contained in the divided whole, or they are contained under it. In the former case the division is called a *partition* (*partitio*, ἀπαρίθμησις),[2] in the latter, it is named a *logical division*.[3] Partition finds an application only when the object to be divided is a whole compounded of parts, — consequently, where the notion of the object is a complex one; Logical Division, on the other hand, finds its application only where the notion contains a plurality of characters under it, and where, consequently, the notion is a universal one. The simple notion is thus the limit of Partition; and the individual or singular is thus the limit of Division.

Partition either Real or Ideal.

Partition is divided into a *physical* or *real*, when the parts can actually be separated from each other; and into a *metaphysical* or *ideal*, when the parts can only be sundered by Abstraction.[4] It may be applied in order to attain to a clear knowledge of the whole, or to a clear knowledge of the parts. In the former case, the parts are given and the whole is sought; in the latter, the whole is given and the parts are sought. If the whole be given and the parts sought out, the object is first of all separated into its proximate, and, thereafter, into its remoter parts, until either any further partition is impossible, or the partition has attained its end. To this there is, however, required an accurate knowledge of the object, of its parts proximate and remote, and of the connection of these parts together, as constituting the whole. We must, likewise, take heed whether the partition be not determined from some particular point of view, in consequence of which the notions of more proximate and more remote may be very vague and undetermined. If the parts be given, and from them the whole sought out, this is accomplished when we have discovered the order, — the arrangement, of the parts; and this again is discovered when the principle of division is discovered; and of this we must obtain a knowledge, either from the general nature of the thing, or from the particular end we have in view. If, for example, a multitude of books, of every various kind, are arranged into the whole of a well-ordered library, — in this case the greater or lesser similarity of subject will afford, either exclusively or mainly, the principle of division. It happens, however, not unfrequently, that the parts are ordered or arranged according to different rules, and by them connected into a whole; and, in this case, as the different rules of the arrangement cannot together and at once accomplish this, it is proper that the less important arrangement should yield to the more important; as, for example, in the ordering of a library, when, besides the contents of the books, we take into account their language, size, antiquity, binding, etc."[1]

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[1] [On various kinds of Wholes, see Caramuel, *Rationalis et Realis Philosophia*, L. iv. sect. iii. disp. iv. p. 277,] [and above, *Lectures on Metaphysics*, p. 507; *Lectures on Logic*, p. 142. — ED.]

[2] Ἀπαρίθμησις is properly a rhetorical term, and signifies the division of a subject into successive heads, *first*, *second*, etc. See Hermogenes, Περὶ ἰδεῶν. *Rhetores Græci*, i. p. 104, ed. Ald — ED.

[3] [See Keckermann, *Systema Logicæ*, L. i. c 3. *Opera*, t. i. p. 667. Drobisch, *Neue Darstellung der Logik*, § 112. Krug, *Logik*, § 124. Anm. 2]

[4] By Partition, *triangle* may be distinguished, 1°, Into a certain portion of space included within certain boundaries; 2°, Into sides and angles; 3°, Into two triangles, or into a trapezium and a triangle. The first two partitions are ideal, they cannot be actually accomplished The last is real, it may.

By Division, *triangle* is distinguished, 1°, Into the two species of rectilinear and curvilinear. 2°, Both of these are again subdivided (A) by reference to the sides, (B) by reference to the angles. By reference to the sides, *triangles* are divided into the three species of equilateral, isosceles, and scalene. (The dichotomic division would, however, be here more proper.) By reference to the angles, they are divided into the three species of rectangular, *i e.* triangle which has one of its angles right; into amblygon, or triangle which has one of its angles obtuse; and into oxygon, *i. e.* triangle which has its three angles acute.

By Definition, *triangle* is distinguished into figure of three sides, equal to triangular figure; that is, into *figure*, the proximate genus, and *trilateral* or *three-sided*, the differential quality.

I now proceed to Logical Division, on which I give you the following paragraph:

Par. LXXXV. Logical Division.

¶ LXXXV. The Distinctness and Completeness of our knowledge is obtained by that logical process which is termed *Division* (*divisio*, διαίρεσις). Division supposes the knowledge of the whole to be given through a foregone process of Definition or Declaration; and proposes to discover the parts of this whole which are found and determined not by the development of the Comprehension, but by the development of the Extension. As Logical Definition, therefore, proposes to render the characters contained in an object, that is, the comprehension of a reality or notion, Clear; Logical Division proposes to render the characters contained under an object, that is, the extension of a notion, Distinct and Exhaustive. Division is, therefore, the evolution of the extension of a notion: and it is expressed in a disjunctive proposition, of which the notion divided constitutes the subject, and the notions contained under it, the predicate. It is, therefore, regulated by the law which governs Disjunctive Judgments, (the Principle of Excluded Middle), although it is usually expressed in the form of a Copulative Categorical Judgment. The rules by which this process is regulated are seven:

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[1] Esser, *Logik*, §§ 134, 135, p. 261—64. — ED.

1°. Every Division should be governed by some principle, (*Divisio ne careat fundamento*).

2°. Every Division should be governed by only a single principle.

3°. The principle of Division should be an actual and essential character of the divided notion, and the division, therefore, neither complex nor without a purpose.

4°. No dividing member of the predicate must by itself exhaust the subject.

5°. The dividing members, taken together, must exhaust, but only exhaust, the subject.

6°. The divisive members must be reciprocally exclusive.

7°. The divisions must proceed continuously from immediate to mediate differences (*Divisio ne fiat per saltum*).

Explication.

In this paragraph are contained, first, the general Principles of Logical Division, and, secondly, the Laws by which it is governed. I shall now illustrate these in detail.

In the first place, it is stated that "the distinctness and completeness of our knowledge is obtained by that logical process which is termed *Division* (*divisio*, *διαίρεσις*). Division supposes the knowledge of the whole to be given through a foregone process of definition, and proposes to discover the parts of this whole which are found and determined not by the development of the comprehension, but by the development of the extension. As logical definition, therefore, proposes to render the characters contained in a notion, that is, its comprehension, clear; logical division proposes to render the characters contained under an object, that is, the extension of a notion, distinct. Division is, therefore, the evolution of the extension of a notion, and it is expressed in a disjunctive proposition, of which the notion divided constitutes the subject, and the notions contained under it, the predicate. It is, therefore, regulated by the law which governs disjunctive judgments (the principle of excluded middle), although it be usually expressed in the form of a copulative categorical judgment."

End of Division is Distinctness, which involves Completeness.

The special virtue, the particular element, of perfect thinking, which Division enables us to acquire, is Distinctness, but, at the same time, it is evident that it cannot accomplish this without rendering our thinking more complete. This, however, is only a secondary and collateral result; for the problem which division proximately and principally proposes to solve is, — to afford us a distinct consciousness of the extension of a given notion, through a complete or exhaustive series of subordinate or coördinate notions. This utility of Division, in rendering our knowledge more complete, is, I find, stated by Aristotle,[1] though it has been overlooked by subsequent logicians. He observes that it is only by a regular division that we can be assured that nothing has been omitted in the definition of a thing.

As many kinds of Division possible as there are characters affording a Principle of Division.

"As it is by means of division that we discover what are the characters contained under the notion of an object, it follows that there must be as many kinds of division possible as there are characters contained under the notion of an object, which may afford the principle of a different division. If the characters which afford the principle of a division are only external and contingent, there is a division in the wider sense; if, again, they are internal and constant, there is a division in the stricter sense; if, finally, they are not only internal but also essential and original, there is a division in the strictest sense.

A universal notion the only object of Logical Division.

From the very conception of logical division, it is manifest that it can only be applied where the object to be divided is a universal notion, and that it is wholly inapplicable to an individual; for as the individual contains nothing under it, consequently it is not susceptible of an ulterior division. The general problem of which division affords the solution is, — To find the subordinate genera and species, the higher or generic notion being given. The higher notion is always something abstracted, — something generalized from the lower notions, with which it agrees, inasmuch as it contains all that is common to these inferior concepts, and from which it differs, inasmuch as they contain a greater number of determining characters. There thus subsists an internal connection between the higher and the lower concepts, and there is thus afforded a transition from the superior notion to the subordinate, and, consequently, an evolution of the lower notions from the higher. In

General problem of Division.

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[1] *Anal. Post.*, L. ii. c. 13.

order to discover the inferior genera and species, we have only to discover those characters which afford the proximate determinations, by which the sphere or extension of the higher notion is circumscribed. But to find what characters are wanted for the thorough-going determination of a higher notion, we must previously know what characters the higher notion actually contains, and this knowledge is only attainable by an analysis, — a sundering of the higher notion itself. In doing this, the several characters must be separately drawn forth and considered; and in regard to each, we must ascertain how far it must still be left undetermined, and how far it is capable of opposite determinations. But whether a character be still undetermined, and of what opposite determinations it is capable, — on these points it is impossible to decide *a priori*, but only *a posteriori*, through a knowledge of this particular character and its relations to other notions. And the accomplishment of this is rendered easier by two circumstances; — the one, that the generic notion is never altogether abstract, but always realized and held fast by some concrete form of imagination; — the other, that, in general, we are more or less acquainted with a greater or a smaller number of special notions, in which the generic notion is comprehended; and these are able to lead us either mediately or immediately to other subordinate concepts.

"But the determinations or constituent characters of a notion which we seek out, must not only be completely, but also precisely, opposed. Completely, inasmuch as all the species subordinate to the notions ought to be discovered; and precisely, inasmuch as whatever is not a subordinate species, ought to be absolutely excluded from the notion of the genus.

"In regard to the completeness of the opposition, it is not, however, required that the notion should be determined through every possible contradictory opposition; for those at least ought to be omitted, concerning whose existence or non-existence the notion itself decides. In regard to the opposition itself, it is not required that the division should be carried through by contradictory oppositions. The only opposition necessary is the reciprocal exclusion of the inferior notions into which the higher notion is divided."[1] In a mere logical relation, indeed, as we know nothing of the nature of a thing more than that a certain character either does or does not belong to it, a strictly logical division can only consist of two contradictory members, for example, — that angles are either *right* or *not right*, — that men are either *white* or *not white*. But looking to the real nature of the thing known, either *a priori* or *a posteri-*

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[1] Esser, *Logik*, § 136. — ED.

*ori*, the division may be not only dichotomous but polytomous, as for example, — *angles are right, or acute, or obtuse; men are white, or black, or copper-colored, or olive-colored*, etc.

Rules of Logical Division.

We now come, in the second place, to the rules dictated for Logical Division.

These Rules spring either, 1°, From the Principle of Division; or, 2°, From the Relations of the Dividing Members to the Divided Whole; or, 3°, From the Relations of the several Dividing Members to each other; or, 4°, From the relations of the Divisions to the Subdivisions.

Those springing, I. From the Principle of Division. First Rule.

The first of these heads — the Principle of Division — comprehends the three first rules. Of these the first is self-evident, — There must be some principle, some reason, for every division; for otherwise there would be no division determined, no division carried into effect.

Second.

In regard to the second rule, — That every division should have only a single principle, — the propriety of this is likewise sufficiently apparent. In every division we should depart from a definite thought, which has reference either to the notion as a unity, or to some single character. On the contrary, if we do not do this, but carry on the process by different principles, the series of notions in which the division is realized is not orderly and homogeneous, but heterogeneous and perplexed.

Third.

The Third rule, — That the principle of division should be an actual and essential character of the divided notion, — is not less manifest. "As the ground of division is that which principally regulates the correctness of the whole process, that is, the completeness and opposition of the division, — it follows that this ground must be of notoriety and importance, and accommodated to the end for the sake of which the division is instituted. Those characters of an object are best adapted for a division, whose own determinations exert the greatest influence on the determinations of other characters, and, consequently, on those of the notion itself; but such are manifestly not the external and contingent, but the internal and essential, characters, and, of these, those have the preëminence through whose determination the greater number of others are determined, or, what is the same thing, from which, as fundamental and original attributes, the greater number of the others are derived. The choice of character is, however, for the most part, regulated by some particular end; so that, under certain circumstances, external and contingent characters may obtain a preponderant importance. Such ends cannot, however, be enumerated. The character affording the principle of division must likewise be capable of being clearly and definitely brought out; for unless this be possible, we can have no distinct consciousness of the completeness and contrast of the determination of which it is susceptible. We ought, therefore, always to select those characters for principles of division, which are capable of a clear and distinct recognition."[1]

The second part of the rule, — That the division be not, therefore, too complex, and without a purpose, — is a corollary of the first. "In dividing, we may go on to infinity. For while, as was formerly shown, there is, in the series of higher and lower notions, no one which can be conceived as absolutely the lowest; so in subdividing, there is no necessary limit to the process. In like manner, the coördinations may be extended *ad infinitum*. For it is impossible to exhaust all the possible relations of notions, and each of these may be employed as the principle of a new division. Thus we can divide men by relation to their age, to their sex, to their color, to their stature, to their knowledge, to their riches, to their rank, to their manner of life, to their education, to their costume, etc., etc. It would, however, be ridiculous, and render the divisions wholly useless, if we multiplied them in this fashion without end. We, therefore, intentionally restrict them, that is, we make them comparatively limited, inasmuch as we only give them that completeness which is conducive to a certain end. In this manner, divisions become relatively useful, or acquire the virtue of adaptation. In the selection of a principle of division, we must take heed whether it be fertile and pertinent. A ground of division is fertile, when it affords a division out of which again other important consequences may be drawn; it is pertinent, when these consequences have a proximate relation to the end, on account of which we were originally induced to develop the extension of a concept. A principle of division may, therefore, be useful with one intent, and useless with another. *Soldiers*, for example, may be conveniently divided into *cavalry* and *infantry*, as this distinction has an important influence on their determination as soldiers. But in considering man in general and his relations, it would be ludicrous to divide men into *foot* and *horsemen*; while, on the contrary, their division would be here appropriate according to principles which in the former case would have been absurd. Seneca[2] says well, — 'Quicquid in majus crevit facilius agnoscitur, si discessit in partes; quas innumerabiles esse et parvas non oportet. Idem enim vitii habet nimia, quod nulla divisio. Simile confuso est, quicquid usque in pulverem sectum est.'"[1]

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[1] Esser, *Logik*, § 137. — ED

[2] *Epist.*, 90.

II. From the relations of the Dividing Members to the Divided Wholes. Fourth.

Under the second head, that is, as springing from the relations of the Dividing Members to the Divided Wholes, there are included the fourth and fifth laws. "As the notion and the notions into which it is divided stand to each other in the relation of whole and parts, and as the whole is greater than the part, the fourth rule is manifestly necessary, viz., That no dividing member of the predicate must by itself exhaust the subject. When this occurs, the division is vicious, or, more properly, there is no division. Thus the division of *man* into *rational animals* and *uncultivated nations*, would be a violation of this law.

Fifth.

"On the other hand, as the notions into which a notion is divided, stand to each other in the relation of constituting parts to a constituted whole, and as the whole is only the sum of all the parts, the necessity of the fifth rule is manifest, — That the dividing members of the predicate, taken together, must exhaust the subject. For if this does not take place, then the division of the principal notion has been only partial and imperfect. We transgress this law, in the first place, when we leave out one or more members of division; as for example. — *The actions of men are either good or bad*, — for to these we should have added *or indifferent*. And in the second place, we transgress it when we coördinate a subdivision with a division; as for example, — *Philosophy is either theoretical philosophy or moral philosophy:* here the proper opposition would have been *theoretical philosophy* and *practical philosophy*."[2] On the other hand, the dividing members, taken together, must not do more than exhaust the subject. The definition of the whole must apply to every one of its parts, but this condition is not fulfilled if there be a dividing member too much, that is, if there be a notion brought as a dividing member, which, however, does not stand in subordination to the divided whole. For example. — *Mathematical figures are either solids or surfaces* [*or lines or points*]. Here the last two members (*lines and points*) are redundant and erroneous, for lines and points, though the elements of mathematical figures, are not themselves figures.

Under the third head, as springing from the relations of the several Dividing Members to Each Other, there is a single law, — the sixth, — which enjoins, — That the dividing members be reciprocally exclusive.

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[1] Krug, *Logik*, § 126. Anm 4 — Ed.

[2] Esser, *Logik*, § 137. — Ed.

III. From the relations of the several Dividing Members to Each Other. Sixth.

"As a division does not present the same but the different determinations of a single notion (for otherwise one and the same determination would be presented twice), the dividing members must be so constituted that they are not mutually coincident, so that they either in whole or in part contain each other. This law is violated when, in the first place, a subdivision is placed above a division, as, — *Philosophy is either theoretical philosophy, or moral philosophy, or practical philosophy;* here *moral philosophy* falls into *practical philosophy* as a subordinate part; or when, in the second place, the same thing is divided in different points of view, as, — *Human actions are either necessary, or free, or useful, or detrimental.*"[1]

IV. From the relations of the Divisions to the Subdivisions. Seventh.

Under the fourth and last head, as arising from the relations of the Divisions to the Subdivisions, there is contained one law, the seventh, which prescribes, — That the divisions proceed continuously from immediate to mediate differences (*Divisio ne fiat per saltum vel hiatum*).

"As divisions originate in the character of a notion, capable of an opposite determination, receiving this determination, and as the subdivisions originate in these opposite determinations being themselves again capable of opposite determinations, in which gradual descent we may proceed indefinitely onwards, — from this it is evident, that the divisions should, as far as possible, be continuous, that is, the notion must first be divided into its proximate, and then into its remoter parts, and this without overleaping any one part; or in other words, each part must be immediately subordinated to its whole."[2] Thus, when some of the ancients divided *philosophy* into *rational, and natural, and moral*, the first and second members are merely subdivisions of *theoretical philosophy*, to which *moral* as *practical philosophy* is opposed. Sometimes, however, such a spring — such a *saltus* — is, for the sake of brevity, allowed; but this only under the express condition, that the omitted members are interpolated in thought. Thus, many mathematicians say, *angles are either right, or acute, or obtuse*, although, if the division were continuous, without hiatus, it would run, *angles are either right or oblique;* and *the oblique, again, either acute or obtuse.*

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[1] Esser, *Logik*, § 137. — Ed.

[2] Esser, *Logik*, § 137. — Ed.

# LECTURE XXVI.

## METHODOLOGY.

## SECTION II.—LOGICAL METHODOLOGY.

### III—DOCTRINE OF PROBATION.

Probation.

We now proceed to the Third Part of Pure Methodology, that which guides us to the third character or virtue of Perfect Thinking, — the Concatenation of Thought; — I mean Probation, or the Leading of Proof. I commence with the following paragraph.

**Par. LXXXVI. Probation, — its Nature and Elements.**

> ¶ LXXXVI. When there are propositions or judgments which are not intuitively manifest, and the truth of which is not admitted, then their validity can only be established when we evolve it, as an inference, from one or more judgments or propositions. This is called *Probation*, *Proving*, or the *Leading of Proof* (*probatio*, *argumentatio*, or *demonstratio*, in its wider sense). A Probation is thus a series of thoughts, in which a plurality of different judgments stand to each other, in respect of their validity, in the dependence of determining and determined, or of antecedents and consequents. In every Probation there are three things to be distinguished, — 1°. The Judgment to be proved, (*thesis*); 2°. The Ground or Principle of Proof, (*argumentum*); and, 3°. The Cogency of this principle to necessitate the connection of antecedents and consequents (*vis demonstrationis* or *nervus probandi*). From the nature of Probation, it is evident that Probation without inference is impossible; and that the Thesis to be proved and Principles of Proof stand to each other as conclusion and premises, with this difference, that, in Probation, there is a judgment (the thesis) expressly supposed, which, in the Syllogism, is not, at least necessarily, the case.[1]

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[1] Esser, *Logik*, § 138. Cf. Krug, *Logik*, § 127. — Ed. [Cf. Richter, *Über den Gegenstand und den Umfang der Logik*, § 32 *et seq.*]

Explication.
Terms employed.
Argumentation.
Argument.

In regard to the terms here employed, it is to be noticed that the term *argumentation* (*argumentatio*) is applied not only to a reasoning of many syllogisms, but likewise to a reasoning of one. The term *argument* (*argumentum*) in like manner is employed not only for the ground of a consecutive reasoning, but for the middle term of a single syllogism. But it is, moreover, vulgarly employed for the whole process of argumentation.[1]

Demonstration.

The term *demonstration* (*demonstratio*) is used in a looser and in a stricter signification. In the former sense, it is equivalent to *probation*, or *argumentation in general;* in the latter, to *necessary probation*, or *argumentation from intuitive principles.*

Leading of Proof of two sorts.

The expression *leading of proof* might, perhaps, be translated by the term *deduction*, but then this term must be of such a latitude as to include induction, to which it is commonly opposed; for Probation may be either a process of Deduction, that is, the leading of proof out of one higher or more general proposition, or a process of Induction, that is, the leading of proof out of a plurality of lower or less general judgments.

Probation in general.

How distinguished from Syllogism.

Whereon depends the logical value of a probation.

To prove, is to evince the truth of a proposition not admitted to be true, from other propositions the truth of which is already established. In every probation there are three things to be distinguished: — 1°. The Proposition to be proved, — the Thesis; 2°. The Grounds or Principle of Proof, — the Argument; and, 3°. The Degree of Cogency with which the thesis is inferred by the argumentum or argumenta, — the *vis* or *nervus probandi.* All probation is thus syllogistic; but all syllogism is not probative. The peculiarity of probation consists in this, — that it expressly supposes a certain given proposition, a certain thesis, to be true; to the establishment of this proposition the proof is relative; this proposition constitutes the conclusion of the syllogism, or series of syllogisms, of which the probation is made up; whereas, in the mere syllogistic process, this supposition is not necessarily involved. It is also evident that the logical value of a probation depends, 1°. On the truth of its principles or argumenta, 2°. On their connection with each other, and with the thesis or proposition to be proved, and, 3°. On the logical formality of the inference of the thesis from its argumenta. No proposition can be for another the principle of proof, which is not itself either immediately or mediately certain. A proposition is immediately certain, or evident at first hand, when, by the very nature of thought, we cannot but think it to be true, and when it, therefore, neither requires nor admits of proof. A proposition is mediately certain, or evident at second hand, when it is not at once and in itself thought as necessarily true, but when we are able to deduce it, with a consciousness of certainty, from a proposition which is evident at first hand. The former of these certainties is called *self-evident, intuitive, original, primary, ultimate*, etc., and the latter, *demonstrative, derivative, secondary*, etc.

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[1] See above, p. 196. — Ed.

Ground of Proof either Absolute or Relative.

According to this distinction, the Ground or Principle of Proof is either an absolute or a relative. Absolute, when it is an intuitive; relative, when it is a demonstrative proposition. That every proposition must ultimately rest on some intuitive truth, on some judgment at first hand, is manifest, if the fact of probation itself be admitted; for otherwise the regress would extend to infinity, and all probation, consequently, be impossible. When, for example, in the series of grounds H, G, F, E, D, C, B, there is no ultimate or primary A, and when, consequently, every A is only relatively, in respect of the consequent series, but not absolutely and in itself, first; — in this case, no sufficient and satisfactory probation is possible, for there always remains the question concerning a still higher principle. But positively to show that such primary judgments are actually given, is an exposition which, as purely metaphysical, lies beyond the sphere of Logic.[1]

Distinction of Propositions in respect of the general form of a system of Proof.

Theoretical and Practical.

To the general form of a system of Proof belong the following distinctions of propositions, to which I formerly alluded,[2] and which I may again recall to your remembrance. Propositions are either *Theoretical* or *Practical*. Practical, when they enounce the way in which it is possible to effectuate or produce something; Theoretical, when they simply enunciate a truth, without respect to the way in which this may be realized or produced.[3] A Theoretical proposition, if a primary or intuitive principle, is styled an *Axiom*. Examples of this are given in the four Fundamental Laws of Logic, and in the mathematical common notions —

Axiom.

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[1] Compare Esser, *Logik*, § 138 — Ed.

[2] See above, p. 187. — Ed.

[3] [Fries, *System der Logik*, § 73.]

*The whole is greater than its part,—If equals be added to equals, the wholes are equal*, etc. A Practical proposition, if a primary or intuitive principle, is styled a *Postulate.* Thus Geometry postulates the possibility of drawing lines,—of producing them *ad infinitum*, of describing circles, etc.

Postulate.

A Theoretical proposition, if mediate and demonstrable, is called a *Theorem.* This is laid down as a *Thesis*,—as a judgment to be proved,—and is proved from intuitive principles, theoretical and practical. A Practical proposition, if mediate and demonstrable, is called a *Problem.* In the probation, the Problem itself is first enounced; it is then shown in the solution how that which is required is to be done,—is to be effected; and, finally, in the proof, it is demonstrated that through this procedure the solution of the problem is obtained. For example, in the geometrical problem,—to describe an equilateral triangle on a given straight line,—there this problem is first stated; the solution then shows that, with this given line as a semi-diameter, we are to describe from each of its points of termination a circle; the two circles will intersect each other, and we are then, from the point of intersection, to draw straight lines to each point of termination; this being done, the proof finally demonstrates that these circles must intersect each other, that the drawn straight lines necessarily constitute a triangle, and that this triangle is necessarily equilateral.

Theorem

Problem.

*Corollaries* or *Consectaries* are propositions which, as flowing immediately as collateral results of others, require no separate proof. *Empeiremata* or *Empirical Judgments* are propositions, the validity of which reposes upon observation and experience. *Scholia* or *Comments* are propositions which serve only for illustration. *Lemmata* or *Sumptions* are propositions, borrowed either from a different part of the system we treat of, or from sciences other than that in which we now employ them. Finally, *Hypotheses* are propositions of two different significations. For, in the first place, the name is sometimes given to the arbitrary assumption or choice of one out of various means of accomplishing an end; when, for example, in the division of the periphery of the circle, we select the division into 360 degrees, or when, in Arithmetic, we select the decadic scheme of numeration. But, in the second place, the name of *hypothesis* is more emphatically given to provisory suppositions, which serve to explain the phenomena in so far as observed, but which are only asserted to be true, if ultimately

Corollaries. Empeiremata.

Scholia.
Lemmata.

Hypotheses.

confirmed by a complete induction. For example, the supposition of the Copernican solar system in Astronomy.[1]

Now these various kinds of propositions are mutually concatenated into system by the Leading of Proof, — by Probation.

So much for the character of this process in general. The paragraph already dictated contains a summary of the various particular characters by which Probations are distinguished. Before considering these in detail, I shall offer some preparatory observations.

The differences of Probations depend partly on their Matter and partly on their Form.

"The differences of Probations are dependent partly on their Matter, and partly on the Form in which they are expressed.

1. In respect of their Matter, Probations are Pure and Empirical.

2. In respect of their Form.

"In respect of the former ground of difference, — the Matter, — Probations are distinguished into Pure or *a priori*, and into Empirical or *a posteriori*, according as they are founded on principles which we must recognize as true, as constituting the necessary conditions of all experience, or which we do recognize as true, as particular results given by certain applications of experience. In respect of the latter ground of difference, — the Form, — Probations fall into various classes according to the difference of the form itself, which is either an External or an Internal.

(*a*) In relation to the Internal Form, Probations are Direct or Ostensive and Indirect or Apagogical.

Synthetic or Progressive and Analytic or Regressive.

"In relation to the Internal Form, probations are divided into Direct or Ostensive and into Indirect or Apagogical, according as they are drawn from the thing itself or from its opposite, in other words, according as the principles of probation are positive or are negative."[2] Under the same relation of Internal Form, they are also distinguished by reference to their order of procedure, — this order being either Essential or Accidental. The essential order of procedure regards the nature of the inference itself, as either from the whole to the part, or from the parts to the whole. The former constitutes Deductive Probation, the latter Inductive. The accidental order of procedure regards only our point of departure in considering a probation. If, commencing with the highest principle, we descend step by step to the conclusion, the process is Synthetic or Progressive; here the conclusion is evolved out of the principle. If, again, starting from the conclusion, we ascend step by step to the highest principle, the process is Analytic or Regressive; here the principle is evolved out of the conclusion.

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[1] Fries, *System der Logik*, § 73. Krug, *Logik*, §§ 67, 68.]

[2] Esser, *Logik*, § 141. — Ed.

(*b*) External Form Probations are Simple and Composite.

Regular and Irregular. Perfect and Imperfect.

In respect to the External Form, Probations are Simple or Monosyllogistic, if they consist of a single reasoning, Composite or Polysyllogistic if they consist of a plurality of reasonings. Under the same relation of external form, they are also divided into Regular and Irregular, into Perfect and Imperfect.

3. According to their degree of Cogency, Probations are Apodeictic and Probable.

Another division of Probations is by reference to their Cogency, or the Degree of Certainty with which their inference is drawn. But their cogency is of various degrees, and this either objectively considered, that is, as determined by the conditions of the proof itself, or subjectively considered, that is, by reference to those on whom the proof is calculated to operate conviction. In the former, or objective relation, probations are partly Apodeictic, or Demonstrative in the stricter sense of that term, — when the certainty they necessitate is absolute and complete, that is, when the opposite alternative involves a contradiction; partly Probable, — when they do not produce an invincible assurance, but when the evidence in favor of the conclusion preponderates over that which is opposed to it. In the latter or subjective relation, probations are either Universally Valid, when they are calculated to operate conviction on all reasonable minds, or Particularly Valid, when they are fitted to convince only certain individual minds.

Universally and Particularly Valid.

Par. LXXXVII. Probations, their Divisions.

¶ LXXXVII. Probations are divided by reference to their Matter, to their Form, and to their Degree of Cogency.

In relation to their Matter, they are partly *Pure* or *a priori*, partly *Empirical* or *a posteriori*.

As to their Form, — this is either Internal or External. In respect to their Internal Form, they are, 1°, By reference to the Manner of Inference, *Direct* or *Ostensive* (δεικτικαί, *ostensivæ*), and *Indirect* or *Apagogical* (*probationes apagogicæ reductiones ad absurdum*); 2°, By reference to their Essential or Internal Order of Procedure, they are either *Deductive* or *Inductive*; 3°, By reference to their Accidental or External Order of Procedure, they are partly *Synthetic* or *Progressive*, partly *Ana-*

> *lytic* or *Regressive*. In respect to their External Form, they are, 1°, *Simple* or *Monosyllogistic*, and *Composite* or *Polysyllogistic*; 2°, *Perfect* and *Imperfect*; 3°, *Regular* and *Irregular*.
>
> In respect to their Degree of Cogency, they are, 1°, As objectively considered, either *Apodeictic* or *Demonstrative* in the stricter signification of the term (ἀπόδειξεις, *demonstrationes stricte dictæ*), or *Probable* (*probationes sensu latiori*); 2°, As subjectively considered, they are either *Universally Valid* (κατ' ἀληθείαν, *secundum veritatem*), or *Particularly Valid* (κατ' ἄνθρωπον, *ad hominem*).[1]

Explication. Probations, 1. In respect of their Matter, are Pure and Empirical.

To speak now of these distinctions in detail. In the first place, "Probations," we have said, "in relation to their matter, are divided into Pure or *a priori*, and into Empirical or *a posteriori*. Pure or *a priori* proofs are those that rest on principles which, although rising into consciousness only on occasion of some external or internal observation, of some act of experience, are still native, are still original, contributions of the mind itself, and a contribution without which no act of experience becomes possible. Proofs again are called *Empirical* or *a posteriori*, if they rest on principles which are exclusively formed from experience or observation, and whose validity is cognizable in no other way than that of experience or observation. When the principles of Probation are such as are not contingently given by experience, but spontaneously engendered by the mind itself, these principles are always characterized by the qualities of necessity and universality; consequently, a proof supported by them is elevated altogether above the possibility of doubt. When, on the other hand, the Principles of Probation are such as have only the guarantee of observation and experience for their truth, — (supposing even that the observation be correct and the experience stable and constant), — these principles, and, consequently, the probation founded on them, can pretend neither to necessity nor universality; seeing that what produces the observation or experience has only a relation to individual objects, and is only competent to inform us of what now is, but not of what always is, of what necessarily must be. Although, however, these empirical principles are impressed with the character neither of necessity nor of universality, they play a very important part in the theatre of human thought."[2]

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[1] Cf. Krug, *Logik*, §§ 128, 129, 130, 131, 132. Esser, *Logik*, § 139. — Ed. [Cf. Degerando. *Des Signes*, t. iv. ch. 7, p. 234.]

[2] Esser, *Logik*, § 140. — Ed.

This distinction of Proofs, by reference to the matter of our knowledge, is one, indeed, which Logic does not take into account. Logic, in fact, considers every inference of a consequent from an antecedent as an inference *a priori*, supposing even that the antecedents themselves are only of an empirical character. Thus we may say, that, from the general relations of distance found to hold between the planets, Kant and Olbers proved *a priori* that between Mars and Jupiter a planetary body must exist, before Ceres, Pallas, Juno, and Vesta, were actually discovered.[1] Here, however, the *a priori* principle is in reality only an empirical rule, — only a generalization from experience. But with the manner in which these empirical rules — (Bacon would call them *axioms*) — are themselves discovered or evolved — with this, Pure Logic has no concern. This will fall to be considered in Modified Logic, when we treat of the concrete Doctrine of Induction and Analogy.

This distinction of Probations not taken into account by Logic.

In the second place, "in respect of their Form, and that the Internal, Probations are, as we said, first of all, divided into Direct or Ostensive, and into Indirect or Apagogical. A proof is Direct or Ostensive, when it evinces the truth of a thesis through positive principles, that is, immediately; it is Indirect or Apagogical, when it evinces the truth of a thesis through the falsehood of its opposite, that is, mediately. The indirect is specially called the *apagogical* (*argumentatio apagogica* sive *deductio ad impossibile*), because it shows that something cannot be admitted, since, if admitted, consequences would necessarily follow impossible or absurd. The Indirect or Apagogical mode of proof is established on the principle, that that must be conceded to be true whose contradictory opposite contains within itself a contradiction. This principle manifestly rests on the Law of Contradiction, and on the Law of Excluded Middle; for what involves a contradiction it is impossible for us to think, and if a character must be denied of an object, — and that it must be so denied the probation has to show, — then the contradictory opposite of that character is of necessity to be affirmed of that object. The Direct mode of probation has undoubtedly this advantage over the Indirect, — that it not only furnishes the sought-for truth, but also truly develops its necessary connection with its ultimate principles; whereas the Indirect demonstrates only the repugnance of some proposition with certain

2. In respect of their Form, — (a) Direct and Indirect.

Principle of Indirect Proof.

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[1] See Kant's *Vorlesungen über Physische Geographie*, 1802; *Werke*, vi. p. 449. — ED.

truths, without, however, positively evincing the truth of its opposite, and thereby obtaining for it a full and satisfactory recognition. It is, therefore, usually employed only to constrain a troublesome opponent to silence, by a display of the absurdities which are implied in, and which would flow out of, his assertions. Nevertheless, the indirect probation establishes the proposition to be proved not less certainly than the direct; nay, it still more precisely excludes the supposition of the opposite alternative, and, consequently, affords an intenser consciousness of necessity. We ought, however, to be on our guard against the paralogisms to which it is peculiarly exposed, by taking care — 1°, That the opposites are contradictory and not contrary; and 2°, That an absurdity really is, and not merely appears to be. The differences of Apagogical Probations correspond to the different kinds of propositions which may be indirectly demonstrated; and these are, in their widest generality, either Categorical, or Hypothetical, or Disjunctive. Is the thesis a categorical proposition? Its contradictory opposite is supposed, and from this counter proposition conclusions are deduced, until we obtain one of so absurd a character, that we are able to argue back to the falsehood of the original proposition itself. Again, is the thesis an hypothetical judgment? The contradictory opposite of the consequent is assumed, and the same process to the same end is performed as in the case of a categorical proposition. Finally, is the thesis a disjunctive proposition? In that case, if its *membra disjuncta* are contradictorily opposed, we cannot, either directly or indirectly, prove it false as a whole; all that we can do being to show that one of these disjunct members cannot be affirmed of the subject, from which it necessarily follows that the other must."[1]

Differences of Indirect or Apagogical Probations.

Under the Internal Form, Probations are, in the second place, in respect of their Essential or Internal Order of procedure, either Deductive or Inductive, according as the thesis is proved by a process of reasoning descending from generals to particulars and individuals, or by a process of reasoning ascending from individuals and particulars to generals. On this subject it is not necessary to say anything, as the rules which govern the formal inference in these processes have been already stated in the Doctrine of Syllogisms; and the consideration of Induction, as modified by the general conditions of the matter to which it is applied, can only be treated of when, in the sequel, we come to Modified or Concrete Methodology.

(b) Deductive and Inductive

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[1] Esser, *Logik*, § 142. — Ed.

(c) Synthetic and Analytic.

"Under the Internal Form, Probations are, however, in the third place, in respect of their External or Accidental Order of procedure, Synthetic or Progressive, and Analytic or Regressive. A probation is called *synthetic* or *progressive*, when the conclusion is evolved out of the principles, — *analytic* or *regressive*, when the principles are evolved out of the conclusion. In the former case, the probation goes from the subject to the predicate; in the latter case, from the predicate to the subject. Where the probation is complex, — if synthetic, the conclusion of the preceding syllogism is the subsumption of that following; if analytic, the conclusion of the preceding syllogism is the sumption of that following. In respect of certainty, both procedures are equal, and each has its peculiar advantages; in consequence of which the combination of these two modes of proof is highly expedient. But the Analytic Procedure is often competent where the Synthetic is not; whereas the Synthetic is never possible where the Analytic is not, and this is never possible where we have not a requisite stock of propositions already verified. When the Probation is partly analytic, partly synthetic, it is called *Mixed*."[1]

Par. LXXXVIII. Formal Legitimacy of a Probation, — its Rules.

¶ LXXXVIII. The Formal Legitimacy of a Probation is determined by the following rules.

1°, Nothing is to be begged, borrowed, or stolen; that is, nothing is to be presupposed as proved, which itself requires a demonstration. The violation of this rule affords the vice called the *Petitio principii*, or *Fallacia quæsiti medii* (τὸ ἐν ἀρχῇ αἰτεῖσθαι).[2]

2°, No proposition is to be employed as a principle of proof, the truth of which is only to be evinced as a consequence of the proposition which it is employed to prove. The violation of this rule is the vice called ὕστερον πρότερον.

3°, No circular probation is to be made; that is, the proposition which we propose to prove must not be used as a principle for its own probation. The violation of this rule is called the *Orbis vel circulus in demonstrando*, — *diallelus*, — ὁ δι' ἀλλήλων τρόπος.[3]

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[1] Esser, *Logik*, § 142. — Ed

[2] [On error of this term, see Pacius, *Commentarius in Org* ] [*In Anal. Prior* ii. 16. "Non est petitio τῆς ἀρχῆς, id est, principii, vel ἐν τῇ ἀρχῇ, id est, in principio; sed τοῦ ἐν ἀρχῇ προκειμένου, id est, ejus problematis, quod initio fuit propositum et in disquisitionem vocatum." *Ibid.* ii. 24. — Ed.]

[3] See Sextus Empiricus, *Pyrrh. Hyp.*, i. 169. ii. 68. Laertius, L. ix. §§ 88, 89. [Cf. Facciolati, *Acroasis*, v. p. 69 *et seq.*]

4°, No leap, no hiatus, must be made; that is, the syllogisms of which the probation is made up must stand in immediate or continuous connection. From the transgression of this rule results the vice called the *Saltus* vel *Hiatus in demonstrando*.

5°, The scope of the probation is not to be changed; that is, nothing is to be proved other than what it was proposed to prove. The violation of this rule gives the *Heterozetesis*, *Ignoratio* vel *Mutatio elenchi*, and the *Transitus in aliud genus* vel *a genere ad genus*, — μετάβασις εἰς ἄλλο γένος.[1]

These rules reduced to two.

In this paragraph, I have given, as different rules, those canons which are opposed to vices not absolutely identical, and which have obtained different denominations. But you must observe, that the first three rules are all manifestly only various modifications — only special cases, — of one general law. To this law, likewise, the fourth rule may with perfect propriety be reduced, for the *saltus* or *hiatus in probando* is, in fact, no less the assumption of a proposition as a principle of probation which itself requires proof, than either the *petitio principii*, the *hysteron proteron*, or the *circulus in probando*. These five laws, therefore, and the correspondent vices, may all be reduced to two; one of which regards the means, — the principles of proof; the other the end, — the proposition to be proved. The former of these laws prescribes, — That no proposition be employed as a principle of probation which stands itself in want of proof; the latter, — That nothing else be proved than the proposition for whose proof the probation was instituted. You may, therefore, add to the last paragraph the following supplement:

Par. LXXXIX Rules of Probation reduced to two.

¶ LXXXIX. These rules of the logicians may, however, all be reduced to two.

1°, That no proposition be employed as a Principle of Probation which stands itself in need of proof.

2°, That nothing else be proved than the Proposition for whose proof the Probation was instituted.

Explication.

Of these two, the former comprehends the first four rules of the logicians, — the latter the fifth. I shall now, therefore, proceed to illustrate the five rules in detail.

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[1] [See Reinhold, *Die Logik oder die allgemeine Denkformenlehre*, § 150, p. 407. Jena, 1827.] [Cf. Krug, *Logik*, § 133. Esser, *Logik*, § 144. — ED.]

First Rule.

The First Rule — Nothing is to be begged, borrowed, or stolen; that is, nothing is to be presupposed as proved, which itself requires a demonstration, — is, in fact, an enunciation of the first general rule I gave you, and to this, therefore, as we shall see, the second, third, and fourth are to be reduced as special applications. But, in considering this law in its universality, it is not to be understood as if every probation were at once to be rejected as worthless, in which anything is presupposed and not proved. Were this its sense, it would be necessary in every probation to ascend to the highest principles of human knowledge, and these themselves, as immediate and, consequently, incapable of proof, might be rejected as unproved assumptions. Were this the meaning of the law, there could be no probation whatever. But it is not to be understood in this extreme rigor. That probation alone is a violation of this law, and, consequently, alone is vicious, in which a proposition is assumed as a principle of proof, which may be doubted on the ground on which the thesis itself is doubted, and where, therefore, we prove the uncertain by the equally uncertain. The probation must, therefore, depart from such principles as are either immediately given as ultimate, or mediately admit of a proof from other sources than the proposition itself in question. When, for example, it was argued that the Newtonian theory is false, which holds colors to be the result of a diversity of parts in light, on the ground, admitted by the ancients, that the celestial bodies, and, consequently, their emanations, consist of homogeneous elements; — this reasoning was inept, for the principle of proof was not admitted by modern philosophers. Thus, when Aristotle defends the institution of slavery as a natural law, on the ground that the barbarians, as of inferior intellects, are the born bondsmen of the Greeks, and the Greeks, as of superior intellect, the born masters of the barbarians[1] — (an argument which has, likewise, been employed in modern times in the British Parliament, with the substitution of negroes for barbarians, and whites for Greeks), — this argument is invalid, as assuming what is not admitted by the opponents of slavery. It would be a *petitio principii* to prove to the Mohammedan the divinity of Christ from texts in the New Testament, for he does not admit the authority of the Bible; but it would be a valid *argumentum ad hominem* to prove to him from the Koran the prophetic mission of Jesus, for the authority of the Koran he acknowledges.

Limitation under which this Rule is to be understood.

The Second Rule, That no proposition is to be employed as a

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[1] *Polit.*, i. 2. — Ed.

Second Rule.

principle of proof, the truth of which is only to be evinced as a consequence of the proposition which it is employed to prove, — is only a special case of the preceding. For example, if we were to argue that man is a free agent, on the ground that he is morally responsible for his actions, or that his actions can be imputed to him, or on the ground that vice and virtue are absolutely different, — in these cases, the *hysteron proteron* is committed; for only on the ground that the human will is free, can man be viewed as a morally responsible agent, and his actions be imputed to him, or can the discrimination of vice and virtue, as more than a merely accidental relation, be maintained. But we must pause before we reject a reasoning on the ground of *hysteron proteron*; for the reasoning may still be valid, though this logical fault be committed. Nay, it is frequently necessary for us to reason by such a regress. In the very example given, if we be unable to prove directly that the will of man is free, but are able to prove that he is a moral agent, responsible for his actions, as subjected to the voluntary but unconditioned Law of Duty, and if the fact of this law of duty and its unqualified obligation involve, as a postulate, an emancipation from necessity, — in that case, no competent objection can be taken to this process of reasoning. This, in fact, is Kant's argument. From what he calls the *categorical imperative*, that is, from the fact of the unconditioned law of duty as obligatory on man, he postulates, as conditions, the liberty of the human will, and the existence of a God, as the moral governor of a moral universe.[1]

Third Rule.

The Third Law, — That no circular probation is to be made, that is, the proposition which we propose to prove must not be used as a principle for its own probation, — this, in like manner, is only a particular case of the first. "To the Circle there are required properly two probations, which are so reciprocally related that the antecedent in the one is proved by its own consequent in the other. The proposition A is true because the proposition B is true; and the proposition B is true because the proposition A is true. A circle so palpable as this would indeed be committed by no one. The vice is usually concealed by the interpolation of intermediate propositions, or by a change in the expression."[2] Thus Plato, in his *Phædo*,[3] demonstrates the immortality of the soul from its simplicity; and, in the *Republic*,[4] he demonstrates its simplicity from its immortality.

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[1] *Kritik der reinen Vernunft*, Methodenlehre, Hauptst. ii. Abschn. 2. *Kritik der praktischen Vernunft*, p. 274, ed. Rosenkranz. — Ed.

[2] Krug, *Logik*, § 133. Anm. 3. — Ed.

[3] P. 78. — Ed.

[4] B. x. p. 611. — Ed.

Regressive and Progressive Proofs not to be confounded with the tautological Circle.

In relation to the Hysteron Proteron and the Circle, I must observe that these present some peculiar difficulties for the systematic arrangement of our knowledge. Through the Circle (the result of which is only the proof of an assertion), — through the circle by itself, nothing whatever is gained for the logical development of our knowledge. But we must take care not to confound the connection of Regressive and Progressive Proofs with the tautological Circle. When, in the treatment of a science out of the observed facts, we wish to generalize universal laws, we lead, in the first place, an inductive probation, that (ὅτι) certain laws there are. Having assured ourselves of the existence of these laws by this regressive process, we then place them in theory at the head of a progressive or synthetic probation, in which the facts again recur, reversed and illustrated from the laws, which, in the antecedent process, they had been employed to establish; that is, it is now shown why (διότι) these facts exist.

Fourth Rule.

The Fourth Rule, — No leap, no gap, must be made, that is, the syllogisms of which the probation is made up must stand in immediate or continuous connection, — may be, likewise, reduced to the first. For here the only vice is that, by an ellipsis of an intermediate link in the syllogistic chain, we use a proposition which is actually without its proof, and it is only because this proposition is as yet unproved, that its employment is illegitimate. The *Saltus* is, therefore, only a special case of the *Petitio*.

The *Saltus in demonstrando*.

The *Saltus* is committed when the middle term of one of the syllogisms in a probation is not stated. If the middle term be too manifest to require statement, then is the *saltus* not to be blamed, for it is committed only in the expression and not in the thought. If the middle term be not easy of discovery, then the *saltus* is a fault; but if there be no middle term to be found, then the *saltus* is a vice which invalidates the whole remainder of the probation. The proper *saltus*, — the real violation of this law, is, therefore, when we make a transition from one proposition to another, the two not being connected together as reason and consequent.[1] The (vulgar) Enthymeme and the Sorites do not, therefore, it is evident, involve violations of this law.

The Fifth Rule, — The scope of the probation is not to be changed, that is, nothing is to be proved other than what was proposed to be proved, corresponds to the second of the two rules which I gave, and of which it is only a less explicit statement. It evidently admits of three kinds or degrees. In the first case, the proposition to be proved is changed by the change of its subject or predicate into different notions. Again, the proposition may substantially remain the same, but may be changed into one either of a wider or of a narrower extension, — the second and third cases.

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[1] Cf. Krug, *Logik*, § 133. Anm. 4. — Ed.

Fifth Rule Admits of three degrees.

The first of these cases is the *Mutatio Elenchi*, or *Transitus ad aliud genus*, properly so called. "When a probation does not demonstrate what it ought to demonstrate, it may, if considered absolutely or in itself, be valid; but if considered relatively to the proposition which it behooves us to prove, it is of no value. We commute by this procedure the whole scope or purport of the probation; we desert the proper object of inquiry, — the point in question. If a person would prove the existence of ghosts, and to this end prove by witness the fact of unusual noises and appearances during the night, he would prove something very different from what he proposed to establish; for this would be admitted without difficulty by those who still denied the apparition of ghosts; it, therefore, behooved him to show that the unusual phenomena were those of a spirit good or bad."[1]

First Degree, — *Mutatio Elenchi.*

The two other cases, — when the proposition actually proved is either of a smaller or of a greater extension than the proposition which ought to have been proved, — are not necessarily, like the preceding, altogether irrelevant. They are, however, compared together, of various degrees of relevancy. In the former case, where too little is proved, — here the end proposed is, to a certain extent at least, changed, and the probation results in something different from what it was intended to accomplish. For example, if we propose to prove that Sempronius is a virtuous character, and only prove the legality of his actions, we here prove something less than, something different from, what we professed to do; for we proposed to prove the internal morality, and not merely the external lawfulness, of his conduct. Such a proof is not absolutely invalid; it is not even relatively null, for the external legality is always a concomitant of internal morality. But the existence of the latter is not evinced by that of the former, for Sempronius

Second Degree, — in which too little is proved may conform his actions to the law from expediency and not from duty.[1]

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[1] Krug, *Logik*, § 133. Anm. 2. — Ed.

Third Degree, — in which too much is proved.

In the other case, in which there is proved too much, the probation is lawful, and only not adequate and precise. For example, if we propose to prove that the soul does not perish with the body, and actually prove that its dissolution is absolutely impossible, — here the proof is only superabundant. The logical rule, — *Qui nimium probat, nihil probat*, is, therefore, in its universal, or unqualified expression, incorrect. The proving too much is, however, often the sign of a saltus having been committed. For example, — when a religious enthusiast argues from the strength of his persuasion, that he is, therefore, actuated by the Holy Spirit, and his views of religion consequently true, — there is here too much proved, for there is implied the antecedent, omitted by a saltus, that whoever is strongly persuaded of his inspiration is really inspired, — a proposition too manifestly absurd to bear an explicit enouncement. In this case, the apparent too much is in reality a too much which, when closely examined, resolves itself into a nothing.[2]

We have thus terminated the consideration of Pure or Abstract Logic, in both its Parts, and now enter on the Doctrine of Modified or Concrete Logic.

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[1] Cf. Krug, *Logik*, § 133. Anm. 5. — ED.

[2] [Cf. Sigwart. *Handbuch zu Vorlesungen uber die Logik*, § 407, p. 252.]

# LECTURE XXVII.

## MODIFIED LOGIC.

## PART I.—MODIFIED STOICHEIOLOGY.

### SECTION I.—DOCTRINE OF TRUTH AND ERROR.

### TRUTH.—ITS CHARACTER AND KINDS.

Modified Logic,—its object.

Its problems,—reduced to three.

Having now terminated the Doctrine of Pure or Abstract Logic, we proceed to that of Modified or Concrete Logic. In entering on this subject, I have to recall to your memory what has formerly been stated in regard to the object which Modified Logic proposes for consideration. Pure Logic takes into account only the necessary conditions of thought, as founded on the nature of the thinking process itself. Modified Logic, on the contrary, considers the conditions to which thought is subject, arising from the empirical circumstances, external and internal, under which exclusively it is the will of our Creator that man should manifest his faculty of thinking. Pure Logic is thus exclusively conversant with the form; Modified Logic is, likewise, occupied with the matter, of thought. And as their objects are different, so, likewise, must be their ends. The end of Pure Logic is formal truth,—the harmony of thought with thought; the end of Modified Logic is the harmony of thought with existence. Of these ends, that which Pure Logic proposes is less ambitious, but it is fully and certainly accomplished; the end which Modified Logic proposes is higher, but it is far less perfectly attained. The problems which Modified Logic has to solve may be reduced to three: 1°, What is Truth and its contradictory opposite,—Error? 2°, What are the Causes of Error, and the Impediments to Truth, by which man is beset in the employment of his faculties, and what are the Means of their Removal? And, 3°, What are the Subsidiaries by which Human Thought may be strengthened and guided in the exercise of its functions?

From this statement it is evident that Concrete Logic might, like Pure Logic, have been divided into a Stoicheiology and a Methodology, — the former comprising the first two heads, — the latter the third. For if to Modified Stoicheiology we refer the consideration of the nature of concrete truth and error, and of the conditions of a merely not erroneous employment of thought, — this will be exhausted in the First and Second Chapters; whereas, if we refer to Methodology a consideration of the means of employing thought not merely without error, but with a certain positive perfection, — this is what the Third Chapter professes to expound.

And distributed between its Stoicheiology and its Methodology.

I commence the First Chapter, which proposes to answer the question, — What is Truth? with its correlatives, — by the dictation of the following paragraph:

¶ XC. The end which all our scientific efforts are exerted to accomplish, is *Truth* and *Certainty*. Truth is the correspondence or agreement of a cognition with its object; its Criterion is the necessity determined by the laws which govern our faculties of knowledge; and Certainty is the consciousness of this necessity.[1] Certainty, or the conscious necessity of knowledge, absolutely excludes the admission of any opposite supposition. Where such appears admissible, doubt and uncertainty arise. If we consider truth by relation to the degree and kind of Certainty, we have to distinguish *Knowledge*, *Belief*, and *Opinion*. Knowledge and Belief differ not only in degree, but in kind. Knowledge is a certainty founded upon insight; Belief is a certainty founded upon feeling. The one is perspicuous and objective; the other is obscure and subjective. Each, however, supposes the other; and an assurance is said to be a knowledge or a belief, according as the one element or the other preponderates. Opinion is the admission of something as true, where, however, neither insight nor feeling is so intense as to necessitate a perfect certainty. What prevents the admission of a proposition as certain is called *Doubt*. The approximation of the imperfect certainty of opinion to the perfect certainty of knowledge or belief is called *Probability*.

Par. XC. Truth and Certainty, — what.

If we consider Truth with reference to Knowledge, and to the way in which this knowledge arises, we must distinguish

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[1] Cf. Twesten, *Die Logik, insbesondere die Analytik*, § 306. — ED.

*Empirical* or *a posteriori*, from *Pure* or *a priori Truth*. The former has reference to cognitions which have their source in the presentations of Perception, External and Internal, and which obtain their form by the elaboration of the Understanding or Faculty of Relations (διάνοια). The latter is contained in the necessary and universal cognitions afforded by the Regulative Faculty — Intellect Proper — or Common Sense (νοῦς).

Explication

This paragraph, after stating that Truth and Certainty constitute the end of all our endeavors after knowledge, for only in the attainment of truth and certainty can we possibly attain to knowledge or science ; — I say, after the statement of this manifest proposition, — it proceeds to define what is meant by the two terms *Truth* and *Certainty;* and, to commence with the former, — Truth is defined, the correspondence or agreement of a cognition or cognitive act of thought with its object.

Truth, — what.

The question — What is Truth ? is an old and celebrated problem. It was proposed by the Roman Governor — by Pontius Pilate — to our Saviour ; and it is a question which still recurs, and is still keenly agitated in the most recent schools of Philosophy. In one respect, all are nearly agreed in regard to the definition of the term, for all admit that by truth is understood a harmony, — an agreement, a correspondence between our thought and that which we think about. This definition of truth we owe to the schoolmen. "Veritas intellectus," says Aquinas, "est adæquatio intellectus et rei, secundum quod intellectus dicit esse, quod est, vel non esse, quod non est."[1] From the schoolmen, this definition has been handed down to modern philosophers, by whom it is currently employed, without, in general, a suspicion of its origin. It is not, therefore, in regard to the meaning of the term *truth*, that there is any difference of opinion among philosophers. The questions which have provoked discussion, and which remain, as heretofore, without a definitive solution, are not whether truth be the harmony of thought and reality, but whether this harmony, or truth, be attainable, and whether we possess any criterion by which we can be assured of its attainment. Considering, however, at present only the meaning of the term, philosophers have divided Truth (or the harmony of thought and its object) into different

Definition of the term.

Questions in debate regarding Truth.

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[1] [*Contra Gentiles*, lib. i. c. 59. See Biunde, *Über Wahrheit im Erkennen*, p. 11. On Truth in general, see Ruiz, *Comment. de Scientia, de Ideis de Veritate*, etc. Disp. lxxxv., p. 871 *et seq.*]

species, to which they have given diverse names; but they are at one neither in the division nor in the nomenclature.

For man only two kinds of Truth, — Formal and Real.

It is plain that for man there can only be conceived two kinds of Truth, because there are for human thought only two species of object. For that about which we think must either be a thought, or something which a thought contains. On this is founded the distinction of Formal Knowledge and Real Knowledge, — of Formal Truth and Real Truth. Of these in their order.

I. Formal Truth.

I. In regard to the former, a thought abstracted from what it contains, that is, from its matter or what it is conversant about, is the mere form of thought. The knowledge of the form of thought is a formal knowledge, and the harmony of thought with the form of thought is, consequently, Formal Truth. Now Formal Knowledge is of two kinds; for it regards either the conditions of the Elaborative Faculty, — the Faculty of Thought Proper, — or the conditions of our Presentations or Representations of external things, that is, the intuitions of Space and Time. The former of these sciences is Pure Logic, — the science which considers the laws to which the Understanding is astricted in its elaborative operations, without inquiring what is the object, — what is the matter, to which these operations are applied. The latter of these sciences is Mathematics, or the science of Quantity, which considers the relations of Time and Space, without inquiring whether there be any actual reality in space or time. Formal truth will, therefore, be of two kinds, — Logical and Mathematical. Logical truth is the harmony or agreement of our thoughts with themselves as thoughts, in other words, the correspondence of thought with the universal laws of thinking. These laws are the object of Pure or General Logic, and in these it places the criterion of truth. This criterion is, however, only the negative condition — only the *conditio sine qua non*, of truth. Logical truth is supposed in supposing the possibility of thought; for all thought presents a combination, the elements of which are repugnant or congruent, but which cannot be repugnant and congruent at the same time. Logic might be true, although we possessed no truth beyond its fundamental laws; although we knew nothing of any real existence beyond the formal hypothesis of its possibility.

Formal Truth of two kinds, Logical and Mathematical.

Logical Truth.

But were the Laws of Logic purely subjective, that is, were they true only for our thought alone, and without any objective validity, all human sciences (and Mathematics among the rest) would be purely subjective likewise; for we are cognizant of objects only under the forms and rules of which Logic is the scientific development. If the true character of objective validity be universality, the laws of Logic are really of that character, for these laws constrain us, by their own authority, to regard them as the universal laws not only of human thought, but of universal reason.

Mathematical Truth

The case is the same with the other formal science, the science of Quantity, or Mathematics. Without inquiring into the reality of existences, and without borrowing from or attributing to them anything, Arithmetic, the science of Discrete Quantity, creates its numbers, and Geometry, the science of Continuous Quantity, creates its figures; and both operate upon these their objects in absolute independence of all external actuality. The two mathematical sciences are dependent for their several objects only on the notion of time and the notion of space, — notions under which alone matter can be conceived as possible, for all matter supposes space, and all matter is moved in space and in time. But to the notions of space and time the existence or non-existence of matter is indifferent; indifferent, consequently, to Geometry and Arithmetic, so long at least as they remain in the lofty regions of pure speculation, and do not descend to the practical application of their principles. If matter had no existence, nay, if space and time existed only in our minds, mathematics would still be true; but their truth would be of a purely formal and ideal character, — would furnish us with no knowledge of objective realities.[1]

So much for Formal Truth, under its two species of Logical and Mathematical.

II. Real Truth.

Real and Formal Sciences.

The other genus of truth — (the end which the Real Sciences propose) — is the harmony between a thought and its matter. The Real Sciences are those which have a determinate reality for their object, and which are conversant about existences other than the forms of thought. The Formal Sciences have a superior certainty to the real; for they are simply ideal combinations, and they construct their objects without inquiring about their objective reality. The real sciences are sciences of fact, for the point from which they depart is always a fact, — always a presentation. Some of these rest on the presentations of Self-consciousness, or the facts of mind; others on the presentations of Sensitive Perception, or the facts of nature. The former are the

Under the Real Sciences are included the Mental and Material.

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[1] Cf. Esser, *Logik*, § 172. — Ed. [Fries, *Logik*, § 124.]

Mental Sciences, the latter the Material. The facts of mind are given partly as contingent, partly as necessary; the latter — the necessary facts — are universal virtually and in themselves; the former — the contingent facts — only obtain a fictitious universality by a process of generalization. The facts of nature, however necessary in themselves, are given to us only as contingent and isolated phænomena; they have, therefore, only that conditional, that empirical, generality, which we bestow on them by classification.

How can we know that there is a correspondence between our thought and its object?

Real truth is, therefore, the correspondence of our thoughts with the existences which constitute their objects. But here a difficulty arises; — How can we know that there is, that there can be, such a correspondence? All that we know of the objects is through the presentations of our faculties; but whether these present the objects as they are in themselves, we can never ascertain, for to do this it would be requisite to go out of ourselves, — out of our faculties, — to obtain a knowledge of the objects by other faculties, and thus to compare our old presentations with our new. But all this, even were the supposition possible, would be incompetent to afford us the certainty required. For were it possible to leave our old, and to obtain a new, set of faculties, by which to test the old, still the veracity of these new faculties would be equally obnoxious to doubt as the veracity of the old. For what guarantee could we obtain for the credibility in the one case, which we do not already possess in the other? The new faculties could only assert their own truth; but this is done by the old; and it is impossible to imagine any presentations of the non-ego by any finite intelligence, to which a doubt might not be raised, whether these presentations were not merely subjective modifications of the conscious ego itself. All that could be said in answer to such a doubt is, that if such were true, our whole nature is a lie, — a supposition which is not, without the strongest evidence, to be admitted; and the argument is as competent against the skeptic in our present condition, as it would be were we endowed with any other conceivable form of Acquisitive and Cognitive Faculties. But I am here trenching on what ought to be reserved for an explanation of the Criterion of Truth.

Real Truth, — its subdivisions.

Such, as it appears to me, is the only rational division of Truth according to the different character of the objects to which thought is relative, — into Formal and into Real Truth. Formal Truth, as we have seen, is subdivided into Logical and into Mathematical. Real Truth might likewise be subdivided, were this requisite, into various species. For example, Metaphysical Truth might denote the harmony of thought with the necessary facts of mind; Psychological Truth, the harmony of thought with the contingent facts of mind; and Physical Truth, the harmony of thought with the phænomena of external experience.

Metaphysical.
Psychological.
Physical

Various applications of the term *Truth*.

It now remains to say a word in regard to the confusion which has been introduced into this subject, by the groundless distinctions and contradictions of philosophers. Some have absurdly given the name of *truth* to the mere reality of existence, altogether abstracted from any conception or judgment relative to it, in any intelligence human or divine. In this sense *physical truth* has been used to denote the actual existence of a thing. Some have given the name of *metaphysical truth* to the congruence of the thing with its idea in the mind of the Creator. Others again have bestowed the name of *metaphysical truth* on the mere logical possibility of being thought; while they have denominated by *logical truth* the metaphysical or physical correspondence of thought with its objects. Finally, the term *moral* or *ethical truth* has been given to veracity, or the correspondence of thought with its expression. In this last case, truth is not, as in the others, employed in relation to thought and its object, but to thought and its enouncement. So much for the notion, and the principal distinctions of Truth.

The Criterion of Truth.

But, returning to the paragraph, I take the next clause, which is, — "The Criterion of truth is the necessity determined by the laws which govern our faculties of knowledge; and the consciousness of this necessity is certainty." That the necessity of a cognition, that is, the impossibility of thinking it other than as it is presented, — that this necessity, as founded on the laws of thought, is the criterion of truth, is shown by the circumstance that where such necessity is found, all doubt in regard to the correspondence of the cognitive thought and its object must vanish; for to doubt whether what we necessarily think in a certain manner, actually exists as we conceive it, is nothing less than an endeavor to think the necessary as the not necessary or the impossible, which is contradictory.

What has just been said also illustrates the truth of the next sentence of the paragraph, — viz., "Certainty or the conscious necessity of a cognition absolutely excludes the admission of any opposite supposition. When such is found to be admissible, doubt and uncertainty arise." This sentence requiring no explanation, I proceed to the next — viz., "If we consider truth by relation to the degree and kind of Certainty, we have to distinguish Knowledge, Belief, and Opinion. Knowledge and Belief differ not only in degree but in kind. Knowledge is a certainty founded on intuition. Belief is a certainty founded upon feeling. The one is perspicuous and objective, the other is obscure and subjective. Each, however, supposes the other, and an assurance is said to be a knowledge or a belief, according as the one element or the other preponderates."

Knowledge and Belief, — their difference.

That the certainty of all knowledge is ultimately resolvable into a certainty of Belief, maintained by Luther.

In reference to this passage, it is necessary to say something in regard to the difference of Knowledge and Belief. In common language the word *Belief* is often used to denote an inferior degree of certainty. We may, however, be equally certain of what we believe as of what we know, and it has, not without ground, been maintained by many philosophers, both in ancient and in modern times, that the certainty of all knowledge is, in its ultimate analysis, resolved into a certainty of belief. "All things," says Luther, "stand in a belief, in a faith, which we can neither see nor comprehend. The man who would make these visible, manifest, and comprehensible, has vexation and heart-grief for his reward. May the Lord increase Belief in you and in others."[1] But you may perhaps think that the saying of Luther is to be taken theologically, and that, philosophically considered, all belief ought to be founded on knowledge, not all knowledge in belief. But the same doctrine is held even by those philosophers who are the least disposed to mysticism or blind faith.

Aristotle.

Among these Aristotle stands distinguished. He defines science, strictly so called, or the knowledge of indubitable truths, merely by the intensity of our conviction or subjective assurance;[2] and on a primary and incomprehensible belief he hangs the whole chain of our comprehensible or mediate knowledge. The doctrine which has been called *The Philosophy of Common Sense*, is the doctrine which founds all our knowledge on belief; and, though this has not been signalized, the doctrine of Common Sense is perhaps better stated by the Stagirite than by any succeeding thinker. "What," he says, "appears to all men, that we affirm to be, and he who rejects this belief (πίστις) will assuredly advance nothing better worthy of credit." This passage is from his *Nicomachean Ethics*.[3] But, in his Physical Treatises, he founds in belief the knowledge we have of the reality of motion,

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[1] *Weisheit*, Th. iii. Abth. 2. Quoted by Sir W Hamilton, *Reid's Works*, p. 778. — Ed.

[2] Various passages from Aristotle to this effect are cited by the Author, *Reid's Works*, p. 771 — Ed.

[3] B. x. c. 2. — Ed.

The Platonists. Proclus

Hume

and by this, as a source of knowledge paramount to the Understanding, he supersedes the contradictions which are involved in our conception of motion, and which had so acutely been evolved by the Eleatic Zeno, in order to show that motion was impossible.[1] In like manner, in his Logical Treatises, Aristotle shows that the primary or ultimate principles of knowledge must be incomprehensible; for if comprehensible, they must be comprehended in some higher notion, and this again, if not itself incomprehensible, must be again comprehended in a still higher, and so on in a progress *ad infinitum*, which is absurd.[2] But what is given as an ultimate and incomprehensible principle of knowledge, is given as a fact, the existence of which we must admit, but the reasons of whose existence we cannot know, — we cannot understand. But such an admission, as it is not a knowledge, must be a belief; and thus it is that, according to Aristotle, all our knowledge is in its root a blind, a passive faith, in other words, a feeling. The same doctrine was subsequently held by many of the acutest thinkers of ancient times, more especially among the Platonists; and of these Proclus is perhaps the philosopher in whose works the doctrine is turned to the best account.[3] In modern times we may trace it in silent operation, though not explicitly proclaimed, or placed as the foundation of a system. It is found spontaneously recognized even by those who might be supposed the least likely to acknowledge it without compulsion. Hume, for example, against whose philosophy the doctrine of Common Sense was systematically arrayed, himself pointed out the weapons by which his adversaries subsequently assailed his skepticism; for he himself was possessed of too much philosophical acuteness not to perceive that the root of knowledge is belief. Thus, in his *Inquiry*, he says — "It seems evident that men are carried by a natural instinct or prepossession to repose faith in their senses: and that, without any reasoning, or even almost before the use of reason, we always suppose an external universe which depends not on our preception, but would exist though we and every sensible creature were absent or annihilated. Even the animal creation are governed by a like opinion, and preserve this belief, — the belief of external objects, in all their thoughts, designs, and actions. . . . . This very table, which we see white, and which we feel hard, is believed to exist independent of our perception, and to be something external to our mind which perceives it."[1]

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[1] B. viii. c. 8. See *Reid's Works*, p. 773. — Ed.

[2] *Metaphys.*, iii. (iv.) 4. Cf. *Anal. Post.*, i. 2, 3 — Ed

[3] *In Platonis Theologiam*, i. c. 25. Quoted in *Reid's Works*, p. 776. — Ed.

The manifestation of Belief involves Knowledge.

But, on the other hand, the manifestation of this belief necessarily involves knowledge; for we cannot believe without some consciousness or knowledge of the belief, and, consequently, without some consciousness or knowledge of the object of the belief. Now, the immediate consciousness of an object is called an *intuition*, — an *insight*. It is thus impossible to separate belief and knowledge, — feeling and intuition. They each suppose the other.

Intuition, — what.

The question as to the relation of Belief and Knowledge properly metaphysical.

The consideration, however, of the relation of Belief and Knowledge does not properly belong to Logic, except in so far as it is necessary to explain the nature of Truth and Error. It is altogether a metaphysical discussion; and one of the most difficult problems of which Metaphysics attempts the solution.

The remainder of the paragraph contains the statement of certain distinctions and the definition of certain terms, which it was necessary to signalize, but which do not require any commentary for their illustration. The only part that might have required an explanation is the distinction of Truth into Pure, or *a priori*, and into Empirical, or *a posteriori*. The explanation of this division has been already given more than once in the course of the Lectures,[2] but the following may now be added.

Pure and Empirical Truth.

Experience presents to us only individual objects, and as these individual objects might or might not have come within our sphere of observation, our whole knowledge of and from these objects might or might not exist; — it is merely accidental or contingent. But as our knowledge of individual objects affords the possibility, as supplying the whole contents, of our generalized or abstracted notions, our generalized or abstracted notions are, consequently, not more necessary to thought, than the particular observations out of which they are constructed. For example, every horse I have seen I might not have seen; and I feel no more necessity to think the reality of a horse than the reality of a hippogriff; I can, therefore, easily annihilate in thought the existence of the whole species. I can suppose it not to be, — not to have been. The case is the same with every other notion which is mediately or immediately the datum of observation. We can think away each and every part of the knowledge we have derived from experience; our whole empirical knowledge is, therefore, a merely accidental possession of the mind.

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[1] *Inquiry concerning the Human Understanding*, sect. 12. *Philosophical Works*, iv. p. 177 — ED.

[2] See above, *Lectures on Metaphysics*, p. 403 *et seq.* Cf. Esser, *Logik*, §§ 4, 171. — ED. [Fries, *Logik*, § 124.]

But there are notions in the mind of a very different character, — notions which we cannot but think, if we think at all. These, therefore, are notions necessary to the mind; and, as necessary, they cannot be the product of experience. For example, I perceive something to begin to be. I feel no necessity to think that this thing must be at all, but thinking it existent, I cannot but think that it has a cause. The notion, or rather the judgment, of Cause and Effect, is, therefore, necessary to the mind. If so, it cannot be derived from experience.

# LECTURE XXVIII.

## MODIFIED STOICHEIOLOGY.

### SECTION I. — DOCTRINE OF TRUTH AND ERROR.

### SECTION II. — ERROR, — ITS CAUSES AND REMEDIES.

### A. — GENERAL CIRCUMSTANCES — SOCIETY.

I NOW proceed to the consideration of the opposite of Truth, — Error, and, on this subject, give you the following paragraph:

Par. XCI. Error, — its character and sources.

> ¶ XCI. Error is opposed to Truth; and Error arises, 1°, From the commutation of what is Subjective with what is Objective in thought; 2°, From the Contradiction of a supposed knowledge with its Laws; or, 3°, From a want of Adequate Activity in our Cognitive Faculties.
>
> Error is to be discriminated from *Ignorance* and from *Illusion;* these, however, along with Arbitrary Assumption, afford the most frequent occasions of error.[1]

Explication.

This paragraph consists of two parts, and these I shall successively consider. The first is: 'Error is opposed to truth; and Error arises, 1°, From the commutation of what is subjective with what is objective in thought; 2°, From the contradiction of a supposed knowledge with its laws; or, 3°, From a want of adequate activity in our cognitive faculties.'

Error, — what

"In the first place, we have seen that Truth is the agreement of a thought with its object. Now, as Error is the opposite of truth, — Error must necessarily consist in a want of this agreement. In the second place, it has been shown that the criterion or standard of truth is the necessity founded on the laws of our cognitive faculties; and from this it follows that the essential character of error must be, either that it is not founded on these laws, or that it is repugnant to them. But these two alternatives may be viewed as only one; for inasmuch as, in the former case, the judgment remains undecided, and can make no pretence to certainty, it may be thrown out of account no less than in the latter, where, as positively contradictory of the laws of knowledge, it is necessarily false.

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[1] Twesten, *Die Logik, insbesondere die Analytik*, §§ 308, 309. — Ed. [Cf. Ruiz, *Commentarius de Scientia*, etc. Disp. xcii. p. 925.]

As Material.

Of these statements the first, that is, the non-agreement of a notion with its object, is error viewed on its material side; and as a notion is the common product, — the joint result afforded by the reciprocal action of object and subject, it is evident that whatever the notion contains not correspondent to the object, must be a contribution by the thinking subject alone, and we are thus warranted in saying that Material Error consists in the commuting of what is subjective with what is objective in thought; in other words, in mistaking an ideal illusion for a real representation.

As Formal.

The second of these statements, that is, the incongruence of the supposed cognition with the laws of knowledge, is error viewed on its formal side. Now here the question at once presents itself, — How can an act of cognition contradict its own laws? The answer is that it cannot; and error,

Arises from the want of adequate activity of the Cognitive Faculties.

when more closely scrutinized, is found not so much to consist in the contradictory activity of our cognitive faculties as in their want of activity. And this may be in consequence of one or other of two causes. For it may arise from some other mental power, — the will, for example, superseding, — taking the place of, the defective cognition, or, by its intenser force, turning it aside and leading it to a false result; or it may arise from some want of relative perfection in the object, so that the cognitive faculty is not determined by it to the requisite degree of action.

"What is actually thought, cannot but be correctly thought. Error first commences when thinking is remitted, and can in fact only gain admission in virtue of the truth which it contains; — every error is a perverted truth. Hence Descartes[1] is justified in the establishment of the principle, — that we would never admit the false for the true, if we would only give assent to what we clearly and distinctly apprehend. 'Nihil nos unquam falsum pro vero admissuros, si tantum iis assensum præbeamus, quæ clare et distincte percipimus.'"[1] In this view the saying of the Roman poet —

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[1] *Principia Philosophiæ*, i. 43. Cf. *Med.* iv. *De Vero et Falso.*

> "Nam neque decipitur ratio, nec decipit unquam,"[2]

— is no longer a paradox; for the condition of error is not the activity of intelligence, but its inactivity.

So much for the first part of the paragraph. The second is —

Error discriminated from Ignorance and Illusion.

'Error is to be discriminated from Ignorance and from Illusion, which, however, along with Arbitrary Assumption, afford the usual occasions of Error.'

Ignorance.

"Ignorance is a mere negation, — a mere not-knowledge; whereas in error there lies a positive pretence to knowledge. Hence a representation, be it imperfect, be it even without any correspondent objective reality, is not in itself an error. The imagination of a hippogriff is not in itself false; the Orlando Furioso is not a tissue of errors. Error only arises when we attribute to the creations of our minds some real object, by an assertory judgment; we do not err and deceive either ourselves or others, when we hold and enounce a subjective or problematic supposition only for what it is. Ignorance, — not knowledge, — however, leads to error, when we either regard the unknown as non-existent, or when we falsely fill it up. The latter is, however, as much the result of Will, of arbitrary assumption, as of ignorance; and, frequently, it is the result of both together. In general, the will has no inconsiderable share in the activity by which knowledge is realized. The will has not immediately an influence on our judgment, but mediately it has. Attention is an act of volition, and attention furnishes to the Understanding the elements of its decision. The will determines whether we shall carry on our investigations, or break them off, content with the first apparent probability; and whether we shall apply our observations to all, or, only partially, to certain, momenta of determination.

Illusion.

"The occasions of Error which lie in those qualities of Presentation, Representation, and Thought arising from the conditions and influences of the thinking subject itself, are called *Illusions*. But the existence of illusion does not necessarily imply the existence of error. Illusion becomes error only when we attribute to it objective truth; whereas illusion is no error when we regard the fallacious appearance as a mere subjective affection. In the jaundice, we see everything tinged with yellow, in consequence of the suffusion of the eye with bile. In

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[1] Twesten, *Logik*, § 308. — ED.

[2] Manilius, ii. 131 — ED.

Its sources.

this case, the yellow vision is illusion; and it would become error, were we to suppose that the objects we perceive were really so colored. All the powers which coöperate to the formation of our judgments, may become the sources of illusion, and, consequently, the occasions of error. The Senses,[1] the Presentative Faculties, External and Internal, the Representative, the Retentive, the Reproductive, and the Elaborative. Faculties, are immediate, the Feelings and the Desires are mediate, sources of illusion. To these must be added the Faculty of Signs, in all its actual manifestations in language. Hence we speak of sensible, psychological, moral, and symbolical, illusion."[2] In all these relations the causes of illusion are partly general, partly particular; and though they proximately manifest themselves in some one or other of these forms, they may ultimately be found contained in the circumstances by which the mental character of the individual is conformed. Taking, therefore, a general view of all the possible Sources of Error, I think they may be reduced to the following classes, which, as they constitute the heads and determine the order of the ensuing discussion, I shall comprise in the following paragraph, with which commences the consideration of the Second Chapter of Modified Logic. Before, however, proceeding to consider these several classes in their order, I may observe that Bacon is the first philosopher who attempted a systematic enumeration of the various sources of error;[3] and his quaint classification of these, under the significant name of *idols*, into the four genera of Idols of the Tribe (*idola tribus*), Idols of the Den (*idola specus*), Idols of the Forum (*idola fori*), which may mean either the market-place, the bar, or the place of public assembly, and Idols of the Theatre (*idola theatri*), he thus briefly characterizes.

Bacon's classification of the sources of error.

Par. XCII. Error,—its sources.

¶ XCII. The Causes and Occasions of Error are comprehended in one or other of the four following classes. For they are found either, 1°, In the General Circumstances which modify the intellectual character of the individual; or, 2°, In the

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[1] La Fontaine. See Mazure, *Cours de Philosophie*, ii 241 [Toutes les sciences naturelles ne sont autre chose qu'une guerre ouverte de la raison contre les déceptions de la sensibilité. . . . . . c'est a dire, qu'elles ont pour objet de réformer les erreurs de nos sens, et de substituer les réalités de la science aux apparences factices que nos sens nous suggèrent. C'est ce que La Fontaine a très bien exprimé dans les vers suivant:

> "Quand l'eau courbe un bâton, ma raison le redresse," etc. — ED.

[2] [Twesten, *Logik*, § 309, pp. 288. 289. Cf Sigwatt, *Logik*, §§ 484, 485.]

[3] *Novum Organum*, i. Aph. xxxix. — ED.

Constitution, Habits, and Reciprocal Relations of his powers of Cognition, Feeling, and Desire; or, 3°, In the Language which he employs, as an Instrument of Thought and a Medium of Communication; or, 4°, In the nature of the Objects themselves, about which his knowledge is conversant.

Par. XCIII. I. General circumstances which modify the character of the individual.

¶ XCIII. Under the General Circumstances which modify the character of the individual, are comprehended, 1°. The particular degree of Cultivation to which his nation has attained; for its rudeness, the partiality of its civilization, and its over-refinement are all manifold occasions of error; and this cultivation is expressed not merely in the state of the arts and sciences, but in the degree of its religious, political, and social advancement; 2°. The Stricter Associations, in so far as these tend to limit the freedom of thought, and to give it a one-sided direction; such are Schools, Sects, Orders, Exclusive Societies, Corporations, Castes, etc.[1]

Explication. Man by nature social, and influenced by the opinions of his fellows.

In the commencement of the Course, I had occasion to allude to the tendency there is in man to assimilate in opinions and habits of thought to those with whom he lives.[2] Man is by nature, not merely by accidental necessity, a social being. For only in society does he find the conditions which his different faculties require for their due development and application. But society, in all its forms and degrees, from a family to a State, is only possible under the condition of a certain harmony of sentiment among its members; and as man is by nature destined to a social existence, he is by nature determined to that analogy of thought and feeling which society supposes, and out of which society springs. There is thus in every association, great and small, a certain gravitation of opinions towards a common centre. As in our natural body every part has a necessary sympathy with every other, and all together form, by their harmonious conspiration, a healthy whole; so, in the social body, there is always a strong predisposition in each of its members to act and think in unison with the rest. This universal sympathy or fellow-feeling is the principle of the different spirit dominant in different ages, countries, ranks, sexes, and periods of life. It is the cause why fashions, why political and religious enthusiasm, why moral example either for good or evil, spread so rapidly and exert so powerful an influence. As men are naturally prone to imitate others, they, consequently, regard as important or insignificant, as honorable or disgraceful, as true or false, as good or bad, what those around them consider in the same light.[1]

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[1] Bachmann, *Logik*, §§ 402, 403. — ED.

[2] See *Lectures on Metaphysics*, p. 59. — ED.

Pascal quoted on the power of custom.

Of the various testimonies I formerly quoted, of the strong assimilating influence of man on man, and of the power of custom to make that appear true, natural, and necessary, which in reality is false, unnatural, and only accidentally suitable, I shall only adduce that of Pascal. "In the just and the unjust," says he, "we find hardly anything which does not change its character in changing its climate. Three degrees of an elevation of the pole reverses the whole of jurisprudence. A meridian is decisive of truth, and a few years, of possession. Fundamental laws change. Right has its epochs. A pleasant justice which a river or a mountain limits! Truth on this side the Pyrenees, error on the other!"[2] It is the remark of an ingenious philosopher, "that if we take a survey of the universe, all nations will be found admiring only the reflection of their own qualities, and contemning in others whatever is contrary to what they are accustomed to meet with among themselves. Here is the Englishman accusing the French of frivolity; and here the Frenchman reproaching the Englishman with selfishness and brutality. Here is the Arab persuaded of the infallibility of his Caliph, and deriding the Tartar who believes in the immortality of the Grand Lama. In every nation we find the same congratulation of their own wisdom, and the same contempt of that of their neighbors.

"Were there a sage sent down to earth from heaven, who regulated his conduct by the dictates of pure reason alone, this sage would be universally regarded as a fool. He would be, as Socrates says, like a physician accused by the pastry-cooks, before a tribunal of children, of prohibiting the eating of tarts and cheese-cakes; a crime undoubtedly of the highest magnitude in the eyes of his judges. In vain would this sage support his opinions by the clearest arguments, — the most irrefragable demonstrations; the whole world would be for him like the nation of hunchbacks, among whom, as the Indian fabulists relate, there once upon a time appeared a god, young, beautiful, and of consummate symmetry. This god, they add, entered the capital; he was there forthwith surrounded by a crowd of natives; his figure appeared to them extraordinary; laughter, hooting, and taunts manifested their astonishment, and they were about to carry their outrages still further, had not one of the inhabitants (who had undoubtedly seen other men), in order to snatch him from the danger, suddenly cried out — 'My friends! my friends! What are we going to do? Let us not insult this miserable monstrosity. If heaven has bestowed on us the general gift of beauty, — if it has adorned our backs with a mount of flesh, let us with pious gratitude repair to the temple and render our acknowledgment to the immortal gods.'" This fable is the history of human vanity. Every nation admires its own defects, and contemns the opposite qualities in its neighbors. To succeed in a country, one must be a bearer of the national hump of the people among whom he sojourns.

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[1] [Meiners, *Untersuchungen über die Denkkräfte unde Willenskrafte des Menschen*, ii. 322.]

[2] *Pensées*, partie i. art. vi. § 8 (vol. ii. p 126, ed Faugere). Comp. *Lect. on Metaphysics*, p. 60

The art of doubting well difficult to teach and to learn.

There are few philosophers who undertake to make their countrymen aware of the ridiculous figure they cut in the eye of reason; and still fewer the nations who are able to profit by the advice. All are so punctiliously attached to the interests of their vanity, that none obtain in any country the name of wise, except those who are fools of the common folly. There is no opinion too absurd not to find nations ready to believe it, and individuals prompt to be its executioners or its martyrs. Hence it is that the philosopher declared, that if he held all truths shut up within his hand, he would take especial care not to show them to his fellowmen. In fact, if the discovery of a single truth dragged Galileo to the prison, to what punishment would he not be doomed who should discover all? Among those who now ridicule the folly of the human intellect, and are indignant at the persecution of Galileo, there are few who would not, in the age of that philosopher, have clamored for his death. They would then have been imbued with different opinions; and opinions not more passively adopted than those which they at present vaunt as liberal and enlightened. To learn to doubt of our opinions, it is sufficient to examine the powers of the human intellect, to survey the circumstances by which it is affected, and to study the history of human follies. Yet in modern Europe six centuries elapsed from the foundation of Universities until the appearance of that extraordinary man, — I mean Descartes, — whom his age first persecuted, and then almost worshipped as a demi-god, for initiating men in the art of doubting, — of doubting well, — a lesson at which, however, both their skepticism and credulity show that, after two centuries, they are still but awkward scholars. Socrates was wont to say — "All that I know is that I know nothing."[1] In our age it would seem that men know everything except what Socrates knew. Our errors would not be so frequent were we less ignorant; and our ignorance more curable, did we not believe ourselves to be all-wise.

Thus it is that the influence of Society, both in its general form of a State or Nation, and in its particular forms of Schools, Sects, etc., determines a multitude of opinions in its members, which, as they are passively received, so they are often altogether erroneous.

Two general forms of the influence of example.

1. Prejudice in favor of the Old.

Prepared by Education

Among the more general and influential of these there are two, which, though apparently contrary, are, however, both, in reality, founded on the same incapacity of independent thought, — on the same influence of example, — I mean the excessive admiration of the Old, and the excessive admiration of the New. The former of these prejudices,[2] — under which may be reduced the prejudice in favor of Authority, — was at one time prevalent to an extent of which it is difficult for us to form a conception. This prejudice is prepared by the very education not only which we do, but which we all must receive. The child necessarily learns everything at first on credit, — he believes upon authority. But when the rule of authority is once established, the habit of passive acquiescence and belief is formed, and, once formed, it is not again always easily thrown off. When the child has grown up to an age in which he might employ his own reason, he has acquired a large stock of ideas; but who can calculate the number of errors which this stock contains? and by what means is he able to discriminate the true from the false? His mind has been formed to obedience and uninquiry; he possesses no criterion by which to judge; it is painful to suspect what has been long venerated, and it is felt even as a kind of personal mutilation to tear up what has become irradicated in his intellectual and moral being. *Ponere difficile est quæ placuere diu.* The adult does not, therefore, often judge for himself more than the child; and the tyranny of authority and foregone opinion continues to exert a sway during the whole course of his life. In our infancy and childhood the credit accorded to our parents and instructors is implicit; and if what we have learned from them be confirmed by what we hear from others, the opinions thus recommended become at length stamped in almost indelible characters upon the mind. This is the cause why men so rarely abandon the opinions which vulgarly pass current; and why what comes as new is by so many, for its very novelty, rejected as false. And hence it is, as already noticed, that truth is as it were geographically and politically distributed; what is truth on one side of a boundary being error and absurdity on the other. What has now been said of the influence of society at large, is true also of the lesser societies which it contains, all of which impose with a stronger or feebler, a wider or more contracted, authority, certain received opinions upon the faith of the members. Hence it is that whatever has once obtained a recognition in any society, large or small, is not rejected when the reasons on which it was originally admitted have been proved erroneous. It continues, even for the reason that it is old and has been accepted, to be accepted still; and the title which was originally defective, becomes valid by continuance and prescription.

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[1] Plato, *Apol.*, p 23. — ED.

[2] [On Prejudice in general see the following works: — Dumarsais, *Essai sur les Préjugés*, new ed, Paris, 1822. *Examen de l' Essai sur les Préjuges*, Berl. 1777. *Essai sur les Prejuges*, Neuchatel, 1796. J. B. Sulpnes, *Des Erreurs et des Préjugés répandus dans la Societé*, Paris, 1810–1813, 3 vols. 8vo. J. L. Castillon, *Essai sur les Erreurs et les superstitions Anciennes et Modernes*, Amsterdam. 1765; Paris, 1767. Sir Thomas Brown, *Vulgar Errors*. Glanvil, *Essays.*]

2. Prejudice in favor of the New.

But opposed to this cause of error, from the prejudice in favor of the Old, there is the other, directly the reverse, — the prejudice in favor of the New. This prejudice may be, in part at least, the result of sympathy and fellow-feeling. This is the cause why new opinions, however erroneous, if they once obtain a certain number of converts, often spread with a rapidity and to an extent, which, after their futility has been ultimately shown, can only be explained on the principle of a kind of intellectual contagion. But the principal cause of the prejudice in favor of novelty lies in the Passions, and the consideration of these does not belong to the class of causes with which we are at present occupied.

Prejudice of Learned Authority.

Connected with and composed of both these prejudices, — that in favor of the old and that in favor of the new, — there is the prejudice of Learned Authority; for this is usually associated with the prejudices of Schools and Sects. "As often as men have appeared, who, by the force of their genius, have opened up new views of science, and thus contributed to the progress of human intellect, so often have they, likewise, afforded the occasion of checking its advancement, and of turning it from the straight path of improvement. Not that this result is to be imputed as a reproach to them, but simply because it is of the nature of man to be so affected. The views which influenced these men of genius, and which, consequently, lie at the foundation of their works, are rarely comprehended in their totality by those who have the names of these authors most frequently in their mouths. The many do not concern themselves to seize the ideal which a philosopher contemplated, and of which his actual works are only the imperfect representations; they appropriate to themselves only some of his detached apothegms and propositions, and of these compound, as they best can, a sort of system suited to their understanding, and which they employ as a talisman in their controversies with others. As their reason is thus a captive to authority, and, therefore, unable to exert its native freedom, they, consequently, catch up the true and the false without discrimination, and remain always at the point of progress where they had been placed by their leaders. In their hands a system of living truths becomes a mere petrified organism; and they require that the whole science shall become as dead and as cold as their own idol. Such was Plato's doctrine in the hands of the Platonists; such was Aristotle's philosophy in the hands of the Schoolmen; and the history of modern systems affords equally the same result."[1]

So much for the first genus into which the Sources of Error are divided.

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[1] Bachmann, *Logik*, § 404, p. 550. — Ed.

# LECTURE XXIX.

## MODIFIED STOICHEIOLOGY.

### SECTION II.—ERROR—ITS CAUSES AND REMEDIES

### A.—GENERAL CIRCUMSTANCES—SOCIETY.

### B.—AS IN POWERS OF COGNITION, FEELING, AND DESIRE.

### I.—AFFECTIONS—PRECIPITANCY—SLOTH—HOPE AND FEAR—SELF-LOVE.

Recapitulation.

In our last Lecture, we entered on the consideration of the various sources of Error. These, I stated, may be conveniently reduced to four heads, and consist, 1°. In the General Circumstances which modify the intellectual character of the individual; 2°. In the Constitution, Habits, and Reciprocal Relations of his powers of Cognition, Feeling, and Desire; 3°. In the Language which he employs as an Instrument of Thought and a Medium of Communication; and, 4°. In the nature of the Objects themselves about which his knowledge is conversant.

Of these, I then gave you a general view of the nature of those occasions of Error, which originate in the circumstances under the influence of which the character and opinions of man are determined for him as a member of society. Under this head I stated, that, as man is destined by his Creator to fulfil the end of his existence in society, he is wisely furnished with a disposition to imitate those among whom his lot is cast, and thus conform himself to whatever section of human society he may by birth belong, or of which he may afterwards become a member. The education we receive, nay the very possibility of receiving education at all, supposes to a certain extent the passive infusion of foreign and traditionary opinions. For as man is compelled to think much earlier than he is able to think for himself,—all education necessarily imposes on him many opinions which, whether in themselves true or false, are, in reference to the recipient, only prejudices; and it is even only a small number of mankind who at a later period are able to bring these obtruded opinions to the test of reason, and by a free exercise of their own intelligence to reject them if found false, or to acknowledge them if proved true.

But while the mass of mankind thus remain, during their whole lives, only the creatures of the accidental circumstances which have concurred to form for them their habits and beliefs; the few who are at last able to form opinions for themselves, are still dependent, in a great measure, on the unreasoning judgment of the many. Public opinion, hereditary custom, despotically impose on us the capricious laws of propriety and manners. The individual may possibly, in matters of science, emancipate himself from their servitude; in the affairs of life he must quietly submit himself to the yoke. The only freedom he can here prudently manifest, is to resign himself with a consciousness that he is a slave not to reason but to conventional accident. And while he conforms himself to the usages of his own society, he will be tolerant to those of others. In this respect his maxim will be that of the Scythian prince: "With you such may be the custom, — with us it is different."

Means by which the influence of society, as a source of error, may be counteracted

So much for the general nature of the influence to which we are exposed from the circumstances of Society; it now remains to say what are the means by which this influence, as a source of error, may be counteracted.

Necessary to institute a critical examination of the contents of our knowledge.

It has been seen that, in consequence of the manner in which our opinions are formed for us by the accidents of society, our imposed and supposed knowledge is a confused medley of truths and errors. Here it is evidently necessary to institute a critical examination of the contents of this knowledge. Descartes proposes that, in order to discriminate, among our prejudiced opinions, the truths from the errors, we ought to commence by doubting all.[1] This has exposed him to much obloquy and clamor, but most unjustly. The doctrine of Descartes has nothing skeptical or offensive; for he only maintains that it behooves us to examine all that has been inculcated on us from infancy, and under the masters to whose authority we have been subjected, with the same attention and circumspection which we accord to dubious questions. In fact there is nothing in the precept of Descartes, which had not been previously enjoined by other philosophers.

Descartes, — his precept.

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[1] *Discours de la Méthode*, Partie ii. — ED.

Of these I formerly quoted to you several, and among others the remarkable testimonies of Aristotle, St. Augustin, and Lord Bacon.[1]

Conditions which modify its application.

But although there be nothing reprehensible in the precept of Descartes, as enounced by him, it is of less practical utility in consequence of no account being taken of the circumstances which condition and modify its application. For, in the first place, the judgments to be examined ought not to be taken at random, but selected on a principle, and arranged in due order and dependence. But this requires no ordinary ability, and the distribution of things into their proper classes is one of the last and most difficult fruits of philosophy. In the second place, there are among our prejudices, or pretended cognitions, a great many hasty conclusions, the investigation of which requires much profound thought, skill, and acquired knowledge. Now, from both of these considerations, it is evident that to commence philosophy by such a review, it is necessary for a man to be a philosopher before he can attempt to become one. The precept of Descartes is, therefore, either unreasonable, or it is too unconditionally expressed. And this latter alternative is true.

A gradual and progressive abrogation of prejudices all that can be required of the student of philosophy.

What can be rationally required of the student of philosophy, is not a preliminary and absolute, but a gradual and progressive abrogation, of prejudices. It can only be required of him, that, when, in the course of his study of philosophy, he meets with a proposition which has not been already sufficiently sifted, — (whether it has been elaborated as a principle or admitted as a conclusion), — he should pause, discuss it without prepossession, and lay aside for future consideration all that has not been subjected to a searching scrutiny. The precept of Descartes, when rightly explained, corresponds to that of St. Paul:[2] "If any man among you seemeth to be wise in this world, let him become a fool, that he may be wise;" that is, let him not rely more on the opinions in which he has been brought up, and in favor of which he and those around him are prejudiced, than on so many visions of imagination; and let him examine them with the same circumspection as if he were assured that they contain some truth among much falsehood and many extravagances.[3]

Proceeding now to the second class of the Sources of Error, which are found in the Mind itself, I shall commence with the following paragraph:

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[1] See *Lect. on Metaphysics*, p. 63 *et seq.* — ED.

[2] 1 Cor. iii 18.

[3] This criticism of the precept of Descartes is, with some slight changes, taken from Crousaz, *Logique*, t. iii., part ii., ch 6, p. 263 *et seq.* — ED.

Par. XCIV. II. Source of Error arising from the powers of Cognition, Feeling, and Desire, — of two kinds.

¶ XCIV. The Sources of Error which arise from the Constitution, Habits, and Reciprocal Relations of the powers of Cognition, Feeling, and Desire, may be subdivided into two kinds. The first of these consists in the undue preponderance of the Affective Elements of mind (the Desires and Feelings) over the Cognitive; the second, in the weakness or inordinate strength of some one or other of the Cognitive Faculties themselves.

Explication. 1. Preponderance of Affection over Cognition

Affection is that state of mind in which the Feelings and Desires exert an influence not under the control of reason; in other words, a tendency by which the intellect is impeded in its endeavor to think an object as that object really is, and compelled to think it in conformity with some view prescribed by the passion or private interest of the subject thinking.

Influence of Passion on the Mind.

The human mind, when unruffled by passion, may be compared to a calm sea. A calm sea is a clear mirror, in which the sun and clouds, in which the forms of heaven and earth, are reflected back precisely as they are presented. But let a wind arise, and the smooth, clear surface of the water is lifted into billows and agitated into foam. It no more reflects the sun and clouds, the forms of heaven and earth, or it reflects them only as distorted and broken images. In like manner, the tranquil mind receives and reflects the world without as it truly is; but let the wind of passion blow, and every object is represented, not as it exists, but in the colors and aspects and partial phases in which it pleases the subject to regard it. The state of passion and its influence on the Cognitive Faculties are truly pictured by Boethius.[1]

Boethius quoted.

"Nubibus atris
Condita nullum
Fundere possunt
Sidera lumen.
Si mare volvens
Turbidus auster
Misceat æstum,
Vitrea dudum,
Parque serenis
Unda diebus,
Mox resoluto
Sordida cœno,
Visibus obstat.
. . . . . . .
Tu quoque si vis
Lumine claro

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[1] *De Consol. Phil.*, L. i., Metr. 7. — Ed.

Cernere verum,
Tramite recto
Carpere callem:
Gaudia pelle,
Pelle timorem,
Spemque fugato,
Nec dolor adsit,
Nubila mens est,
Vinctaque frenis,
Hæc ubi regnant."

Error limited to Probable Reasoning.

Every error consists in this, — that we take something for non-existent, because we have not become aware of its existence, and that, in place of this existent something, we fill up the premises of a probable reasoning with something else.

I have here limited the possibility of error to Probable Reasoning, for, in Intuition and Demonstration, there is but little possibility of important error. Hobbes indeed asserts that had it been contrary to the interest of those in authority, that the three angles of a triangle should be equal to two right angles, this truth would have been long ago proscribed as heresy, or as high treason.[1] This may be an ingenious illustration of the blind tendency of the passions to subjugate intelligence; but we should take it for more than was intended by its author, were we to take it as more than an ingenious exaggeration. Limiting, therefore, error to probable inference (and this constitutes, with the exception of a comparatively small department, the whole domain of human reasoning), we have to inquire, How do the Passions influence us to the assumption of false premises? To estimate the amount of probability for or against a given proposition, requires a tranquil, an unbiassed, a comprehensive consideration, in order to take all the relative elements of judgment into due account. But this requisite state of mind is disturbed when any interest, any wish, is allowed to interfere.

**Par. XCV. The Passions, as sources of Error, — reduced to four.**

¶ XCV. The disturbing Passions may be reduced to four: Precipitancy, Sloth, Hope and Fear, Self-love.

1°. A restless anxiety for a decision begets impatience, which decides before the preliminary inquiry is concluded. This is precipitancy.

2°. The same result is the effect of Sloth, which dreams on in conformity to custom, without subjecting its beliefs to the test of active observation.

3°. The restlessness of Hope or Fear impedes observation, distracts attention, or forces it only on what interests the passion; — the sanguine looking on only what harmonizes with his hopes, the diffident only on what accords with his fears.

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[1] *Leviathan*. Part I. ch. 11. — ED.

4°. Self-love perverts our estimate of probability by causing us to rate the grounds of judgment, not according to their real influence on the truth of the decision, but according to their bearing on our personal interests therein.

Explication.
1. Precipitancy.

Seneca

Erasmus.

In regard to Impatience or Precipitation, — "all is the cause of this which determines our choice on one side rather than another. An imagination excites pleasure, and because it excites pleasure we yield ourselves up to it. We suppose, for example, that we are all that we ought to be, and why? Because this supposition gives us pleasure. This, in some dispositions, is one of the greatest obstacles to improvement; for he who entertains it, thinks there is no necessity to labor to become what he is already. 'I believe,' says Seneca,[1] 'that many had it in their power to have attained to wisdom, had they not been impeded by the belief that wisdom they had already attained.' 'Multos puto ad sapientiam potuisse pervenire, nisi putassent se pervenisse.'"[2] Erasmus gives the following as the principal advice to a young votary of learning in the conduct of his studies: "To read the most learned books, to converse with the most learned men; but, above all, never to conceit that he himself was learned."[3]

Illustrations.

From Seneca.

From Montaigne

"From the same cause, men flatter themselves with the hope of dying old, although few attain to longevity. The less probable the event, the more certain are they of its occurrence; and why? Because the imagination of it is agreeable. 'Decrepiti senes paucorum annorum accessionem votis mendicant; minores natu seipsos esse fingunt; mendacio sibi blandiuntur; et tam libenter fallunt, quam si fata una decipiant.'"[4] "Preachers," says Montaigne, "are aware that the emotion which arises during their sermons animates themselves to belief, and we are conscious that when roused to anger we apply ourselves more intently to the defence of our thesis, and embrace it with greater vehemence and approbation, than we did when our mind was cool and unruffled. You simply state your case to an advocate; he replies with hesitation and doubt; you are aware that it is indifferent to him whether he undertakes the defence of the one side or of the other; but have you once fee'd him well to take your case in hand; he begins to feel an interest in it; his will is animated. His reason and his science become also animated in proportion. Your case presents itself to his understanding as a manifest and indubitable truth; he now sees it in a wholly different light, and really believes that you have law and justice on your side."[1] It is proper to observe that Montaigne was himself a lawyer, — he had been a counsellor of the Parliament of Bordeaux.

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[1] *De Tranquillitate Animi*, c. 1. — Ed.

[2] Crousaz, *Logique*, t. iii., part ii. ch. 7, p. 297. — Ed.

[3] "Joannes Alexander Brassicanus rogavit Erasmum, qua ratione doctus posset fieri, respondit ex tempore: si doctis assidue conviveret, si doctos audiret non minus submisse quam honorifice, si doctos strenue legeret, si doctos diligenter edisceret, denique si se doctum nunquam putaret." Motto to G. J. Vossius, *Opuscula de Studiorum Ratione*. See Crenius, *Consilia et Methodus*, etc., p. 686, 1692. — Ed.

[4] Seneca, *De Brevitate Vitæ*, ch. 11. Crousaz, *Logique*, t. iii. p. ii. ch. 7, p. 297, ed. 1725. — Ed.

Precipitate Dogmatism and Skepticism, phases of the same disposition.

It might seem that Precipitate Dogmatism and an inclination to Skepticism were opposite characters of mind. They are, however, closely allied, if not merely phases of the same disposition. This is indeed confessed by the skeptic Montaigne.[2] "The most uneasy condition for me is to be kept in suspense on urgent occasions, and to be agitated between fear and hope. Deliberation, even in things of lightest moment, is very troublesome to me; and I find my mind more put to it, to undergo the various tumbling and tossing of doubt and consultation, than to set up its rest, and to acquiesce in whatever shall happen, after the die is thrown. Few passions break my sleep; but of deliberations, the least disturbs me."

Remedy for Precipitation.

Precipitation is no incurable disease. There is for it one sure and simple remedy, if properly applied. It is only required, to speak with Confucius, manfully to restrain the wild horse of precipitancy by the curb of consideration, — to weigh the reasons of decision, each and all, in the balance of cool investigation, — not to allow ourselves to decide until a clear consciousness has declared these reasons to be true, — to be sufficient; and, finally, to throw out of account the suffrages of self-love, of prepossession, of passion, and to admit only those of reflection, of experience, and of evidence. This remedy is certain and effectual. In theory it is satisfactory, but its practical application requires a moral resolution, for the acquisition of which no precept can be given.

In the second place, "Sloth is likewise a cause of precipitation, and it deserves the more attention as it is a cause of error extremely frequent, and one of which we are ourselves less aware, and which is less notorious to others. We feel it fatiguing to continue an investigation, therefore we do not pursue it; but as it is mortifying to think that we have labored in vain, we easily admit the flattering illusion that we have succeeded. By the influence of this disposition it often happens, that, after having rejected what first presented itself, — after having rejected a second time and a third time what subsequently turned up, because not sufficiently applicable or certain, we get tired of the investigation, and perhaps put up with the fourth suggestion, which is not better, haply even worse, than the preceding; and this simply because it has come into the mind when more exhausted and less scrupulous than it was at the commencement."[1] "The volition of that man," says Seneca, "is often frustrated, who undertakes not what is easy, but who wishes what he undertakes to be easy. As often as you attempt anything, compare together yourself, the end which you propose, and the means by which it is to be accomplished. For the repentance of an unfinished work will make you rash. And here it is of consequence whether a man be of a fervid or of a cold, of an aspiring or of a humble, disposition."[2]

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[1] *Essais*, L. ii. ch. 12. Quoted by Crousaz, *l. c.* — ED.

[2] *Essais*, L. ii. c. 17. — ED.

2. Sloth.

Seneca quoted.

To remedy this failing it is necessary, in conformity with this advice of Seneca, to consult our forces, and the time we can afford, and the difficulty of the subjects on which we enter. We ought to labor only at intervals, to avoid the tedium and disquiet consequent on unremitted application; and to adjourn the consideration of any thought which may please us vehemently at the moment, until the prepossession in its favor has subsided with the animation which gave it birth.

Its remedy.

The two Causes of premature judgment — the affections of Impatience and Sloth — being considered, I pass on to the third principle of Passion, by which the intellect is turned aside from the path of truth, — I mean the disturbing influence of Hope and Fear. These passions, though reciprocally contrary, determine a similar effect upon the deliberations of the Understanding, and are equally unfavorable for the interest of truth. In forming a just conclusion upon a question of probable reasoning, that is, where the grounds of decision are not few, palpable, and of determinate effect, — and such questions

3. Hope and Fear

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[1] Crousaz, *Logique*, t. iii. part ii. ch 7, p. 302. — Ed.

[2] *De Ira*, L. iii, c. 7 Quoted by Crousaz, *Logique*, t. iii. p. 302. — Ed.

may be said to be those alone on which differences of opinion may arise, and are, consequently, those alone which require for their solution any high degree of observation and ingenuity, — in such questions hope and fear exert a very strong and a very unfavorable influence. In these questions it is requisite, in the first place, to seek out the premises; and, in the second, to draw the conclusion. Of these requisites the first is the more important, and it is also by far the more difficult.

How Hope and Fear operate unfavorably on the Understanding.

Now the passions of Hope and Fear operate severally to prevent the intellect from discovering all the elements of decision, which ought to be considered in forming a correct conclusion, and cause it to take into account those only which harmonize with that conclusion to which the actuating passion is inclined. And here the passion operates in two ways. In the first place, it tends so to determine the associations of thought, that only those media of proof are suggested or called into consciousness, which support the conclusion to which the passion tends. In the second place, if the media of proof by which a counter conclusion is supported are brought before the mind, still the mind is influenced by the passion to look on their reality with doubt, and, if such cannot be questioned, to undervalue their inferential importance; whereas it is moved to admit, without hesitation, those media of proof which favor the conclusion in the interest of our hope or fear, and to exaggerate the cogency with which they establish this result. Either passion looks exclusively to a single end, and exclusively to the means by which that single end is accomplished. Thus the sanguine temperament, or the mind under the habitual predominance of hope, sees only and magnifies all that militates in favor of the wished-for consummation, which alone it contemplates; whereas the melancholic temperament, or the mind under the habitual predominance of fear, is wholly occupied with the dreaded issue, views only what tends to its fulfilment, while it exaggerates the possible into the probable, the probable into the certain. Thus it is that whatever conclusion we greatly hope or greatly fear, to that conclusion we are disposed to leap; and it has become almost proverbial, that men lightly believe both what they wish, and what they dread, to be true.

But the influence of Hope on our judgments, inclining us to find whatever we wish to find, in so far as this arises from the illusion of Self-love, is comprehended in this, — the fourth cause of Error, — to which I now proceed.

4. Self-love.

Self-love, under which I include the dispositions of Vanity, Pride, and, in general, all those which incline us to attribute an undue weight to those opinions in which we feel a personal interest, is by far the most extensive and influential in the way of reason and truth. In virtue of this principle, whatever is ours — whatever is adopted or patronized by us, whatever belongs to those to whom we are attached — is either gratuitously clothed with a character of truth, or its pretensions to be accounted true are not scrutinized with the requisite rigor and impartiality. I am a native of this country, and, therefore, not only is its history to me a matter of peculiar interest, but the actions and character of my countrymen are viewed in a very different light from that in which they are regarded by a foreigner. I am born and bred a member of a religious sect, and because they constitute my creed, I find the tenets of this sect alone in conformity to the Word of God. I am the partisan of a philosophical doctrine, and am, therefore, disposed to reject whatever does not harmonize with my adopted system.

Aristotle, — his precept.

It is the part of a philosopher, says Aristotle, inasmuch as he is a philosopher, to subjugate self-love, and to refute, if contrary to truth, not only the opinions of his friends, but the doctrines which he himself may have professed.[1] It is certain, however, that philosophers — for philosophers are men — have been too often found to regulate their conduct by the same opposite principle. That man pretended to the name of philosopher, who scrupled not to declare that he would rather be in the wrong with Plato than in the right with his opponents.[2] "Gisbert Voetius urged Mersennus to refute a work of Descartes a year before the book appeared, and before he had himself the means of judging whether the opinions it contained were right or wrong. A certain professor of philosophy in Padua came to Galileo, and requested that he would explain to him the meaning of the term *parallaxis ;* which he wished, he said, to refute, having heard that it was opposed to Aristotle's doctrine touching the relative situation of the comets. What! answered Galileo, you wish to controvert a word the meaning of which you do not know! Redi tells us that a sturdy Peripatetic of his acquaintance would never consent to look at the heavens through a telescope, lest he should be compelled to admit the existence of the new stars discovered by Galileo and others. The same Redi informs us that he knew another Peripatetic, a staunch advocate of

Illustrations of the influence of Self-love on our opinions.

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[1] *Eth. Nic.*, i. 4 (6). — Ed.

[2] Cicero, *Tusc. Quæst.*, i. 17.

the Aristotelian doctrine of equivocal generation (a doctrine, by the way, which now again divides the physiologists of Europe), and who, in particular, maintained that the green frogs which appear upon a shower come down with the rain, who would not be induced himself to select and examine one of these frogs. And why? Because he was unwilling to be convicted of his error, by Redi showing him the green matter in the stomach, and its feculæ in the intestines of the animal."[1] The spirit of the Peripatetic philosophy was, however, wholly misunderstood by these mistaken followers of Aristotle; for a true Aristotelian is one who listens rather to the voice of nature than to the precept of any master, and it is well expressed in the motto of the great French anatomist, — Riolanus est Peripateticus; credit ea, et ea tantum, quæ vidit. From the same principle proceeds the abuse, and sometimes even the persecution, which the discoverers of new truths encounter from those who cherished opinions these truths subvert.

Self-love leads us to regard with favor the opinions of those to whom we are in any way attached.

In like manner, as we are disposed to maintain our own opinion, we are inclined to regard with favor the opinions of those to whom we are attached by love, gratitude, and other conciliatory affections. "We do not limit our attachment to the persons of our friends, — we love in a certain sort all that belongs to them; and as men generally manifest sufficient ardor in support of their opinions, we are led insensibly by a kind of sympathy to credit, to approve, and to defend these also, and that even more passionately than our friends themselves. We bear affection to others for various reasons. The agreement of tempers, of inclinations, of pursuits; their appearance, their manners, their virtue, the partiality which they have shown to us, the services we have received at their hands, and many other particular causes, determine and direct our love.

Malebranche adduced to this effect.

"It is observed by the great Malebranche,[2] that if any of our friends, — any even of those we are disposed to love, — advance an opinion, we forthwith lightly allow ourselves to be persuaded of its truth. This opinion we accept and support, without troubling ourselves to inquire whether it be conformable to fact, frequently even against our conscience, in conformity to the darkness and confusion of our intellect, to the corruption of our heart, and to the advantages which we hope to reap from our facility and complaisance."[1]

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[1] Reimarus, p. 389. [*Die Vernunftlehre*, von *H. S. R.* (Hermann Samuel Reimarus), dritte Auflage, Hamburg, 1766, § 332. First published in 1756. The above four anecdotes are all taken from this work. — Ed.]

[2] *Recherche de la Vérité*, L. iv. ch. 13. — Ed.

This shown especially when the passion changes.

Arnauld holds that man is naturally envious.

The influence of this principle is seen still more manifestly when the passion changes; for though the things themselves remain unaltered, our judgments concerning them are totally reversed. How often do we behold persons who cannot, or will not, recognize a single good quality in an individual from the moment he has chanced to incur their dislike, and who are even ready to adopt opinions, merely because opposed to others maintained by the object of their aversion? The celebrated Arnauld[2] goes so far even as to assert, that men are naturally envious and jealous; that it is with pain they endure the contemplation of others in the enjoyment of advantages which they do not themselves possess; and, as the knowledge of truth and the power of enlightening mankind is of one of these, that they have a secret inclination to deprive them of that glory. This accordingly often determines them to controvert without a ground the opinions and discoveries of others. Self-love accordingly often argues thus: — 'This is an opinion which I have originated, this is an opinion, therefore, which is true;' whereas the natural malignity of man not less frequently suggests such another: 'It is another than I who has advanced this doctrine; this doctrine is, therefore, false.'

The love of Disputation.

We may distinguish, however, from malignant or envious contradiction another passion, which, though more generous in its nature and not simply a mode of Self-love, tends, nevertheless, equally to divert us from the straight road of truth, — I mean Pugnacity, or the love of Disputation. Under the influence of this passion, we propose as our end victory, not truth. We insensibly become accustomed to find a reason for any opinion, and, in placing ourselves above all reasons, to surrender our belief to none. Thus it is why two disputants so rarely ever agree, and why a question is seldom or never decided in a discussion, where the combative dispositions of the reasoners have once been roused into activity. In controversy it is always easy to find wherewithal to reply; the end of the parties is not to avoid error, but to impose silence; and they are less ashamed of continuing wrong than of confessing that they are not right.[3]

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[1] Caro, *Nouvelle Logique*, part ii., ch. viii., p. 288. — Ed.

[2] *L' Art de Penser* (*Port Royal Logic*), p. iii. ch. 20. — Ed.

[3] *L' Art de Penser*, p. iii. ch. 20. Cf. Caro, *Nouvelle Logique*, part ii., ch. 9, p. 311, Paris 1820. — Ed.

These affections the immediate causes of all error.

Preliminary conditions requisite for the efficiency of precepts against the sources of error.

These affections may be said to be the immediate causes of all error. Other causes there are, but not immediate. In so far as Logic detects the sources of our false judgments and shows their remedies, it must carefully inculcate that no precautionary precept for particular cases can avail, unless the inmost principle of the evil be discovered, and a cure applied. You must, therefore, as you would remain free from the hallucination of false opinion, be convinced of the absolute necessity of following out the investigation of every question calmly and without passion. You must learn to pursue, and to estimate, truth without distraction or bias. To this there is required, as a primary condition, the unshackled freedom of thought, the equal glance which can take in the whole sphere of observation, the cool determination to pursue the truth whithersoever it may lead; and, what is still more important, the disposition to feel an interest in truth and in truth alone. If perchance some collateral interest may first prompt us to the inquiry, in our general interest for truth we must repress, — we must forget, this interest, until the inquiry be concluded. Of what account are the most venerated opinions if they be untrue? At best they are only venerable delusions. He who allows himself to be actuated in his scientific procedure by any partial interest, can never obtain a comprehensive survey of the whole he has to take into account, and always, therefore, remains incapable of discriminating, with accuracy, error from truth. The independent thinker must, in all his inquiries, subject himself to the genius of truth, — must be prepared to follow her footsteps without faltering or hesitation. In the consciousness that truth is the noblest of ends, and that he pursues this end with honesty and devotion, he will dread no consequences, — for he relies upon the truth. Does he compass the truth, he congratulates himself upon his success; does he fall short of its attainment, he knows that even his present failure will ultimately advance him to the reward he merits. Err he may, and that perhaps frequently, but he will never deceive himself. We cannot, indeed, rise superior to our limitary nature, we cannot, therefore, be reproached for failure; but we are always responsible for the calmness and impartiality of our researches, and these alone render us worthy of success. But though it be manifest, that to attain the truth we must follow whithersoever the truth may lead, still men in general are found to yield not an absolute, but only a restricted, obedience to the precept. They capitulate, and do not unconditionally surrender. I give up, but my cherished dogma in religion must not be canvassed, says one; — my political principles are above inquiry, and must be exempted, says a second; — my country is the land of lands, this cannot be disallowed, cries a third; — my order, my vocation, is undoubtedly the noblest, exclaim a fourth and fifth; — only do not require that we should confess our having erred, is the condition which many insist on stipulating. Above all, that resolve of mind is difficult, which is ready to surrender all fond convictions, and is prepared to recommence investigation the moment that a fundamental error in the former system of belief has been detected. These are the principal grounds why, among men, opinion is so widely separated from opinion; and why the clearest demonstration is so frequently for a season frustrated of victory.

Par. XCVI. Rules against Errors from the Affections.

¶ XCVI. Against the Errors which arise from the Affections, there may be given the three following rules:

1°. When the error has arisen from the influence of an active affection, the decisive judgment is to be annulled; the mind is then to be freed, as far as possible, from passion, and the process of inquiry to be recommenced as soon as the requisite tranquillity has been restored.

2°. When the error has arisen from a relaxed enthusiasm for knowledge, we must reänimate this interest by a vivid representation of the paramount dignity of truth, and of the lofty destination of our intellectual nature.

3°. In testing the accuracy of our judgments, we must be particularly suspicious of those results which accord with our private inclinations and predominant tendencies.

These rules require no comment.

# LECTURE XXX

## MODIFIED STOICHEIOLOGY.

### SECTION II.—ERROR—ITS CAUSES AND REMEDIES.

### B.—AS IN THE COGNITIONS, FEELINGS, AND DESIRES.

### II.—WEAKNESS AND DISPROPORTIONED STRENGTH OF THE FACULTIES OF KNOWLEDGE.

Weakness and Disproportioned Strength of the Faculties of Knowledge.

I NOW go on to the Second Head of the class of Errors founded on the Natural Constitution, the Acquired Habits, and the Reciprocal Relations of our Cognitive and Affective Powers, that is, to the Causes of Error which originate in the Weakness or Disproportioned Strength of one or more of our Faculties of Knowledge themselves.

Neglect of the Limited Nature of the Human Intellect a source of error.

Here, in the first place, I might consider the errors which have arisen from the Limited Nature of the Human Intellect in general,—or rather from the mistakes that have been made by philosophers in denying or not taking this limited nature into account.[1] The illustration of this subject is one which is relative to, and supposes an acquaintance with, some of the abstrusest speculations in Philosophy, and which belong not to Logic, but to Metaphysics. I shall not, therefore, do more than simply indicate at present, what it will be proper at another season fully to explain.

1. Philosophy of the Absolute.

It is manifest, that, if the human mind be limited,—if it only knows as it is conscious, and if it be only conscious, as it is conscious of contrast and opposition,—of an ego and non-ego,—if this supposition, I say, be correct, it is evident that those philosophers are in error, who virtually assume that the human mind is unlimited, that is, that the human mind is capable of a knowledge superior to consciousness, — a cognition in which knowledge and existence — the Ego and non-Ego — God and the creature — are identical; that is, of an act in which the mind is the Absolute, and knows the Absolute. This philosophy, the statement of which, as here given, it would require a long commentary to make you understand, is one which has for many years been that dominant in Germany; it is called the *Philosophy of the Absolute*, or the *Philosophy of Absolute Identity*. This system, of which Schelling and Hegel are the great representatives, errs by denying the limitation of human intelligence without proof, and by boldly building its edifice on this gratuitous negation.[1]

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[1] [On this subject see Crusius.] [Christian August Crusius, *Weg zur Gewissheit und Zuverlässigkeit der menschlichen Erkenntniss*, § 443, 1st ed. 1747.—ED.

2. A one-sided view of the finitude of mind

But there are other forms of philosophy which err not in actually postulating the infinity of mind, but in taking only a one-sided view of its finitude. It is a general fact, which seems, however, to have escaped the observation of philosophers, that whatever we can positively compass in thought, — whatever we can conceive as possible, — in a word, the *omne cogitabile*, lies between two extremes or poles, contradictorily opposed, and one of which must consequently be true, but of neither of which repugnant opposites are we able to represent to our mind the possibility.[2] To take one example out of many: we cannot construe to the mind as possible the absolute commencement of time; but we are equally unable to think the possibility of the counter alternative, — its infinite or absolute non-commencement, in other words, the infinite regress of time. Now it is evident, that, if we looked merely at the one of these contradictory opposites and argued thus: whatever is inconceivable is impossible, the absolute commencement of time is inconceivable, therefore the absolute commencement of time is impossible; but, on the principles of Contradiction and Excluded Middle, one or other of the two opposite contradictories must be true; therefore, as the absolute commencement of time is impossible, the absolute or infinite non-commencement of time is necessary: — I say, it is evident that this reasoning would be incompetent and one-sided, because it might be converted; for, by the same one-sided process, the opposite conclusion might be drawn in favor of the absolute commencement of time.

Illustrated by reference to the two contradictories, — the absolute commencement, and the infinite non-commencement of Time.

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[1] See *Discussions*, p. 19. — Ed.

[2] See *Discussions*, p. 601 *et seq.*, *Lectures on Metaphysics*, p. 527 *et seq.* — Ed.

The same principle exemplified in the case of the Necessitarian Argument against the Freedom of the Human Will.

Now, the unilateral and incompetent reasoning which I have here supposed in the case of time, is one of which the Necessitarian is guilty in his argument to prove the impossibility of human volitions being free. He correctly lays down, as the foundation of his reasoning, two propositions which must at once be allowed: 1°, That the notion of the liberty of volition involves the supposition of an absolute commencement of volition, that is, of a volition which is a cause, but is not itself, *qua* cause, an effect. 2°, That the absolute commencement of a volition, or of aught else, cannot be conceived, that is, cannot be directly or positively thought as possible. So far he is correct; but when he goes on to apply these principles by arguing (and be it observed this syllogism lies at the root of all the reasonings for necessity), *Whatever is inconceivable is impossible; but the supposition of the absolute commencement of volition is inconceivable; therefore, the supposition of the absolute commencement of volition* (*the condition of free will*) *is impossible*, — we may here demur to the sumption, and ask him, — Can he positively conceive the opposite contradictory of the absolute commencement, that is, an infinite series of relative non-commencements? If he answers, as he must, that he cannot, we may again ask him, — By what right he assumed as a self-evident axiom for his sumption, the proposition, — that *whatever is inconceivable is impossible*, or by what right he could subsume his minor premise, when by his own confession he allows that the opposite contradictory of his minor premise, that is, the very proposition he is apagogically proving, is, likewise, inconceivable, and, therefore, on the principle of his sumption, likewise impossible.

And in the case of the Libertarian Argument in behalf of Free-will.

The same inconsequence would equally apply to the Libertarian, who should attempt to prove that free-will must be allowed, on the ground that its contradictory opposite is impossible, because inconceivable. He cannot prove his thesis by such a process; in fact, by all speculative reasoning from the conditions of thought, the two doctrines are *in æquilibrio*; — both are equally possible, — both are equally inconceivable. It is only when the Libertarian descends to arguments drawn from the fact of the Moral Law and its conditions, that he is able to throw in reasons which incline the balance in his favor.

On these matters, I however, at present, only touch, in order to show you under what head of Error these reasonings would naturally fall.

Weakness or disproportioned strength of the several Cognitive Faculties, — a source of Error.

Cognitive Faculties of two classes, a Lower and a Higher.

Leaving, therefore, or adjourning, the consideration of the imbecility of the human intellect in general, I shall now take into view, as a source of logical error, the Weakness or Disproportioned Strength of the several Cognitive Faculties. Now, as the Cognitive Faculties in man consist partly of certain Lower Powers, which he possesses in common with other sensible existences, namely, the Presentative, the Retentive, the Representative and the Reproductive Faculties, and partly of certain Higher Powers, in virtue of which he enters into the rank of intelligent existences, namely, the Elaborative and Regulative Faculties, — it will be proper to consider the powers of these two classes severally in succession, in so far as they may afford the causes or occasions of error.

I. The Lower Class, — 1. The Presentative Faculty.

Of the lower class, the first faculty in order is the Presentative or Acquisitive Faculty. This, as you remember, is divided into two, viz., into the faculty which presents us with the phenomena of the outer world, and into the faculty which presents us with the phenomena of the inner.[1] The former is External Perception, or External Sense; the latter is Self-consciousness, Internal Perception, or Internal Sense. I commence, therefore, with the Faculty of External Perception, in relation to which I give you the following paragraph.

Par. XCVII. (a) External Perception, — as a source of Error.

> ¶ XCVII. When aught is presented through the outer senses, there are two conditions necessary for its adequate perception: — 1°, The relative Organs must be present, and in a condition to discharge their functions; and 2°, The Objects themselves must bear a certain relation to these organs, so that the latter shall be suitably affected, and thereby the former suitably apprehended. It is possible, therefore, that, partly through the altered condition of the organs, partly through the altered situation of the objects, dissimilar presentations of the same, and similar presentations of different, objects, may be the result.[2]

"In the first place, without the organs specially subservient to

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[1] See *Lectures on Metaphysics*, p. 282 *et seq.*—ED.

[2] Krug, *Logik*, § 138. — ED. [Cf. Caro, *Nouvelle Logique*, part ii. ch. vi. p. 273. Bachmann, *Logik*, § 407. p. 553.]

External Perception, — without the eye, the ear, etc., sensible perceptions of a precise and determinate character, such, for example, as color or sound, are not competent to man. In the second place, to perform their functions, these organs must be in a healthy or normal state; for if this condition be not fulfilled, the presentations which they furnish are null, incomplete, or false. But, in the third place, even if the organs of sense are sound and perfect, the objects to be presented and perceived must stand to these organs in a certain relation, — must bear to them a certain proportion; for, otherwise, the objects cannot be presented at all, or cannot be perceived without illusion. The sounds, for example, which we are to hear, must neither be too high nor too low in quality; the bodies which we are to see, must neither be too near nor too distant, — must neither be too feebly nor too intensely illuminated. In relation to the second condition, there are given, in consequence of the altered state of the organs, on the one hand, different presentations of the same object; — thus to a person who has waxed purblind, his friend appears as an utter stranger, the eye now presenting its objects with less clearness and distinctness. On the other hand, there are given the same, or undistinguishably similar, presentations of different objects; — thus to a person in the jaundice, all things are presented yellow. In relation to the third condition, from the altered position of objects, there are, in like manner, determined, on the one hand, different presentations of the same objects, — as when the stick which appears straight in the air appears crooked when partially immersed in water; and, on the other hand, identical presentations of different objects, as when a man and a horse appear in the distance to be so similar, that the one cannot be discriminated from the other. In all these cases, these illusions are determined, — illusions which may easily become the occasions of false judgments."[1]

Explication.

Conditions of the adequate activity of External Perception.

Possible illusions of the Senses.

"In regard to the detection of such illusions and obviating the error to which they lead, it behooves us to take the following precautions. We must, in the first place, examine the state of the organ. If found defective, we must endeavor to restore it to perfection; but if this cannot be done, we must ascertain the extent and nature of the evil, in order to be upon our guard in regard to quality and degree of the false presentation.

Precautions with a view to the detection of illusions of the Senses, and obviating the errors to which they lead.

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[1] Krug, *Logik*, § 138. Anm. — Ed.

"In the second place, we must examine the relative situation of the object, and if this be not accommodated to the organ, we must either obviate the disproportion and remove the media which occasion the illusion, or repeat the observation under different circumstances, compare these, and thus obtain the means of making an ideal abstraction of the disturbing causes."[1]

In regard to the other Presentative Faculty, — the Faculty of Self-consciousness, — Internal Perception, or Internal Sense, as we know less of the material conditions which modify its action, we are unable to ascertain so precisely the nature of the illusions of which it may be the source. In reference to this subject you may take the following paragraph.

Par. XCVIII. (b) Self-consciousness, — as a source of Error.

> ¶ XCVIII. The faculty of Self-consciousness, or Internal Sense, is subject to various changes, which either modify our apprehensions of objects, or influence the manner in which we judge concerning them. In so far, therefore, as false judgments are thus occasioned, Self-consciousness is a source of error.[2]

Explication. Self-consciousness varies in intensity.

It is a matter of ordinary observation, that the vivacity with which we are conscious of the various phenomena of mind, differs not only at different times, in different states of health, and in different degrees of mental freshness and exhaustion, but, at the same time, differs in regard to the different kinds of these phenomena themselves. According to the greater or less intensity of this faculty, the same thoughts of which we are conscious are, at one time, clear and distinct, at another, obscure and confused. At one time we are almost wholly incapable of reflection, and every act of self-attention is forced and irksome, and differences the most marked pass unnoticed; while, at another, our self-consciousness is alert, all its applications pleasing, and the most faint and fugitive phenomena arrested and observed. On one occasion, self-consciousness, as a reflective cognition, is strong; on another, all reflection is extinguished in the intensity of the direct consciousness of feeling or desire. In one state of mind our representations are feeble; in another, they are so lively that they are mistaken for external realities. Our self-consciousness may thus be the occasion of frequent error; for, according to its various modifications, we may form the most opposite judgments concerning the same things, — pronouncing them, for example, now to be agreeable, now to be disagreeable, according as our Internal Sense is variously affected.

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[1] Krug, *Logik*, § 155. — Ed.

[2] Krug, *Logik*, § 139. — Ed.

The next is the Retentive or Conservative Faculty, — Memory strictly so called; in reference to which I give you the following paragraph.

Par. XCIX. 2. Memory, — as a source of Error.

> ¶ XCIX. Memory, or the Conservative Faculty, is the occasion of Error, both when too weak and when too strong. When too weak, the complement of cognitions which it retains is small and indistinct, and the Understanding or Elaborative Faculty is, consequently, unable adequately to judge concerning the similarity and differences of its representations and concepts. When too strong, the Understanding is overwhelmed with the multitude of acquired cognitions simultaneously forced upon it, so that it is unable calmly and deliberately to compare and discriminate these.[1]

Explication.

That both these extremes, — that both the insufficient and the superfluous vigor of the Conservative Faculty are severally the sources of error, it will not require many observations to make apparent.

Feeble memory.

In regard to a feeble memory, it is manifest that a multitude of false judgments must inevitably arise from an incapacity in this faculty to preserve the observations committed to its keeping. In consequence of this incapacity, if a cognition be not wholly lost, it is lost at least in part, and the circumstances of time, place, persons and things confounded with each other. For example, — I may recollect the tenor of a passage I have read, but from defect of memory may attribute to one author what really belongs to another. Thus a botanist may judge two different plants to be identical in species, having forgotten the differential characters by which they were discriminated; or he may hold the same plant to be two different species, having examined it at different times and places.[2]

Strong memory.

Though nothing could be more erroneous than a general and unqualified decision, that a great memory is incompatible with a sound judgment, yet it is an observation confirmed by the experience of all ages and countries, not only that a great memory is no condition of high intellectual talent, but that great memories are very frequently found in combination with comparatively feeble powers of thought.[1] The truth seems to be, that where a vigorous memory is conjoined with a vigorous intellect, not only does the force of the subsidiary faculty not detract from the strength of the principal, but, on the contrary, tends to confer on it a still higher power; whereas when the inferior faculty is disproportionately strong, that so far from nourishing and corroborating the superior, it tends to reduce this faculty to a lower level than that at which it would have stood, if united with a less overpowering subsidiary. The greater the magazine of various knowledge which the memory contains, the better for the understanding, provided the understanding can reduce this various knowledge to order and subjection. "A great memory is the principal condition of bringing before the mind many different representations and notions at once, or in rapid succession. This simultaneous or nearly simultaneous presence disturbs, however, the tranquil comparison of a small number of ideas, which, if it shall judge aright, the intellect must contemplate with a fixed and steady attention."[2] Now, where an intellect possesses the power of concentration in a high degree, it will not be harassed in its meditations by the officious intrusions of the subordinate faculties, however vigorous these in themselves may be, but will control their vigor by exhausting in its own operations the whole applicable energy of mind. Whereas where the inferior is more vigorous than the superior, it will, in like manner, engross in its own function the disposable amount of activity, and overwhelm the principal faculty with materials, many even in proportion as it is able to elaborate few. This appears to me the reason why men of strong memories are so often men of proportionally weak judgments, and why so many errors arise from the possession of a faculty, the perfection of which ought to exempt them from many mistaken judgments.

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[1] [Cf. Bachmann, *Logik*, § 408.]

[2] Krug. *Logik*, § 141. Anm. — ED.

Remedies for these opposite extremes

As to the remedy for these opposite extremes. The former — the imbecility of Memory — can only be alleviated by invigorating the capacity of Retention through mnemonic exercises and methods; the latter, — the inordinate vigor of Memory, — by cultivating the Understanding to the neglect of the Conservative Faculty. It will, likewise, be necessary to be upon our guard against the errors originating in these counter sources. In the one case distrusting the accuracy of facts, in the other, the accuracy of their elaboration.[3]

The next faculty is the Reproductive. This, when its operation is voluntarily exerted, is called *Recollection* or *Reminiscence;* when it energizes spontaneously or without volition, it is called *Suggestion.* The laws by which it is governed in either case, but especially in the latter, are called the *Laws of Mental Association.* This Reproductive Faculty, like the Retentive, is the cause of error, both if its vigor be defective, or if it be too strong. I shall consider Recollection and Suggestion severally and apart. In regard to the former I give you the following paragraph.

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[1] Compare *Lectures on Metaphysics*, p. 424. — Ed.

[2] Diderot, *Lettre sur les Sourds et Muets*, quoted by Stewart, *Elem.*, Part iii. ch. i. sect vi. *Collected Works*, vol. iv. p. 249.

[3] Cf. Krug, *Logik*, § 156. Anm. — Ed.

3. The Reproductive Faculty.

¶ C. The Reproductive Faculty, in so far as it is voluntarily exercised, as Reminiscence, becomes a source of Error, as it is either too sluggish or too prompt, precisely as the Retentive Faculty, combined with which it constitutes Memory in the looser signification.

Par. C. (a) Reminiscence, — as a source of Error.

It is necessary to say very little in special reference to Reminiscence, for what was said in regard to the Conservative Faculty or Memory Proper in its highest vigor, was applicable to, and in fact supposed a corresponding degree of, the Reproductive. For, however great may be the mass of cognitions retained in the mind, that is, out of consciousness but potentially capable of being called into consciousness, these can never of themselves oppress the Understanding by their simultaneous crowding or rapid succession, if the faculty by which they are revoked into consciousness be inert; whereas if this revocative faculty be comparatively alert and vigorous, a smaller magazine of retained cognitions may suffice to harass the intellect with a ceaseless supply of materials too profuse for its capacity of elaboration.

Explication.
Reminiscence, — its undue activity.

On the other hand, the inactivity of our Recollection is a source of error, precisely as the weakness of our Memory proper; for it is of the same effect in relation to our judgments, whether the cognitions requisite for a decision be not retained in the mind, or whether, being retained, they are not recalled into consciousness by Reminiscence.

Its inactivity.

In regard to Suggestion, or the Reproductive Faculty operating spontaneously, that is, not in subservience to an act of Will, — I shall give you the following paragraph.

¶ CI. As our Cognitions, Feelings, and Desires are connected together by what are called the *Laws of Association,* Par. CI. (b) Suggestion, — as a source of Error.

and as each link in the chain of thought suggests or awakens into consciousness some other in conformity to these Laws, — these Laws, as they bestow a strong subjective connection on thoughts and objects of a wholly arbitrary union, frequently occasion great confusion and error in our judgments.

Explication.

"Even in methodical thinking, we do not connect all our thoughts intentionally and rationally, but many press forward into the train, either in consequence of some external impression, or in virtue of certain internal relations, which, however, are not of a logical dependency. Thus, thoughts tend to suggest each other, which have reference to things of which we were previously cognizant as coëxistent, or as immediately consequent, which have been apprehended as bearing a resemblance to each other, or which have stood together in reciprocal and striking contrast. This connection, though precarious and non-logical, is thus, however, governed by certain laws, which have been called the *Laws of Association*."[1] These laws, which I have just enumerated, viz., the Law of Coëxistence or Simultaneity, the Law of Continuity or Immediate Succession, the Law of Similarity, and the Law of Contrast, are all only special modifications of one general law, which I would call the *Law of Redintegration*;[2] that is, the principle according to which whatever has previously formed a part of one total act of consciousness, tends, when itself recalled into consciousness, to reproduce along with it the other parts of that original whole. But though these tendencies be denominated *laws*, the influence which they exert, though often strong and sometimes irresistible, is only contingent; for it frequently happens that thoughts which have previously stood to each other in one or other of the four relations do not suggest each other. The Laws of Association stand, therefore, on a very different footing from the laws of logical connection. But those Laws of Association, contingent though they be, exert a great and often a very pernicious influence upon thought, inasmuch as by the involuntary intrusion of representations into the mental chain which are wholly irrelevant to the matter in hand, there arises a perplexed and redundant tissue of thought, into which false characters may easily find admission, and in which true characters may easily be overlooked.[3] But this is not all. For, by being once blended together in our consciousness, things really distinct in their nature tend again naturally to reässociate, and, at every repetition of this conjunction, this tendency is fortified, and their mutual suggestion rendered more certain and irresistible.

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[1] Krug, *Logik*, § 144. Anm. — Ed.

[2] See *Lect. on Metaphysics*, p. 431 *et seq.* — Ed.

[3] Krug, *Logik*, § 144. Anm. — Ed.

Influence of Association in matters of Taste.

It is in virtue of this principle of Association and Custom, that things are clothed by us with the precarious attributes of deformity or beauty; and some philosophers have gone so far as to maintain that our principles of Taste are exclusively dependent on the accidents of Association. But if this be an exaggeration, it is impossible to deny that Association enjoys an extensive jurisdiction in the empire of taste, and, in particular, that fashion is almost wholly subject to its control.

Stewart quoted.

On this subject I may quote a few sentences from the first volume of Mr. Stewart's *Elements*. "In matters of Taste, the effects which we consider are produced on the mind itself, and are accompanied either with pleasure or with pain. Hence the tendency to casual association is much stronger than it commonly is with respect to physical events; and when such associations are once formed, as they do not lead to any important inconvenience, similar to those which result from physical mistakes, they are not so likely to be corrected by mere experience, unassisted by study. To this it is owing that the influence of association on our judgments concerning beauty and deformity, is still more remarkable than on our speculative conclusions; a circumstance which has led some philosophers to suppose that association is sufficient to account for the origin of these notions, and that there is no such thing as a standard of taste, founded on the principles of the human constitution. But this is undoubtedly pushing the theory a great deal too far. The association of ideas can never account for the origin of a new notion, or of a pleasure essentially different from all the others which we know. It may, indeed, enable us to conceive how a thing indifferent in itself may become a source of pleasure, by being connected in the mind with something else which is naturally agreeable; but it presupposes, in every instance, the existence of those notions and those feelings which it is its province to combine; insomuch that, I apprehend, it will be found, wherever association produces a change in our judgments on matters of taste, it does so by coöperating with some natural principle of the mind, and implies the existence of certain original sources of pleasure and uneasiness.

"A mode of dress, which at first appeared awkward, acquires, in a few weeks or months, the appearance of elegance. By being accustomed to see it worn by those whom we consider as models of taste, it becomes associated with the agreeable impressions which we receive from the ease and grace and refinement of their manners. When it pleases by itself, the effect is to be ascribed, not to the object actually before us, but to the impressions with which it has been generally connected, and which it naturally recalls to the mind.

"This observation points out the cause of the perpetual vicissitudes in dress, and in everything whose chief recommendation arises from fashion. It is evident that, as far as the agreeable effect of an ornament arises from association, the effect will continue only while it is confined to the higher orders. When it is adopted by the multitude, it not only ceases to be associated with ideas of taste and refinement, but it is associated with ideas of affectation, absurd imitation, and vulgarity. It is accordingly laid aside by the higher orders, who studiously avoid every circumstance in external appearance which is debased by low and common use; and they are led to exercise their invention in the introduction of some new peculiarities, which first become fashionable, then common, and last of all, are abandoned as vulgar."[1]

"Our moral judgments, too, may be modified, and even perverted to a certain degree, in consequence of the operation of the same principle. In the same manner in which a person who is regarded as a model of taste may introduce, by his example, an absurd or fantastical dress; so a man of splendid virtues may attract some esteem also to his imperfections; and, if placed in a conspicuous situation, may render his vices and follies objects of general imitation among the multitude.

"'In the reign of Charles II.,' says Mr. Smith,[2] 'a degree of licentiousness was deemed the characteristic of a liberal education. It was connected, according to the notions of those times, with generosity, sincerity, magnanimity, loyalty; and proved that the person who acted in this manner was a gentleman, and not a puritan. Severity of manners, and regularity of conduct, on the other hand, were altogether unfashionable, and were connected, in the imagination of that age, with cant, cunning, hypocrisy, and low manners. To superficial minds the vices of the great seem at all times agreeable. They connect them not only with the splendor of fortune, but with many superior virtues which they ascribe to their superiors;

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[1] *Elements*, vol. i., Part i. chap. v. *Collected Works*, ii. p. 322 *et seq.*

[2] *Theory of Moral Sentiments*, Part v. c. 2. — ED.

with the spirit of freedom and independency; with frankness, generosity, humanity, and politeness. The virtues of the inferior ranks of people, on the contrary, — their parsimonious frugality, their painful industry, and rigid adherence to rules, seem to them mean and disagreeable. They connect them both with the meanness of the station to which these qualities commonly belong, and with many great vices which they suppose usually accompany them; such as an abject, cowardly, ill-natured, lying, pilfering disposition.'"[1]

Condillac quoted on the influence of Association.

"In general," says Condillac, "the impression we experience in the different circumstances of life, makes us associate ideas with a force which renders them ever after for us indissoluble. We cannot, for example, frequent the society of our fellow-men without insensibly associating the notions of certain intellectual or moral qualities with certain corporeal characters. This is the reason why persons of a decided physiognomy please or displease us more than others; for a physiognomy is only an assemblage of characters, with which we have associated notions which are not suggested without an accompaniment of satisfaction or disgust. It is not, therefore, to be marvelled at that we judge men according to their physiognomy, and that we sometimes feel towards them at first sight aversion or inclination. In consequence of these associations, we are often vehemently prepossessed in favor of certain individuals, and no less violently disposed against others. It is because all that strikes us in our friends or in our enemies is associated with the agreeable or the disagreeable feeling which we severally experience; and because the faults of the former borrow always something pleasing from their amiable qualities; whereas the amiable qualities of the latter seem always to participate of their vices. Hence it is that these associations exert a powerful influence on our whole conduct. They foster our love or hatred; enhance our esteem or contempt; excite our gratitude or indignation; and produce those sympathies, — those antipathies, or those capricious inclinations, for which we are sometimes sorely puzzled to render a reason. Descartes tells us that through life he had always found a strong predilection for squint eyes, — which he explains by the circumstance, that the nursery-maid by whom he had been kindly tended, and to whom as a child he was, consequently, much attached, had this defect."[2] 'S Gravesande, I think it is, who tells us he knew a man, and a man otherwise of sense, who had a severe fall from a wagon; and thereafter he could never enter a wagon without fear and trembling, though he daily used, without apprehension, another and far more dangerous vehicle.[1] A girl once and again sees her mother or maid fainting and vociferating at the appearance of a mouse; if she has afterwards to escape from danger, she will rather pass through flames than take a patent way, if obstructed by a *ridiculus mus.* A remarkable example of the false judgments arising from this principle of association, is recorded by Herodotus and Justin, in reference to the war of the Scythians with their slaves. The slaves, after they had repeatedly repulsed several attacks with arms, were incontinently put to flight when their masters came out against them with their whips.[2]

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[1] *Elements*, vol. i. c. v, § 3. *Collected Works*, vol. ii. p. 335.

[2] *Origine des Connoissances Humaines*, sect ii. ch. ix. § 80. — Ed.

I shall now offer an observation in regard to the appropriate remedy for this evil influence of Association.

Only remedy for the influence of Association is the Philosophy of the Human Mind.

The only mean by which we can become aware of, counteract, and overcome, this besetting weakness of our nature, is Philosophy, — the Philosophy of the Human Mind; and this studied both in the consciousness of the individual, and in the history of the species. The philosophy of mind, as studied in the consciousness of the individual, exhibits to us the source and nature of the illusion. It accustoms us to discriminate the casual, from the necessary, combinations of thought; it sharpens and corroborates our faculties, encourages our reason to revolt against the blind preformations of opinion, and finally enables us to break through the enchanted circle within which Custom and Association had enclosed us. But in the accomplishment of this end. we are greatly aided by the study of man under the various circumstances which have concurred in modifying his intellectual and moral character. In the great spectacle of history, we behold in different ages and countries the predominance of different systems of association, and these ages and countries are, consequently, distinguished by the prevalence of different systems of opinions. But all is not fluctuating; and, amid the ceaseless changes of accidental circumstances and precarious beliefs, we behold some principles ever active, and some truths always commanding a recognition. We thus obtain the means of discriminating, in so far as our unassisted reason is conversant about mere worldly concerns, between what is of universal and necessary certainty, and what is only of local and temporary acceptation; and, in reference to the latter, in witnessing the influence of an arbitrary association in imposing the most irrational opinions on our fellow-men, our eyes are opened, and we are warned of the danger from the same illusion to ourselves. And as the philosophy of man affords us at once the indication and the remedy of this illusion, so the philosophy of man does this exclusively and alone. Our irrational associations, our habits of groundless credulity and of arbitrary skepticism, find no medicine in the study of aught beyond the domain of mind itself.

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[1] *Introductio ad Philosophiam, Logica*, c. 26. The example, however, is given as a supposed case, and not as a fact. The two instances which follow are also from 'S Gravesande. — Ed.

[2] Herod., iv. 3. Justin., ii. 5. — Ed.

As Goethe has well observed, "Mathematics remove no prejudice; they cannot mitigate obstinacy, or temper party-spirit;"[1] in a word, as to any moral influence upon the mind, they are absolutely null. Hence we may well explain the aversion of Socrates for these studies, if carried beyond a very limited extent.

The Representative Faculty, or Imagination Proper.

The next faculty in order is the Representative, or Imagination proper, which consists in the greater or less power of holding up an ideal object in the light of consciousness. The energy of Representation, though dependent on Retention and Reproduction, is not to be identified with these operations. For though these three functions (I mean Retention, Reproduction, and Representation) immediately suppose, and are immediately dependent on, each other, they are still manifestly discriminated as different qualities of mind, inasmuch as they stand to each other in no determinate proportion. We find, for example, in some individuals the capacity of Retention strong, but the Reproductive and Representative Faculties sluggish and weak. In others, again, the Conservative tenacity is feeble, but the Reproductive and Representative energies prompt and vivid; while in others the power of Reproduction may be vigorous, but what is recalled is never pictured in a clear and distinct consciousness. It will be generally, indeed, admitted, that a strong retentive memory does not infer a prompt recollection; and still more, that a strong memory and a prompt recollection do not infer a vivid imagination. These, therefore, though variously confounded by philosophers, we are warranted, I think, in viewing as elementary qualities of mind, which ought to be theoretically distinguished. Limiting, therefore, the term *Imagination* to the mere Faculty of Representing in a more or less vivacious manner an ideal object, — this Faculty is the source of errors which I shall comprise in the following paragraph.

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[1] *Werke*, xxii. p. 258. Quoted by Scheidler, *Psychologie*, p. 146.

Par. CII. 4. Imagination, — as a source of Error.

¶ CII. Imagination, or the Faculty of Representing with more or less vivacity a recalled object of cognition, is the source of Errors, both when it is too languid and when it is too vigorous. In the former case, the object is represented obscurely and indistinctly; in the latter, the ideal representation affords the illusive appearance of a sensible presentation.

Explication.

Necessity of Imagination in scientific pursuits.

A strong imagination, that is, the power of holding up any ideal object to the mind in clear and steady colors, is a faculty necessary to the poet and to the artist; but not to them alone. It is almost equally requisite for the successful cultivation of every scientific pursuit; and, though differently applied, and different in the character of its representation, it may well be doubted whether Aristotle did not possess as powerful an imagination as Homer. The vigor and perfection of this faculty is seen, not so much in the representation of individual objects and fragmentary sciences, as in the representation of systems. In the better ages of antiquity the perfection, the beauty, of all works of taste, whether in Poetry, Eloquence, Sculpture, Painting, or Music, was principally estimated from the symmetry or proportion of all the parts to each other, and to the whole which they together constituted; and it was only in subservience to this general harmony that the beauty of the several parts was appreciated. In the criticism of modern times, on the contrary, the reverse is true; and we are disposed to look more to the obtrusive qualities of details, than to the keeping and unison of a whole. Our works of art are, in general, like kinds of assorted patch-work; — not systems of parts all subdued in conformity to one ideal totality, but coördinations of independent fragments, among which a "*purpureus pannus*" seldom comes amiss. The reason of this difference in taste seems to be, what at first sight may seem the reverse, that in antiquity not the Reason but the Imagination was the more vigorous; — that the Imagination was able to represent simultaneously a more comprehensive system; and thus the several parts being regarded and valued only as conducive to the general result, — these parts never obtained that individual importance, which would have fallen to them had they been only created and only considered for themselves. Now this power of representing to the mind a complex system in all its bearings, is not less requisite to the philosopher

Diverse characteristics of Art in ancient and modern times.

than to the poet, though the representation be different in kind; and the nature of the philosophic representations, as not concrete and palpable like the poetical, supposes a more arduous operation, and, therefore, even a more vigorous faculty. But Imagination, in the one case and in the other, requires in proportion to its own power a powerful intellect; for imagination is not poetry nor philosophy, but only the condition of the one and of the other.

Errors which arise from the disproportion between Imagination and Judgment.

But to speak now of the Errors which arise from the disproportion between the Imagination and the Judgment; — they originate either in the weakness, or in the inordinate strength, of the former.

Those arising from the weakness of Imagination.

In regard to the errors which arise from the imbecility of the Representative Faculty, it is not difficult to conceive how this imbecility may become a cause of erroneous judgment. The Elaborative Faculty, in order to judge, requires an object, — requires certain differences to be given. Now, if the imagination be weak and languid, the objects represented by it will be given in such confusion and obscurity, that their differences are either null or evanescent, and judgment thus rendered either impossible, or possible only with the probability of error. In these circumstances, to secure itself from failure, the intellect must not attempt to rise above the actual presentations of sense; it must not attempt any ideal analysis or synthesis, — it must abandon all free and self-active elaboration, and all hope of a successful cultivation of knowledge.

From its disproportionate vivacity

Again, in regard to the opposite errors, those arising from the disproportioned vivacity of imagination, — these are equally apparent. In this case the renewed or newly-modified representations make an equal impression on the mind as the original presentations, and are, consequently, liable to be mistaken for these. Even during the perception of real objects, a too lively imagination mingles itself with the observation, which it thus corrupts and falsifies. Thus arises what is logically called the *vitium subreptionis*.[1] This is frequently seen in those pretended observations made by theorists in support of their hypotheses, in which, if even the possibility be left for imagination to interfere, imagination is sure to fill up all that the senses may leave vacant. In this case the observers are at once dupes and deceivers, in the words of Tacitus, "*Fingunt simul creduntque*."[2]

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[1] Krug, *Logik*, § 142 Anm. — ED.

[2] *Hist.* lib. ii c. 8. See *Lectures on Metaphysics*, p. 54. — ED.

Remedies for these defects of the Imagination.

In regard to the remedies for these defects of the Representative Faculty; — in the former case, the only alleviation that can be proposed for a feeble Imagination, is to animate it by the contemplation and study of those works of art which are the products of a strong Phantasy, and which tend to awaken in the student a corresponding energy of that faculty. On the other hand, a too powerful imagination is to be quelled and regulated by abstract thinking, and the study of philosophical, perhaps of mathematical, science.[1]

The faculty which next follows, is the Elaborative Faculty, Comparison, or the Faculty of Relations. This is the Understanding, in its three functions of Conception, Judgment, and Reasoning. On this faculty take the following paragraph.

Par. CIII. 5. Elaborative Faculty, — as a source of Error.

> ¶ CIII. The Affections and the Lower Cognitive Faculties afford the sources and occasions of error; but it is the Elaborative Faculty, Understanding, Comparison, or Judgment, which truly errs. This faculty does not, however, err from strength or over-activity, but from inaction; and this inaction arises either from natural weakness, from want of exercise, or from the impotence of attention.[2]

Explication.

Error does not lie in the conditions of our Higher Faculties, but is possible in the application of the laws of those faculties to determinate cases.

I formerly observed that error does not lie in the conditions of our higher faculties themselves, and that these faculties are not, by their own laws, determined to false judgments or conclusions:

> "Nam neque decipitur ratio, nec decipit unquam."[3]

If this were otherwise, all knowledge would be impossible, — the root of our nature would be a lie. "But in the application of the laws of our higher faculties to determinate cases, many errors are possible; and these errors may actually be occasioned by a variety of circumstances. Thus, it is a law of our intelligence, that no event, no phenomenon, can be thought as absolutely beginning to be; we cannot but think that all its constituent elements had a virtual existence prior to their concurrence, to necessitate its manifestation to us; we are thus unable to accord to it more than a relative commencement, in other words, we are constrained to look upon it as the effect of antecedent causes. Now though the law itself of our intelligence — that a cause there is for every event — be altogether exempt from error, yet in the application of this law to individual cases, that is, in the attribution of determinate causes to determinate effects, we are easily liable to go wrong. For we do not know, except from experience and induction, what particular antecedents are the causes of particular consequents; and if our knowledge of this relation be imperfectly generalized, or if we extend it by a false analogy to cases not included within our observation, error is the inevitable consequence. But in all this there is no fault, no failure, of intelligence, there is only a deficiency, — a deficiency in the activity of intelligence, while the Will determines us to a decision before the Understanding has become fully conscious of certainty. The defective action of the Understanding may arise from three causes. In the first place, the faculty of Judgment may by nature be too feeble. This is the case in idiots and weak persons. In the second place, though not by nature incompetent to judge, the intellect may be without the necessary experience, — may not possess the grounds on which a correct judgment must be founded. In the third place, — and this is the most frequent cause of error, — the failure of the understanding is from the incompetency of that act of will which is called *Attention*. Attention is the voluntary direction of the mind upon an object, with the intention of fully apprehending it. The cognitive energy is thus, as it were, concentrated upon a single point. We, therefore, say that the mind collects itself, when it begins to be attentive; on the contrary, that it is distracted, when its attention is not turned upon an object as it ought to be. This fixing — this concentration, of the mind upon an object can only be carried to a certain degree, and continued for a certain time. This degree and this continuance are both dependent upon bodily circumstances; and they are also frequently interrupted or suspended by the intrusion of certain collateral objects, which are forced upon the mind, either from without, by a strong and sudden impression upon the senses, or from within, through the influence of Association; and these, when once obtruded, gradually or at once divert the attention from the original and principal object. If we are not sufficiently attentive, or if the effort which accompanies the concentration of the mind upon a single object be irksome, there arises hurry and thoughtless-

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[1] Cf. Krug, *Logik*, § 156. Anm. — Ed.

[2] Krug, *Logik*, § 148. — Ed. [Cf. Fries, *Logik*, § 108 Bachmann, *Logik*, § 411.]

[3] See above, p. 389 — Ed.

Defective action of the Understanding may arise from three causes.

(a) Natural feebleness. (b) Want of necessary experience (c) Incompetency of attention.

ness in judging, inasmuch as we judge either before we have fully sought out the grounds on which our decision ought to proceed, or have competently examined their validity and effect. It is hence manifest that a multitude of errors is the inevitable consequence."[1]

6. Regulative Faculty, — not properly a source of Error.

In regard to the Regulative Faculty, — Common Sense, — Intelligence, — νοῦς, — this is not in itself a source of error. Errors may, however, arise either from overlooking the laws or necessary principles which it does contain; or by attributing to it, as necessary and original data, what are only contingent generalizations from experience, and, consequently, make no part of its complement of native truths. But these errors, it is evident, are not to be attributed to the Regulating Faculty itself, which is only a place or source of principles, but to the imperfect operations of the Understanding and Self-consciousness, in not properly observing and sifting the phenomena which it reveals.

Remote sources of Error in the different habits determinated by sex, age, bodily constitution, education, etc.

Besides these sources of Error, which immediately originate in the several powers and faculties of mind, there are others of a remoter origin arising from the different habits which are determined by the differences of sex,[2] of age,[3] of bodily constitution,[4] of education, of rank, of fortune, of profession. of intellectual pursuit. Of these, however, it is impossible at present to attempt an analysis; and I shall only endeavor to afford you a few specimens, and to refer you for information in regard to the others to the best sources.

Selected examples of these.

A one-sided cultivation of the intellectual powers.

This exemplified in three different phases.

Exclusive cultivation.

1. Of the powers of Observation.

Intellectual pursuits or favorite studies, inasmuch as these determine the mind to a one-sided cultivation, that is, to the neglect of some, and to the disproportioned development of other, of its faculties, are among the most remarkable causes of error. This partial or one-sided cultivation is exemplified in three different phases. The first of these is shown in the exclusive cultivation of the powers of Observation, to the neglect of the higher faculties of the Understanding. Of this type are your men of physical science. In this department of knowledge there is chiefly demanded a patient habit of attention to details, in order to detect phenomena, and, these discovered, their generalization is usually so easy that there is little exercise afforded to the higher energies of Judgment and Reasoning. It was Bacon's boast, that Induction, as applied to nature, would equalize all talents, level the aristocracy of genius, accomplish marvels by coöperation and method, and leave little to be done by the force of individual intellects. This boast has been fulfilled. Science has, by the Inductive Process, been brought down to minds, who previously would have been incompetent for its cultivation, and physical knowledge now usefully occupies many who would otherwise have been without any rational pursuit. But the exclusive devotion to such studies, if not combined with higher and graver speculations, tends to wean the student from the more vigorous efforts of mind, which, though unamusing and even irksome at the commencement, tend, however, to invigorate his nobler powers, and to prepare him for the final fruition of the highest happiness of his intellectual nature.

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[1] Krug, *Logik*, § 148. Anm. In some places slightly changed. — Ed.

[2] [See Stewart, *Elements*, vol. iii. part iii sect. v chap i. *Works*, vol. iv. p. 238 *et seq.*]

[3] [Aristotle, *Rhet.*, L. ii. c. 12. Crousaz, *Logique*, t. i. part i. sect. i. ch. v. § 15, p. 104.]

[4] [See Crousaz, *Logique*, t. i. p. i. sect. i. ch. v. p. 91 *et seq.*]

2. Of Metaphysics.
3. Of Mathematics.
Stewart referred to.

A partial cultivation of the intellect, opposite to this, is given in the exclusive cultivation of Metaphysics and of Mathematics. On this subject I may refer you to some observations of Mr. Stewart, in two chapters entitled *The Metaphysician* and *The Mathematician*, in the third volume of his *Elements of the Philosophy of the Human Mind*, — chapters distinguished equally by their candor and their depth of observation. On this subject Mr. Stewart's authority is of the highest, inasmuch as he was distinguished in both the departments of knowledge, the tendency of which he so well develops.

# LECTURE XXXI.

## MODIFIED STOICHEIOLOGY.

### SECTION II.—ERROR—ITS CAUSES AND REMEDIES.

### C.—LANGUAGE.—D.—OBJECTS OF KNOWLEDGE.

III. Language,—as a source of Error.

In my last Lecture, I concluded the survey of the Errors which have their origin in the conditions and circumstances of the several Cognitive Faculties, and now proceed to that source of false judgment which lies in the imperfection of the Instrument of thought and Communication,—I mean Language.

Has man invented Language? Ambiguity of the question.

Much controversy has arisen in regard to the question,—Has man invented Language? But the differences of opinion have in a great measure arisen from the ambiguity or complexity of the terms, in which the problem has been stated. By *language* we may mean either the power which man possesses of associating his thought with signs, or the particular systems of signs with which different portions of mankind have actually so associated their thoughts.

In what sense Language is natural to man

Taking *language* in the former sense, it is a natural faculty, an original tendency of mind, and, in this view, man has no more invented language than he has invented thought. In fact, the power of thought and the power of language are equally entitled to be considered as elementary qualities of intelligence; for while they are so different that they cannot be identified, they are still so reciprocally necessary that the one cannot exist without the other. It is true, indeed, that presentations and representations of given individual objects might have taken place, although there were no signs with which they were mentally connected, and by which they could be overtly expressed; but all complex and factitious constructions out of these given individual objects, in other words, all notions, concepts, general ideas, or thoughts proper, would have been impossible without an association to certain signs, by which their scattered elements might be combined in unity, and their vague and evanescent existence obtain a kind of definite and fixed and palpable reality. Speech and cogitation are thus the relative conditions of each other's activity, and both concur to the accomplishment of the same joint result. The Faculty of Thinking — the Faculty of forming General Notions — being given, this necessarily tends to energy, but the energy of thinking depends upon the coäctivity of the Faculty of Speech, which itself tends equally to energy. These faculties, — these tendencies, — these energies, thus coëxist and have always coëxisted; and the result of their combined action is thought in language, and language in thought. So much for the origin of Language, considered in general as a faculty.

Was the first language, actually spoken, the invention of man, or an inspiration of the Deity?

The latter hypothesis considered

Difficulty of the question.

But, though the Faculty of Speech be natural and necessary, that its manifestations are, to a certain extent, contingent and artificial, is evident from the simple fact, that there are more than a single language actually spoken. It may, therefore, be asked, — Was the first language, actually spoken, the invention of man, or an inspiration of the Deity? The latter hypothesis cuts, but does not loose the knot. It declares that ordinary causes and the laws of nature are insufficient to explain the phenomenon, but it does not prove this insufficiency; it thus violates the rule of Parcimony, by postulating a second and hypothetical cause to explain an effect, which it is not shown cannot be accounted for without this violent assumption. The first and greatest difficulty in the question is thus: — It is necessary to think in order to invent a language, and the invention of a language is necessary in order to think; for we cannot think without notions, and notions are only fixed by words.[1] This can only be solved, as I have said, by the natural attraction between thought and speech, — by their secret affinity, which is such that they suggest and, *pari passu*, accompany each other. And in regard to the question, — Why, if speech be a natural faculty, it does not manifest itself like other natural principles in a uniform manner, — it may be answered that the Faculty of Speech is controlled and modified in its exercise by external circumstances, in consequence of which, though its exertion be natural and necessary, and, therefore, identical in all men, the special forms of its exertion are in a great degree conventional and contingent, and, therefore, different among different portions of mankind.

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[1] See Rousseau, *Discours sur l'Origine de l' Inégalité parmi les Hommes.* Première Partie. "Si les hommes ont eu besoin de la parole pour apprendre à penser, ils ont eu bien plus besoin encore de savoir penser pour trouver l'art de la parole." — Ed.

Language has a general and a special character

Considered on one side, languages are the results of our intelligence and its immutable laws. In consequence of this, they exhibit in their progress and development resemblances and common characters which allow us to compare and to recall them to certain primitive and essential forms, — to evolve a system of Universal Grammar. Considered on another side, each language is the offspring of particular wants, of special circumstances, physical and moral, and of chance. Hence it is that every language has particular forms as it has peculiar words. Language thus bears the impress of human intelligence only in its general outlines. There is, therefore, to be found reason and philosophy in all languages, but we should be wrong in believing that reason and philosophy have, in any language, determined everything. No tongue, how perfect soever it may appear, is a complete and perfect instrument of human thought. From its very conditions every language must be imperfect. The human memory can only compass a limited complement of words, but the data of sense, and still more the combinations of the understanding, are wholly unlimited in number. No language can, therefore, be adequate to the ends for which it exists; all are imperfect, but some are far less incompetent instruments than others.

No language is a perfect instrument of thought.

From what has now been said, you will be prepared to find in Language one of the principal sources of Error; but before I go on to consider the particular modes in which the Imperfections of Language are the causes of false judgments, — I shall comprise the general doctrine in the following paragraph.

Par. CIV. Language, as a source of Error.

¶ CIV. As the human mind necessarily requires the aid of signs to elaborate, to fix, and to communicate its notions, and as Articulate Sounds are the species of signs which most effectually afford this aid, Speech is, therefore, an indispensable instrument in the higher functions of thought and knowledge. But as speech is a necessary, but not a perfect, instrument, its imperfection must reäct upon the mind. For the Multitude of Languages, the Difficulty of their Acquisition, their necessary Inadequacy, and the consequent Ambiguity of Words, both singly and in combination, — these are all copious sources of Illusion and Error.[1]

Explication.

Signs necessary for the internal operation of Thought.

And for the communication of Thought.

We have already sufficiently considered the reason why thought is dependent upon some system of signs or symbols both for its internal perfection and external expression.[2] The analyses and syntheses, — the decompositions and compositions, — in a word, the elaborations, performed by the Understanding upon the objects presented by External Perception and Self-Consciousness, and represented by Imagination, — these operations are faint and fugitive, and would have no existence, even for the conscious mind, beyond the moment of present consciousness, were we not able to connect, to ratify, and to fix them, by giving to their parts (which would otherwise immediately fall asunder) a permanent unity, by associating them with a sensible symbol, which we may always recall at pleasure, and which, when recalled, recalls along with it the characters which concur in constituting a notion or factitious object of intelligence. So far signs are necessary for the internal operation of thought itself. But for the communication of thought from one mind to another, signs are equally indispensable. For in itself thought is known, — thought is knowable, only to the thinking mind itself; and were we not enabled to connect certain complements of thought to certain sensible symbols, and by their means to suggest in other minds those complements of thought of which we were conscious in ourselves, we should never be able to communicate to others what engaged our interest, and man would remain for man, if an intelligence at all, a mere isolated intelligence.

In regard to the question, — What may these sensible symbols be, by which we are to compass such memorable effects, — it is needless to show that mien and gesture, which, to a certain extent, afford a kind of natural expression, are altogether inadequate to the double purpose of thought and communication, which it is here required to accomplish. This double purpose can be effected only

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[1] Krug, *Logik*, § 145. — ED. [Cf. Ernesti, *Initia Doctrinæ Solidioris: Pars Altera; Dialectica*, c. 2, § 24. Wyttenbach, *Præcepta Phil. Log.* P. iii. c iii p. 98. Tittel. *Logik*, p. 292. Kirwan, *Logick*, i. 214. Fries, *System der Logik*, § 109. Caro. *Logique*, Part. i. ch. i. art. 9, p. 121. Crousaz, Toussaint ] [Crousaz, *Logique*, t. iii. part i. sect. iii. c. 2. p 68 *et seq* Toussaint, *De la Pensée*. Chs. viii. x. — ED.]

[2] See above, p 430. — ED.

Intonations of the voice the only adequate sensible symbols of thought and its communication

These inarticulate and articulate

The latter constitute Language Proper

How Language is a source of Error.

by symbols, which express, through intonations of the voice, what is passing in the mind. These vocal intonations are either inarticulate or articulate. The former are mere sounds or cries; and, as such, an expression of the feelings of which the lower animals are also capable. The latter constitute words, and these, as the expression of thoughts or notions, constitute Language Proper or Speech.[1] Speech, as we have said, as the instrument of elaborating, fixing, and communicating our thoughts, is a principal mean of knowledge, and even the indispensable condition on which depends the exercise of our higher cognitive faculties. But, at the same time, in consequence of this very dependence of thought upon language, inasmuch as language is itself not perfect, the understanding is not only restrained in its operations, and its higher development, consequently, checked, but many occasions are given of positive error. For, to say nothing of the impediment presented to the free communication of thought by the multitude of tongues into which human language is divided, in consequence of which all speech beyond their mother-tongue is incomprehensible to those who do not make a study of other languages, — even the accurate learning of a single language is attended with such difficulties, that perhaps there never yet has been found an individual who was thoroughly acquainted with all the words and modes of verbal combination in any single language, — his mother-tongue even not excepted. But the circumstance of principal importance is, that how copious and expressive soever it may be, no language is competent adequately to denote all possible notions, and all possible relations of notions, and from this necessary poverty of language in all its different degrees, a certain inevitable ambiguity arises, both in the employment of single words and of words in mutual connection.

The ambiguity of words the principal source of error originating in Language.

Two circumstances under this head which mutually affect each other

As this is the principal source of the error originating in Language, it will be proper to be a little more explicit. And here it is expedient to take into account two circumstances, which mutually affect each other. The first is, that as the vocabulary of every language is necessarily finite, it is necessarily disproportioned to the multiplicity, not to say infinity, of thought; and the second, that the complement of words in any given language has been always filled up with terms significant of objects and relations of the external world, before the want was experienced of words to express the objects and relations of the internal.

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[1] Cf. Krug, *Logik*, § 145. Anm. — Ed.

The vocabulary of every language necessarily finite. Consequences of this.

From the first of these circumstances, considered exclusively and by itself, it is manifest that one of two alternatives must take place. Either the words of a language must each designate only a single notion, — a single fasciculus of thought, — the multitude of notions not designated being allowed to perish, never obtaining more than a momentary existence in the mind of the individual; or the words of a language must each be employed to denote a plurality of concepts. In the former case, a small amount of thought would be expressed, but that precisely and without ambiguity; in the latter, a large amount of thought would be expressed, but that vaguely and equivocally. Of these alternatives (each of which has thus its advantages and disadvantages), the latter is the one which has universally been preferred; and, accordingly, all languages by the same word express a multitude of thoughts, more or less differing from each other. Now, what is the consequence of this? It is plain that if a word has more than a single meaning attached to it, when it is employed it cannot of itself directly and peremptorily suggest any definite thought; — all that it can do is vaguely and hypothetically to suggest a variety of different notions; and we are obliged from a consideration of the context, — of the tenor, — of the general analogy, of the discourse, to surmise, with greater or less assurance, with greater or less precision, what particular bundle of characters it was intended to convey.

Words are merely hints to the mind.

Words, in fact, as languages are constituted, do nothing more than suggest, — are nothing more than hints; hints, likewise, which leave the principal part of the process of interpretation to be performed by the mind of the hearer. In this respect, the effect of words resembles the effect of an outline or shade of a countenance with which we are familiar. In both cases, the mind is stimulated to fill up what is only hinted or pointed at. Thus it is that the function of language is not so much to infuse knowledge from one intelligence to another, as to bring two minds into the same train of thinking, and to confine them to the same track. In this procedure what is chiefly wonderful, is the rapidity with which the mind compares the word with its correlations, and in general, without the slightest effort, decides which among its various meanings is the one which it is here intended to convey. But how marvellous soever be the ease and velocity of this process of selection, it cannot always be performed with equal certainty. Words are often employed with a plurality of meanings; several of which may quadrate, or be supposed to quadrate, with the general tenor of the discourse. Error is thus possible; and it is also probable, if we have any prepossession in favor of one interpretation rather than of another. So copious a source of error is the ambiguity of language, that a very large proportion of human controversy has been concerning the sense in which certain terms should be understood; and many disputes have even been fiercely waged, in consequence of the disputants being unaware that they agreed in opinion, and only differed in the meaning they attached to the words in which that opinion was expressed. On this subject I may refer you to the very amusing and very instructive treatise of Werenfelsius, entitled *De Logomachiis Eruditorum*.

Remedy for error arising from Language.

"In regard to a remedy for this description of error, — this lies exclusively in a thorough study of the language employed in the communication of knowledge, and in an acquaintance with the rules of Criticism and Interpretation. The study of languages, when rationally pursued, is not so unimportant as many fondly conceive; for misconceptions most frequently arise solely from an ignorance of words; and every language may, in a certain sort, be viewed as a commentary upon Logic, inasmuch as every language, in like manner, mirrors in itself the laws of thought.

"In reference to the rules of Criticism and Interpretation, — these especially should be familiar to those who make a study of the writings of ancient authors, as these writings have descended to us often in a very mutilated state, and are composed in languages which are now dead. How many theological errors, for example, have only arisen because the divines were either ignorant of the principles of Criticism and Hermeneutic, or did not properly apply them! Doctrines originating in a corrupted lection, or in a figurative expression, have thus arisen and been keenly defended. Such errors are best combated by philological weapons; for these pull them up along with their roots.

"A thorough knowledge of languages in general accustoms the mind not to remain satisfied with the husk, but to penetrate in, even to the kernel. With this knowledge we shall not so easily imagine that we understand a system, when we only possess the language in which it is expressed; we shall not conceive that we truly reason, when we only employ certain empty words and formulæ; we shall not betray ourselves into unusual and obscure expressions, under which our meaning may be easily mistaken; finally, we shall not dispute with others about words, when we are in fact at one with them in regard to things."[1] So much for the errors which originate in Language.

IV. Source of Error, — the Objects of our Knowledge.

As to the last source of Error which I enumerated, — the Objects themselves of our knowledge, — it is hardly necessary to say anything. It is evident that some matters are obscure and abstruse, while others are clear and palpable; and that, consequently, the probability of error is greater in some studies than it is in others. But as it is impossible to deliver any special rules for these cases, different from those which are given for the Acquisition of Knowledge in general, concerning which we are soon to speak, — this source of error may be, therefore, passed over in silence.

We have now thus finished the consideration of the various Sources of Error, and —

Par. CV. Rules touching the Causes and Remedies of our False Judgments.

¶ CV. The following rules may be given, as the results of the foregoing discussion, touching the Causes and Remedies of our False Judgments.

1°. Endeavor as far as possible to obtain a clear and thorough insight into the laws of the Understanding, and of the Mental Faculties in general. Study Logic and Psychology.

2°. Assiduously exercise your mind in the application of these laws. Learn to think methodically.

3°. Concentrate your attention in the act of Thinking; and principally employ the seasons when the Intellect is alert, the Passions slumbering, and no external causes of distraction at work.

4°. Carefully eliminate all foreign interests from the objects of your inquiry, and allow yourselves to be actuated by the interest of Truth alone.

5°. Contrast your various convictions, your past and present judgments, with each other; and admit no conclusion as certain, until it has been once and again thoroughly examined, and its correctness ascertained.

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[1] Krug, *Logik*, § 157. Anm. — Ed.

6°. Collate your own persuasions with those of others; attentively listen to and weigh, without prepossession, the judgments formed by others of the opinions which you yourselves maintain.[1]

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[1] Cf. Krug, *Logik*, § 160. Bachmann, *Logik*, § 416. — Ed.

# LECTURE XXXII.

## MODIFIED METHODOLOGY.

## SECTION I.—OF THE ACQUISITION OF KNOWLEDGE

### I. EXPERIENCE.—A. PERSONAL:—OBSERVATION—INDUCTION AND ANALOGY.

Means by which our knowledge obtains the character of Perfection, viz., the Acquisition and the Communication of Knowledge.

In our last Lecture, having concluded the Second Department of Concrete Logic,—that which treats of the Causes of Error, we now enter upon the Third part of Concrete or Modified Logic,—that which considers the Means by which our Knowledge obtains the character of Perfection. These means may, in general, be regarded as two,—the Acquisition and the Communication of knowledge,—and these two means we shall, accordingly, consider consecutively and apart.

The acquisition of Knowledge.

In regard to the Acquisition of Knowledge,—we must consider this by reference to the different kinds of knowledge of which the human intellect is capable. And this, viewed in its greatest universality, is of two species.

Human Knowledge of two kinds.

Human knowledge, I say, viewed in its greatest universality, is of two kinds. For either it is one of which the objects are given as contingent phænomena, or one in which the objects are given as necessary facts or laws. In the former case, the cognitions are called *empirical*, *experiential*, or *of experience;* in the latter, *pure*, *intuitive*, *rational*, or *of reason*, also *of common sense.* These two kinds of knowledge are, likewise, severally denominated *cognitions a posteriori* and *cognitions a priori.* The distinction of these two species of cognitions consists properly in this,—that the former are solely derived from the Presentations of Sense, External and Internal; whereas the latter, though first manifested on the occasion of such Presentations, are not, however, mere products of Sense; on the contrary, they are laws, principles, forms, notions, or by whatever name they may be called, native and original to the mind, that is, founded in, or constituting the very nature of, Intelligence; and, accordingly, out of the mind itself they must be developed, and not sought for and acquired as foreign and accidental acquisitions. As the Presentative Faculties inform us only of what exists and what happens, that is, only of facts and events, — such empirical knowledge constitutes no necessary and universal judgment; all, in this case, is contingent and particular, for even our generalized knowledge has only a relative and precarious universality. The cognitions, on the other hand, which are given as Laws of Mind, are, at once and in themselves, universal and necessary. We cannot but think them, if we think at all. The doctrine, therefore, of the Acquisition of Knowledge, must consist of two parts, — the first treating of the acquisition of knowledge through the data of Experience, the second, of the acquisition of knowledge through the data of Intelligence.[1]

Doctrine of the Acquisition of Knowledge consists of two parts.

I. The Doctrine of Experience. Experience of two kinds.

In regard to the first of these sources, viz., Experience, — this is either our own experience or the experience of others, and in either case it is for us a mean of knowledge. It is manifest that the knowledge we acquire through our personal experience, is far superior in degree to that which we obtain through the experience of other men; inasmuch as our knowledge of an object, in the former case, is far clearer and more distinct, far more complete and lively, than in the latter; while at the same time the latter also affords us a far inferior conviction of the correctness and certainty of the cognition than the former. On the other hand, foreign is far superior to our proper experience in this, — that it is much more comprehensive, and that, without this, man would be deprived of those branches of knowledge which are to him of the most indispensable importance. Now, as the principal distinction of experience is thus into our own experience and into the experience of others, we must consider it more closely in this twofold relation.[2] First, then, of our Personal Experience.

Experience necessarily supposes, as its primary condition, certain presentations by the faculties of External or of Internal Perception, and is, therefore, of two kinds, according as it is conversant about the objects of the one of these faculties, or the objects of the other. But the presentation of a fact of the external or of the internal world is not at once an experience. To this there is required a continued series of such presentations, a comparison of these together, a mental separation of the different, a mental combination of the similar, and it, therefore, over and above the operation of the Presentative Faculties, requires the coöperation of the Retentive, the Reproductive, the Representative, and the Elaborative Faculties. In regard to Experience, as the first means by which we acquire knowledge through the legitimate use and application of our Cognitive Faculties, I give you the following paragraph:

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[1] See Esser, *Logik*, § 145. — Ed. In regard to the acquisition of knowledge, — all knowledge may be called *acquired*, inasmuch as it is acquired either, 1°, By experience; or, 2°, On occasion of experience.

[2] Esser, *Logik*, § 146. — Ed.

1. Personal Experience

Par. CVI. Experience; what, — in general.

¶ CVI. The First Mean towards the Acquisition of Knowledge is *Experience* (*experientia*, ἐμπειρία). Experience may be, rudely and generally, described as the apprehension of the phænomena of the outer world, presented by the Faculty of External Perception, and of the phænomena of the inner world, presented by the Faculty of Self-consciousness; — these phænomena being retained in Memory, ready for Reproduction and Representation, being also arranged into order by the Understanding.

Explication.

This paragraph, you will remark, affords only a preliminary view of the general conditions of Experience. In the first place, it is evident, that without the Presentative, or, as they may with equal propriety be called, the Acquisitive, Faculties of Perception, External and Internal, no experience would be possible. But these faculties, though affording the fundamental condition of knowledge, do not of themselves make up experience. There is, moreover, required of the phænomena or appearances the accumulation and retention, the reproduction and representation. Memory, Reminiscence, and Imagination must, therefore, also coöperate. Finally, unless the phænomena be compared together, and be arranged into classes, according to their similarities and differences, it is evident that no judgments, — no conclusions, can be formed concerning them; but without a judgment knowledge is impossible; and as experience is a knowledge, consequently experience is impossible. The Understanding or Elaborative Faculty must, therefore, likewise coöperate. Manilius has well expressed the nature of experience in the following lines.

> "Per varios usus artem experientia fecit,
> Exemplo monstrante viam."[1]

And Afranius in the others:

> "Usus me genuit, mater peperit Memoria;
> Sophiam vocant me Graii, vos Sapientiam."[2]

Common and Scientific Experience.

"Our own observation, be it external or internal, is either with, or without, intention; and it consists either of a series of Presentations alone, or Abstraction and Reflection supervene, so that the presentations obtain that completion and system which they do not of themselves possess. In the former case, the experience may be called an *Unlearned* or a *Common;* in the latter, a *Learned* or *Scientific Experience.* Intentional and reflective experience is called *Observation.* Observation is of two kinds; for either the objects which it considers remain unchanged, or, previous to its application, they are made to undergo certain arbitrary changes, or are placed in certain factitious relations. In the latter case, the observation contains the specific name of *Experiment.* Observation and experiment do not, therefore, constitute opposite or two different procedures, — the latter is, in propriety, only a certain subordinate modification of the former; for, while observation may accomplish its end without experiment, experiment without observation is impossible. Observation and experiment are manifestly exclusively competent upon the objects of our empirical knowledge; and they coöperate, equally and in like manner, to the progress of that knowledge, partly by establishing, partly by correcting, partly by amplifying it. Under observation, therefore, is not to be understood a common or unlearned experience, which obtrudes itself upon every one endowed with the ordinary faculties of Sense and Understanding, but an intentional and continued application of the faculties of Perception, combined with an abstractive and reflective attention to an object or class of objects, a more accurate knowledge of which, it is proposed, by the observation, to accomplish. But in order that the observation should accomplish this end, — more especially when the objects are

Observation, — what. Of two kinds, — Observation Proper, and Experiment.

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[1] I. 61.

[2] *Fragmentum e Sella.* Vide *Corpus Poetarum Latinorum*, vol. ii. p. 1513, Lond. 1713. — Ed

numerous, and a systematic complement of cognitions is the end proposed, — it is necessary that we should know certain præcognita, — 1°. What we ought to observe; 2°. How we ought to observe; and 3°. By what means are the data of observation to be reduced to system. The first of these concerns the Object; the second, the Procedure; the third, the scientific Completion, of the observations. It is proper to make some general observations in regard to these, in their order; and first, of the Object of observation, — the *what* we ought to observe.

Præcognita of Observation.

First, — The Object of Observation.
This fourfold.

"The Object of Observation can only be some given and determinate phænomenon, and this phænomenon either an external or an internal. Through observation, whether external or internal, there are four several cognitions which we propose to compass, — viz., to ascertain — 1°. What the Phænomena themselves are; 2°. What are the Conditions of their Reality; 3°. What are the Causes of their Existence; 4°. What is the Order of their Consecution.

1°. What the Phænomena are.

In their individual peculiarities and contrasts.

"In regard to what the phænomena themselves are (*quid sint*), that is, in regard to what constitutes their peculiar nature, — this, it is evident, must be the primary matter of consideration, it being always supposed that the fact (the *an sit*) of the phænomenon itself has been established.[1] To this there is required, above all, a clear and distinct Presentation or Representation of the object. In order to obtain this, it behooves us to analyze, — to dismember, the constituent parts of the object, and to take into proximate account those characters which constitute the object, that is, which make it to be what it is, and nothing but what it is. This being performed, we must proceed to compare it with other objects, and with those especially which bear to it the strongest similarity, taking accurate note always of those points in which they reciprocally resemble and in which they reciprocally disagree.

As under determinate genera and species.

"But it is not enough to consider the several phænomena in their individual peculiarities and contrasts, — in what they are, and in what they are not, — it is also requisite to bring them under determinate genera and species. To this end we must, having obtained (as previously prescribed) a clear and distinct knowledge of the several phænomena in their essential similarities and differences, look away or abstract from the latter, — the differences, and comprehend the former, — the similarities, in a compendious and characteristic notion, under an appropriate name.

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[1] Better the Aristotelic questions, — *An Sit*, etc. [See *Lectures on Metaphysics*, p. 41. — Ed.]

2°. What the Conditions of their Reality.

"When the distinctive peculiarities of the phænomena have been thus definitively recognized, the second question emerges, — What are the Conditions of their Reality. These conditions are commonly called *Requisites*, and under *requisite* we must understand all that must have preceded, before the phænomena could follow. In order to discover the requisites, we take a number of analogous cases, or cases similar in kind, and inquire what are the circumstances under which the phænomenon always arises, if it does arise, and what are the circumstances under which it never arises; and then, after a competent observation of individual cases, we construct the general judgment, that the phænomenon never occurs unless this or that other phænomenon has preceded, or at least accompanied, it. Here, however, it must be noticed, that nothing can be viewed as a requisite which admits of any, even the smallest, exception.

3°. What the Causes of the Phænomena.

"The requisite conditions being discovered, the third question arises, — What are the Causes of the Phænomena. According to the current doctrine, the *causes* of phænomena are not to be confounded with their *requisites;* for although a phænomenon no more occurs without its requisite than without its cause, still, the requisite being given, the phænomenon does not necessarily follow, and, indeed, very frequently does not ensue. On the contrary, if the cause occurs, the phænomenon must occur also. In other words, the requisite or condition is that without which the phænomenon never is; the cause, on the other hand, is that through which it always is. Thus an emotion of pity never arises without a knowledge of the misfortune of another; but so little does this knowledge necessitate that emotion, that its opposite, a feeling of rejoicing, complacency, at such suffering may ensue; whereas the knowledge of another's misfortune must be followed by a sentiment of pity, if we are predisposed in favor of the person to whom the misfortune has occurred. In this view, the knowledge of another's misfortune is only a requisite; whereas our favorable predisposition constitutes the cause. It must, however, be admitted, that in different relations one and the same circumstance may be both requisite and cause;"[1] and, in point of fact, it would be more correct to consider the cause as the whole sum of antecedents, without which the phænomenon never does take place, and with which it always must.

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[1] Esser, *Logik*, § 148. — Ed.

What are commonly called *requisites*, are thus, in truth, only partial causes; what are called *causes*, only proximate requisites.

4°. What the Order of their Consecution.

"In the fourth place, having ascertained the essential qualities, — the Conditions and the Causes of phænomena, — a final question emerges, — What is the Order in which they are manifested? and this being ascertained, the observation has accomplished its end. This question applies either to a phænomenon considered in itself, or to a phænomenon considered in relation to others. In relation to itself, the question concerns only the time of its origin, of its continuance, and of its termination; in relation to others, it concerns the reciprocal consecation in which the several phænomena appear."[1]

Second, — The Manner of Observation

"We now go on to the Second Præcognitum, — the Manner of Observation, — How we are to observe. What we have hitherto spoken of — the Object — can be known only in one way, — the way of Scientific Observation. It therefore remains to be asked, — How must the observation be instituted, so as to afford us a satisfactory result in regard to all the four sides on which it behooves an object to be observed? In the first place, as preliminary to observation, it is required that the observing mind be tranquil and composed, be exempt from prejudice, partiality, and prepossession, and be actuated by no other interest than the discovery of truth. Tranquillity and composure of mind are of peculiar importance in our observation of the phænomena of the internal world; for these phænomena are not, like those of the external, perceptible by sense, enclosed in space, continuous and divisible; and they follow each other in such numbers, and with such a rapidity, that they are at best observable with difficulty, often losing even their existence by the interference of the observing, — the reflective energy, itself. But that the observation should be always conducted in the calm and collected state of mind required to purify this condition, we must be careful to obtain, more and more, a mastery over the Attention, so as to turn it with full force upon a single aspect of the phænomena, and, consequently, to abstract it altogether from every other. Its proper function is to contemplate the objects of observation tranquilly, continuously, and without anxiety for the result; and this, likewise, without too intense an activity or too vigorous an application of its forces. But the observation and concomitant energy of attention will be without result, unless we previously well consider what precise object or objects we are now to observe. Nor will our experience

1°. Proper state of the observing mind.

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[1] Esser, *Logik*, § 148. — ED.

obtain an answer to the question proposed for it to solve, unless that question be of such a nature as will animate the observing faculties by some stimulus, and give them a determinate direction. Where this is not the case, attention does not effect anything, nay, it does not operate at all. On this account such psychological questions as the following: What takes place in the process of Self-consciousness, — of Perception, — of Vision, — of Hearing, — of Imagination, etc., — cannot be answered, as thus absolutely stated, that is, without reference to some determinate object. But if I propose the problem, — What takes place when I see this or that object, or better still, when I see this table, — the attention is stimulated and directed, and even a child can give responses, which, if properly illustrated and explained, will afford a solution to the problem. If, therefore, the question upon the object of observation be too vague and general, so that the attention is not suitably excited and applied, — this question must be divided and subdivided into others more particular, and this process must be continued until we reach a question which affords the requisite conditions. We should, therefore, determine as closely as possible the object itself and the phases in which we wish to observe it, separate from it all foreign or adventitious parts, resolve every question into its constituent elements, enunciate each of these as specially as possible, and never couch it in vague and general expressions. But here we must at the same time take care that the object be not so torn and mangled that the attention feels no longer any attraction to the several parts, or that the several parts can no longer be viewed in their natural connection. So much it is possible to say in general, touching the Manner in which observation ought to be carried on; what may further be added under this head, depends upon the particular nature of the objects to be observed."[1]

2°. Conditions of the question to be determined by the observation

"In this manner, then, must we proceed, until all has been accomplished which the problem, to be answered by the observation, pointed out. When the observation is concluded, an accurate record or notation of what has been observed is of use, in order to enable us to supply what is found wanting in our subsequent observation. If we have accumulated a considerable apparatus of results, in relation to the object we observe, it is proper to take a survey of these; from what is found defective, new questions must be evolved, and an answer to these sought out through new observations. When the inquiry has attained its issue, a tabular view of all the observations made upon the subject is convenient, to afford a conspectus of the whole, and as an aid to the memory. But how (and this is the Third Precognition) individual observations are to be built up into a systematic whole, is to be sought for partly from the nature of science in general, partly from the nature of the particular empirical science for the constitution of which the observation is applied. Nor is what is thus sought difficult to find. It is at once evident, that a synthetic arrangement is least applicable in the empirical sciences. For, anterior to observation, the object is absolutely unknown; and it is only through observation that it becomes a matter of science. We can, therefore, only go to work in a problematic or interrogative manner, and it is impossible to commence by assertory propositions, of which we afterwards lead the demonstration. We must, therefore, determine the object on all sides, in so far as observation is competent to this; we must analyze every question into its subordinate questions, and each of these must find its answer in observation. The systematic order is thus given naturally and of itself; and in this procedure it is impossible that it should not be given. But for a comprehensive and all-sided system of empirical knowledge, it is not sufficient to possess the whole data of observation, to have collected these together, and to have arranged them according to some external principle; it is, likewise, requisite that we have a thorough-going principle of explanation, even though this explanation be impossible in the way of observation, and a power of judging of the data, according to universal laws, although these universal laws may not be discovered by experience alone. These two ends are accomplished by different means. The former we compass by the aid of Hypothesis, the latter, by the aid of Induction and Analogy."[1] Of these in detail. In regard to Hypothesis, I give you the following paragraph.

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[1] Esser. *Logik*, § 149 — ED

Third, — The means by which the data of Observation are to be reduced to System.

¶ CVII. When a phænomenon is presented, which can be explained by no principle afforded through Experience, we feel discontented and uneasy; and there arises an effort to discover some cause which may, at least provisorily, account for the outstanding phænomenon; and this cause is finally recognized as valid and true, if, through it, the given phænomenon is

Par. CVII. Hypothesis, — what.

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[1] Esser, *Logik*, § 150. — ED.

found to obtain a full and perfect explanation. The judgment in which a phænomenon is referred to such a problematic cause, is called an *Hypothesis*.[1]

Explication. Hypothesis,—its end.

Hypotheses have thus no other end than to satisfy the desire of the mind to reduce the objects of its knowledge to unity and system; and they do this in recalling them, *ad interim*, to some principle, through which the mind is enabled to comprehend them. From this view of their nature, it is manifest how far they are permissible, and how far they are even useful and expedient; throwing altogether out of account the possibility, that what is at first assumed as hypothetical, may, subsequently, be proved true.

When our experience has revealed to us a certain correspondence among a number of objects, we are determined, by an original principle of our nature, to suppose the existence of a more extensive correspondence than our observation has already proved, or may ever be able to establish. This tendency to generalize our knowledge by the judgment,—that where much has been found accordant, all will be found accordant,—is not properly a conclusion deduced from premises, but an original principle of our nature, which we may call that of *Logical*, or perhaps better, that of *Philosophical*, *Presumption*. This Presumption is of two kinds; it is either Induction or Analogy, which, though usually confounded, are, however, to be carefully distinguished. I shall commence the consideration of these by the following paragraph.

Par CVIII. Induction and Analogy.

¶ CVIII. If we have uniformly observed that a number of objects of the same class (genus or species) possess in common a certain attribute, we are disposed to conclude that this attribute is possessed by all the objects of that class. This conclusion is properly called an *Inference of Induction*. Again, if we have observed that two or more things agree in several internal and essential characters, we are disposed to conclude that they agree, likewise, in all other essential characters, that is, that they are constituents of the same class (genus or species). This conclusion is properly called an *Inference of Analogy*. The principle by which, in either case, we are disposed to extend our inferences beyond the limits of experience, is a natural or ultimate principle of intelligence; and may be called the principle of *Logical*, or, more properly, of *Philosophical Presumption*.[1]

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[1] Esser, *Logik*, § 151. Cf. *Lectures on Metaphysics*, p 117 *et seq.* — Ed.

Explication.

Induction and Analogy, — their agreement and difference.

"The reasoning by Induction and the reasoning by Analogy have this in common, that they both conclude from something observed to something not observed; from something within to something beyond the sphere of actual experience. They differ, however, in this, that, in Induction, that which is observed and from which the inference is drawn to that which is not observed, is a unity in plurality; whereas, in Analogy, it is a plurality in unity. In other words, in Induction, we look to the one in the many; in Analogy we look to the many in the one: and while in both we conclude to the unity in totality, we do this, in Induction, from the recognized unity in plurality, in Analogy, from the recognized plurality in unity. Thus, as induction rests upon the principle, that what belongs (or does not belong) to many things of the same kind, belongs (or does not belong) to all things of the same kind; so analogy rests upon the principle, — that things which have many observed attributes in common, have other not observed attributes in common likewise."[2] It is hardly necessary to remark that we are now speaking of Induction and Analogy, not as principles of Pure Logic, and as necessitated by the fundamental laws of thought, but of these as means of acquiring knowledge, and as legitimated by the conditions of objective reality. In Pure Logic, Analogy has no place, and only that induction is admitted, in which all the several parts are supposed to legitimate the inference to the whole. Applied Induction, on the contrary, rests on the constancy, — the uniformity of nature, and on the instinctive expectation we have of this stability. This constitutes what has been called the principle of *Logical Presumption*, though perhaps it might, with greater propriety, be called the principle of *Philosophical Presumption*. We shall now consider these severally; and, first, of Induction.

Induction. — what.

An Induction is the enumeration of the parts, in order to *legitimate* a judgment in regard to the whole.[3] Now, the parts may either be individuals or particulars, strictly so called. I say strictly so called, for you are aware

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[1] Cf. Esser, *Logik*, §§ 140, 152. Krug, *Logik*, §§ 166, 167, 168. — Ed. [Wolf, *Phil. Rationalis*, § 479. Rensch, *Systema Logicum*, §§ 572, 573. Nunnesius, *De Constitutione Artis Dialecticæ*, p. 126.]

[2] Esser, *Logik*, § 152. — Ed.

[3] [Cf. *Abu Ali (Avicennæ) Viri Docti, De Logica, Poema*, l. 190. (In Schmölders, *Documenta Philosophiæ Arabum*, p. 36.) Bonnæ, 1836. Zabarella, *Opera Logica, De Natura Logicæ*, L. i. c 18, p. 45.]

Of two kinds, — Individual and Special

that the term *particular* is very commonly employed, not only to denote the species, as contained under a genus, but, likewise, to denote the individual, as contained under a species. Using, however, the two terms in their proper significations, I say, if the parts are individual or singular things, the induction is then called *Individual:* whereas if the parts be species or subaltern genera, the induction then obtains the name of *Special.* An example of the Individual Induction is given, were we to argue thus, — *Mercury, Venus, the Earth, Mars, etc., are bodies in themselves opaque, and which borrow their light from the sun. But Mercury*, *Venus*, *etc., are planets. Therefore, all planets are opaque, and borrow their light from the sun.* An example of the special is given, were we to argue as follows, — *Quadrupeds, birds, fishes, the amphibia, etc., all have a nervous system. But quadrupeds, birds, etc., are animals. Therefore all animals* (though it is not yet detected in some) *have a nervous system.* Now, here it is manifest that Special rests upon Individual induction, and that, in the last result, all induction is individual. For we can assert nothing concerning species, unless what we assert of them has been previously observed in their constituent singulars.[1]

The two conditions of legitimate Induction. — First.

For a legitimate Induction there are requisite at least two conditions.[2] In the first place, it is necessary, That the partial (and this word I use as including both the terms *individual* and *particular*), — I say, it is necessary that the partial judgments out of which the total or general judgment is inferred, be all of the same quality. For if one even of the partial judgments had an opposite quality, the whole induction would be subverted. Hence it is that we refute universal judgments founded on an imperfect induction, by bringing what is called an instance (*instantia*), that is, by adducing a thing belonging to the same class or notion, in reference to which the opposite holds true. For example, the general assertion, *All dogs bark*, is refuted by the instance of the dogs of Labrador or California (I forget which), — these do not bark. In like manner, the general assertion, *No quadruped is oviparous*, is refuted by the instance of the *Ornithorhynchus Paradoxus.* But that the universal judgment must have the same quality as the partial, is self-evident; for this judgment is simply the assertion of something to be true of all which is true of many.

The second condition required is, That a competent number of the partial objects from which the induction departs should have been observed, for otherwise the comprehension of other objects under the total judgment would be rash.[1] What is the number of such objects, which amounts to a competent induction, it is not possible to say in general. In some cases, the observation of a very few particular or individual examples is sufficient to warrant an assertion in regard to the whole class; in others, the total judgment is hardly competent, until our observation has gone through each of its constituent parts. This distinction is founded on the difference of essential and unessential characters. If the character be essential to the several objects, a comparatively limited observation is necessary to legitimate our general conclusion. For example, it would require a far less induction to prove that all animals breathe, than to prove that the mammalia, and the mammalia alone, have lateral lobes to the cerebellum. For the one is seen to be a function necessary to animal life; the other, as far as our present knowledge reaches, appears only as an arbitrary concomitant. The difference of essential and accidental is, however, one itself founded on induction, and varies according to the greater or less perfection to which this has been carried. In the progress of science, the lateral lobes of the cerebellum may appear to future physiologists as necessary a condition of the function of suckling their young, as the organs of breathing appear to us of circulation and of life.

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[1] Krug, *Logik*, § 167. Anm. — Ed.

[2] Esser, *Logik*, § 152. — Ed.

Second

Summary of the doctrine of Induction.

To sum up the Doctrine of Induction, — "This is more certain, 1°, In proportion to the number and diversity of the objects observed; — 2°, In proportion to the accuracy with which the observation and comparison have been conducted; — 3°, In proportion as the agreement of the objects is clear and precise; — and, 4°, In proportion as it has been thoroughly explored, whether there exist exceptions or not."[2]

Almost all induction is, however, necessarily imperfect; and Logic can inculcate nothing more important on the investigators of nature than that sobriety of mind, which regards all its past observations only as hypothetically true, only as relatively complete, and which, consequently, holds the mind open to every new observation, which may correct and limit its former judgments.

Analogy, — what.

So much for Induction; now for Analogy. Analogy, in general, means proportion, or a similarity of relations. Thus, to judge analogically, or according to analogy, is to judge things by the similarity of their relations.

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[1] Esser, *Logik*, § 152. — ED.

[2] Esser, *Logik*, § 152. — ED.

Thus when we judge that as two is to four, so is eight to sixteen, we judge that they are analogically identical; that is, though the sums in other respects are different, they agree in this, that as two is the half of four, so eight is the half of sixteen.

In common language, however, this propriety of the term is not preserved. For *by analogy* is not always meant merely *by proportion*, but frequently *by comparison — by relation*, or simply *by similarity*. In so far as Analogy constitutes a particular kind of reasoning from the individual or particular to the universal, it signifies an inference from the partial similarity of two or more things to their complete or total similarity. For example, — *This disease corresponds in many symptoms with those we have observed in typhus fevers; it will, therefore, correspond in all, that is, it is a typhus fever.*[1]

Has two essential conditions, — First.

Like Induction, Analogy has two essential requisites. In the first place, it is necessary that of two or more things a certain number of attributes should have been observed, in order to ground the inference that they also agree in those other attributes, which it has not yet been ascertained that they possess. It is evident that in proportion to the number of points observed, in which the things compared together coïncide, in the same proportion can it be with safety assumed, that there exists a common principle in these things, on which depends the similarity in the points known as in the points unknown.

Second.

In the second place, it is required that the predicates already observed should neither be all negative nor all contingent; but that some at least should be positive and necessary. Mere negative characters denote only what the thing is not; and contingent characters need not be present in the thing at all. In regard to negative attributes, the inference, that two things, to which a number of qualities do not belong, and which are, consequently, similar to each other only in a negative point of view, — that these things are, therefore, absolutely and positively similar, is highly improbable. But that the judgment in reference to the compared things (say A and X) must be of the same quality (*i. e.* either both affirmative or both negative), is self-evident. For if it be said A *is* B, X *is not* B, A *is not* C, X *is* C; their harmony or similarity is subverted, and we should rather be warranted in arguing their discord and dissimilarity in other points.

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[1] Cf. Krug, *Logik*, § 168 Anm. — Ed. [Condillac, *L'Art de Raisonner*, L. iv. ch. 3, p. 159. Avicenna (in Schmölders, *Documenta Phil. Arabum*, p. 33.) Whately, *Rhetoric*, p. 74.]

And here it is to be noticed that Analogy differs from Induction in this, that it is not limited to one quality, but that it admits of a mixture of both.

In regard to contingent attributes, it is equally manifest that the analogy cannot proceed exclusively upon them. For, if two things coincide in certain accidental attributes (for example, two men in respect of stature, age, and dress), the supposition that there is a common principle, and a general similarity founded thereon, is very unlikely.

Summary of the doctrine of Analogy.

To conclude: Analogy is certain in proportion, 1°, To the number of congruent observations; 2°, To the number of congruent characters observed; 3°, To the importance of these characters and their essentiality to the objects; and, 4°, To the certainty that the characters really belong to the objects, and that a partial correspondence exists.[1] Like Induction, Analogy can only pretend at best to a high degree of probability; it may have a high degree of certainty, but it never reaches to necessity.

Induction and Analogy compared together.

Comparing these two processes together: — "The Analogical is distinguished from the Inductive in this — that Induction regards a single predicate in many subjects as the attribute Z in A, in B, in C, in D, in E, in F, etc.; and as these many belong to one class, say Q; it is inferred that Z will, likewise, be met with in the other things belonging to this class, that is, in all Qs. On the other hand, Analogy regards many attributes in one subject (say *m*, *n*, *o*, *p*, in A); and as these many are in part found in another subject (say *m*, and *n*, in B), it is concluded that, in that second thing, there will also be found the other attributes (say *o* and *p*). Through Induction we, therefore, endeavor to prove that one character belongs (or does not belong) to all the things of a certain class, because it belongs (or does not belong) to many things of that class. Through Analogy, on the other hand, we seek to prove that all the characters of a thing belong (or do not belong) to another or several others, because many of these characters belong to this other or these others. In the one it is proclaimed, — *One in many, therefore one in all.* — In the other it is proclaimed, — *Many in one, therefore all in one.*"[2]

"By these processes of Induction and Analogy, as observed, we are unable to attain absolute certainty; — a great probability is all

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[1] Esser, *Logik*, § 152 Cf Krug, *Logik*, § 168. Anm. — ED.

[2] Krug, *Logik*, § 168. Anm. — ED.

Induction and Analogy do not afford absolute certainty.

that we can reach, and this for the simple reason, that it is impossible, under any condition, to infer the unobserved from the observed, — the whole from any proportion of the parts, — in the way of any rational necessity. Even from the requisites of Induction and Analogy, it is manifest that they bear the stamp of uncertainty; inasmuch as they are unable to determine how many objects or how many characters must be observed, in order to draw the conclusion that the case is the same with all the other objects, or with all the other characters. It is possible only in one way to raise Induction and Analogy from mere probability to complete certainty, — viz., to demonstrate that the principles which lie at the root of these processes, and which we have already stated, are either necessary laws of thought, or necessary laws of nature. To demonstrate that they are necessary laws of thought is impossible; for Logic not only does not allow inference from many to all, but expressly rejects it. Again, to demonstrate that they are necessary laws of nature is equally impossible. This has indeed been attempted, from the uniformity of nature, but in vain. For it is incompetent to evince the necessity of the inference of Induction and Analogy from the fact denominated *the law of nature;* seeing that this law itself can only be discovered by the way of Induction and Analogy. In this attempted demonstration there is thus the most glaring *petitio principii.* The result which has been previously given remains, therefore, intact: — Induction and Analogy guarantee no perfect certainty, but only a high degree of probability, while all probability rests at best upon Induction and Analogy, and nothing else."[1]

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[1] Esser, *Logik*, § 152. — Ed. [On history and doctrine of the Logic of Probabilities, see Leibnitz, *Nouveaux Essais*, L. iv. ch. xv. p. 425, ed. Raspe. Wolf, *Phil. Rat.* § 564 *et seq.* Platner, *Phil. Aphorismen*, § 701 (old edit.) § 591 (new edit.). Zedler, *Lexikon*, *v. Wahrscheinlich.* Walch, *Lexikon*, *Ibid.* Lambert, *Neues Organon*, ii. p. 318 *et seq.* Reusch, *Systema Logicum*, § 653 *et seq.* Hollmann, *Logica*, § 215 *et seq.* Hoffbauer, *Anfangsgründe der Logik*, § 422 *et seq.* Bolzano, *Logik*, vol. ii. § 161, vol. iii. § 317. Bachmann, *Logik*, § 229 *et seq.* Fries, *Logik*, § 96 *et seq.* Prevost, *Essais de Philosophie*, ii. L. i part iii. p. 56. Kant, *Logik*, Einleitung x. Jacob, *Grundriss der Allgemeinen Logik*, § 358, p. 131 *et seq.*, 1800, Halle. Metz, *Institutiones Logicæ*, § 230 *et seq.*, p. 171, 1796.]

# LECTURE XXXIII.

## MODIFIED METHODOLOGY.

### SECTION I.—OF THE ACQUISITION OF KNOWLEDGE

### I. EXPERIENCE.—B. FOREIGN:—ORAL TESTIMONY—ITS CREDIBILITY.

Foreign Experience.

Having, in our last Lecture, terminated the Doctrine of Empirical Knowledge, considered as obtained Immediately,—that is, through the exercise of our own powers of Observation,—we are now to enter on the doctrine of Empirical Knowledge considered as obtained Mediately,—that is, through the Experience of Other Men. The following paragraph will afford you a general notion of the nature and kinds of this knowledge.

Par. CIX. Testimony.

¶ CIX. A matter of Observation or Empirical Knowledge can only be obtained Mediately, that is, by one individual from another, through an enouncement declaring it to be true. This enouncement is called, in the most extensive sense of the word, a *Witnessing* or *Testimony* (*testimonium*); and the person by whom it is made is, in the same sense, called a *Witness*, or *Testifier* (*testis*). The object of the testimony is called the *Fact* (*factum*); and its validity constitutes what is styled *Historical Credibility* (*credibilitas historica*). To estimate this credibility, it is requisite to consider—1°, The Subjective Trustworthiness of the Witnesses (*fides testium*), and 2°, The Objective Probability of the Fact itself. The former is founded partly on the Sincerity, and partly on the Competence, of the Witness. The latter depends on the Absolute and Relative Possibility of the Fact itself. Testimony is either Immediate or Mediate. Immediate, where the fact reported is the object of a Personal Experience; Mediate, where the fact reported is the object of a Foreign Experience.[1]

Explication.

"It is manifest that Foreign Experience, or the experience of other men, is astricted to the same laws, and its certainty measured by the same criteria, as the experience we carry through ourselves. But the experience of the individual is limited, when compared with the experience of the species; and if men did not possess the means of communicating to each other the results of their several observations, — were they unable to coöperate in accumulating a stock of knowledge, and in carrying on the progress of discovery, — they would never have risen above the very lowest steps in the acquisition of science. But to this mutual communication they are competent; and each individual is thus able to appropriate to his own benefit the experience of his fellow-men, and to confer on them in return the advantages which his own observations may supply. But it is evident that this reciprocal communication of their respective experiences among men, can only be effected inasmuch as one is able to inform another of what he has himself observed, and that the vehicle of this information can only be some enouncement in conventional signs of one character or another. The enouncement of what has been observed is, as stated in the paragraph, called *a witnessing*, — *a bearing witness*, — *a testimony*, etc., these terms being employed in their wider acceptation; and he by whom this declaration is made, and on whose veracity it rests, is called a *witness*, *voucher*, or *testifier* (*testis*)."[2] The term *testimony*, I may notice, is sometimes, by an abusive metonym, employed for *witness;* and the word *evidence* is often ambiguously used for *testimony*, and for the bearer of testimony, — *the witness.*

The proper object of Testimony.

"Such an enouncement, — such a testimony, is, however, necessary for others, only when the experience which it communicates is beyond the compass of their own observation. Hence it follows, that matters of reasoning are not proper objects of testimony, since matters of reasoning, as such, neither can rest, nor ought to rest, on the observations of others; for a proof of their certainty is equally competent to all, and may by all be obtained in the manner in which it was originally obtained by those who may bear witness to their truth. And hence it further follows, that matters of experience alone are proper objects of testimony; and of matters of experience themselves, such only as are beyond the sphere of our personal experience. Testimony, in the strictest sense of the term, therefore, is the communication of an experience, or, what amounts to the same thing, the report of an observed phaenomenon, made to those whose own experience or observation has not reached so far.

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[1] Krug, *Logik*, § 172. — Ed. [Cf. Scheibler, *Topica*, c. 31.]

[2] Esser, *Logik*, § 153. — Ed.

The Fact. Historical credibility.

"The object of testimony, as stated in the paragraph, is called the *fact;* the validity of a testimony is called *historical credibility.* The testimony is either immediate or mediate. Immediate, when the witness has himself observed the fact to which he testifies; mediate, when the witness has not himself had experience of this fact, but has received it on the testimony of others. The former, the immediate witness, is commonly styled an *eye-witness* (*testis oculatus*); and the latter, the mediate witness, an *ear-witness* (*testis auritas*). The superiority of immediate to mediate testimony is expressed by Plautus, 'Pluris est oculatus testis unus, quam auriti decem.'[1] These denominations, *eye* and *ear witness*, are however, as synonyms of *immediate* and *mediate witness*, not always either applicable or correct. The person on whose testimony a fact is mediately reported, is called the *guarantee*, or he on whose authority it rests; and the guarantee himself may be again either an immediate or a mediate witness. In the latter case he is called a *second-hand* or *intermediate witness;* and his testimony is commonly styled *hearsay evidence.* Further, Testimony, whether immediate or mediate, is either *partial* or *complete;* either *consistent* or *contradictory.* These distinctions require no comment. Finally, testimony is either *direct* or *indirect;* direct, when the witness has no motive but that of making known the fact; indirect, when he is actuated to this by other ends."[2]

Eye-witness. Ear-witness.

The Guarantee.

Testimonies — Partial, Complete, Consistent, Contradictory.

Division of the subject: I Credibility of Testimony in general. II Credibility of Testimony in its particular forms of Immediate and Mediate.

The only question in reference to Testimony is that which regards its Credibility; and the question concerning the credibility of the witness may be comprehended under that touching the Credibility of Testimony. The order I shall follow in the subsequent observations is this, — I shall, in the first place, consider the Credibility of Testimony in general; and, in the second, consider the Credibility of Testimony in its particular forms of Immediate and Mediate.

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[1] *Truculentus*, II. vi. 8. Cf. Krug, *Logik*, § 172. Anm. — ED.

[2] Esser, *Logik*, § 153. — ED.

First, then, in regard to the Credibility of Testimony in general; — When we inquire whether a certain testimony is, or is not, deserving of credit, there are two things to be considered: 1°, The Object of the Testimony, that is, the fact or facts for the truth of which the Testimony vouches; and, 2°, The Subject of the Testimony, that is, the person or persons by whom the testimony is borne. The question, therefore, concerning the Credibility of Testimony, thus naturally subdivides itself into two. Of these questions, the first asks, — What are the conditions of the credibility of a testimony by reference to what is testified, that is, in relation to the Object of the testimony? The second asks, — What are the conditions of the credibility of a testimony by reference to him who testifies, that is, in relation to the Subject of the testimony?[1] Of these in their order.

I. Credibility of Testimony in general. 1°, The Object of the Testimony.

Its Absolute Possibility.

On the first question. — "In regard to the matter testified, that is, in regard to the object of the testimony; it is, first of all, a requisite condition, that what is reported to be true should be possible, both absolutely, or as an object of the Elaborative Faculty, and relatively, or as an object of the Presentative Faculties, — Perception, External or Internal. A thing is possible absolutely, or in itself, when it can be construed to thought, that is, when it is not inconsistent with the logical laws of thinking; a thing is relatively possible as an object of Perception, External or Internal, when it can affect Sense or Self-consciousness, and, through such affection, determine its apprehension by one or other of these faculties. A testimony is, therefore, to be unconditionally rejected, if the fact which it reports be either in itself impossible, or impossible as an object of the Presentative Faculties. But the impossibility of a thing, as an object of these faculties, must be decided either upon physical, or upon metaphysical, principles. A thing is physically impossible as an object of sense, when the existence itself, or its perception by us, is, by the laws of the material world, impossible. It is metaphysically impossible, when the object itself, or its perception, is possible neither through a natural, nor through a supernatural, agency. But, to establish the metaphysical impossibility of a thing, it is not sufficient that its existence cannot be explained by the ordinary laws of nature, or even that its existence should appear repugnant with these laws; it is requisite that an universal and immutable law of nature should have been demonstrated to

Physical and Metaphysical Impossibility.

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[1] Cf. Esser, *Logik*, § 154. — Ed.

exist, and that this law would be subverted if the fact in question were admitted to be physically possible. In like manner, to constitute the metaphysical impossibility of a thing, it is by no means enough to show that it is not explicable on natural laws, or even that any natural law stands opposed to it; it is further requisite to prove that the intervention even of supernatural agency is incompetent to its production, that its existence would involve the violation of some necessary principle of reason.

Relative Possibility of an object.

"To establish the credibility of a testimony, in so far as this is regulated by the nature of its object, there is, besides the proof of the absolute possibility of this object, required also a proof of its relative possibility; that is, there must not only be no contradiction between its necessary attributes, — the attributes by which it must be thought, — but no contradiction between the attributes actually assigned to it by the testimony. A testimony, therefore, which, *qua* testimony, is self-contradictory, can lay no claim to credibility; for what is self-contradictory is logically suicidal. And here the only question is, — Does the testimony, *qua* testimony, contradict itself? for if the repugnancy arise from an opinion of the witness, apart from which the testimony as such would still stand undisproved, in that case the testimony is not at once to be repudiated as false. For example, it would be wrong to reject a testimony to the existence of a thing, because the witness had to his evidence of its observed reality annexed some conjecture in regard to its origin or cause. For the latter might well be shown to be absurd, and yet the former would remain unshaken. It is, therefore, always to be observed, — that it is only the self-contradiction of a testimony, *qua* testimony, that is, the self-contradiction of the fact itself, which is peremptorily and irrevocably subversive of its credibility.

2°, The Subject of the Testimony, or personal trustworthiness of the Witness. This consists of two elements: — (a) Honesty or Veracity.

"We now proceed to the second question; that is, to consider in general the Credibility of a Testimony by reference to its Subject, that is, in relation to the Personal Trustworthiness of the Witness. The trustworthiness of a witness consists of two elements or conditions. In the first place, he must be willing, in the second place, he must be able, to report the truth. The first of these elements is the Honesty, — the Sincerity, — the Veracity; the second is the Competency of the Witness. Both are equally necessary, and if one or other be deficient, the testimony becomes altogether null. These constituents, likewise, do not infer each other; for it frequently happens that where the honesty is greatest the competency is least, and where the competency is greatest the honesty is least. But when the veracity of a witness is established, there is established also a presumption of his competency; for an honest man will not bear evidence to a point in regard to which his recollection is not precise, or to the observation of which he had not accorded the requisite attention. In truth, when a fact depends on the testimony of a single witness, the competency of that witness is solely guaranteed by his honesty. In regard to the honesty of a witness, — this, though often admitting of the highest probability, never admits of absolute certainty; for, though, in many cases, we may know enough of the general character of the witness to rely with perfect confidence on his veracity, in no case can we look into the heart, and observe the influence which motives have actually had upon his volitions. We are, however, compelled, in many of the most important concerns of our existence, to depend on the testimony, and, consequently, to confide in the sincerity, of others. But from the moral constitution of human nature, we are warranted in presuming on the honesty of a witness; and this presumption is enhanced in proportion as the following circumstances concur in its confirmation. In the first place, a witness is to be presumed veracious in this case, in proportion as his love of truth is already established from others. In the second place, a witness is to be presumed veracious, in proportion as he has fewer and weaker motives to falsify his testimony. In the third place, a witness is to be presumed veracious, in proportion to the likelihood of contradiction which his testimony would encounter, if he deviated from the truth. So much for the Sincerity, Honesty, or Veracity of a witness.

The presumption of the Honesty of a Witness enhanced by certain circumstances.

(b) Competency of a Witness.

“ In regard to the Competency or Ability of a witness, — this, in general, depends on the supposition, that he has had it in his power correctly to observe the fact to which he testifies, and correctly to report it. The presumption in favor of the competence of a witness rises in proportion as the following conditions are fulfilled: — In the first place, he must be presumed competent in reference to the case in hand, in proportion as his general ability to observe and to communicate his observation has been established in other cases. In the second place, the competency of a witness must be presumed, in proportion as in the particular case a lower and commoner amount of ability is

Circumstances by which the presumption of competency is enhanced.

requisite rightly to observe, and rightly to report the observation. In the third place, the competency of a witness is to be presumed, in proportion as it is not to be presumed that his observation was made or communicated at a time when he was unable correctly to make or correctly to communicate it. So much for the Competency of a witness.

The credibility of Testimony not invalidated because the fact testified is one out of the ordinary course of experience.

"Now, when both the good will and the ability, that is, when both the Veracity and Competence of a witness have been sufficiently established, the credibility of his testimony is not to be invalidated because the fact which it goes to prove is one out of the ordinary course of experience."[1] Thus it would be false to assert, with Hume, that miracles, that is, suspensions of the ordinary laws of nature, are incapable of proof, because contradicted by what we have been able to observe. "On the contrary, where the trustworthiness of a witness or witnesses is unimpeachable, the very circumstance that the object is one in itself unusual and marvellous, adds greater weight to the testimony; for this very circumstance would itself induce men of veracity and intelligence to accord a more attentive scrutiny to the fact, and secure from them a more accurate report of their observation.

Summary regarding the Credibility of Testimony in general.

"The result of what has now been stated in regard to the credibility of Testimony in general, is:— That a testimony is entitled to credit when the requisite conditions, both on the part of the object and on the part of the subject, have been fulfilled. On the part of the object these are fulfilled when the object is absolutely possible, as an object of the higher faculty of experience, — the Understanding, — the Elaborative Faculty, and relatively possible, as an object of the lower or subsidiary faculties of experience, — Sense, and Self-consciousness. In this case, the testimony, *qua* testimony, does not contradict itself. On the part of the subject the requisite conditions are fulfilled when the trustworthiness, that is, the veracity and competency of the witness, is beyond reasonable doubt. In regard to the veracity of the witness, — this cannot be reasonably doubted, when there is no positive ground on which to discredit the sincerity of the witness, and when the only ground of doubt lies in the mere general possibility of deception. And in reference to the competency of a witness, — this is exposed to no reasonable objection, when the ability of the witness to observe and to communicate the fact in testimony cannot be disallowed. Having, therefore, concluded the consideration of testimony in general, we proceed to treat of it in special, that is, in so far as it is viewed either as Immediate or as Mediate."[1] Of these in their order.

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[1] Esser, *Logik*, § 154. — Ed.

II. Testimony in special, as Immediate and Mediate.

1°. Immediate Testimony.

The special consideration of Testimony, when that testimony is Immediate. — "An immediate testimony, or testimony at first hand, is one in which the fact reported is an object of the proper or personal experience of the reporter. Now it is manifest, that an immediate witness is in general better entitled to credit than a witness at second hand; and his testimony rises in probability, in proportion as the requisites, already specified, both on the part of its object and on the part of its subject, are fulfilled. An immediate testimony is, therefore, entitled to credit, — 1°, In proportion to the greater ability with which the observation has been made; 2°, In proportion to the less impediment in the way of the observation being perfectly accomplished; 3°, In proportion as what was observed could be fully and accurately remembered; and, 4°, In proportion as the facts observed and remembered have been communicated by intelligible and unambiguous signs.

Conditions of its Credibility.

Whether all these conditions are fulfilled in the case of any immediate testimony, cannot be directly ascertained.

"Now, whether all these conditions of a higher credibility be fulfilled in the case of any immediate testimony, — this cannot be directly and at once ascertained; it can only be inferred, with greater or less certainty, from the qualities of the witness; and, consequently, the validity of a testimony can only be accurately estimated from a critical knowledge of the personal character of the witness, as given in his intellectual and moral qualities, and in the circumstances of his life, which have concurred to modify and determine these. The veracity of a witness either is, or is not, exempt from doubt; and, in the latter case, it may not only lie open to doubt, but even be exposed to suspicion. If the sincerity of the witness be indubitable, a direct testimony is always preferable to an indirect; for a direct testimony being made with the sole intent of establishing the certainty of the fact in question, the competency of the witness is less exposed to objection. If, on the contrary, the sincerity of the witness be not beyond a doubt, and, still more, if it be actually suspected, in that case an indirect testimony is of higher cogency than a direct; for the indirect testimony being given with another view than merely to establish the fact in question, the intention of the witness to falsify the truth of the fact has not so strong a presumption in its favor. If both the sincerity and the competency of the witness are altogether indubitable, it is then of no importance whether the truth of the fact be vouched for by a single witness, or by a plurality of witnesses. On the other hand, if the sincerity and competency of the witness be at all doubtful, the credibility of a testimony will be greater, the greater the number of the witnesses by whom the fact is corroborated. But here it is to be considered, that when there are a plurality of testimonies to the same fact, these testimonies are either consistent or inconsistent. If the testimonies be consistent, and the sincerity and competency of all the witnesses complete, in that case the testimony attains the highest degree of probability of which any testimony is capable. Again, if the witnesses be inconsistent, — on this hypothesis two cases are possible; for either their discrepancy is negative, or it is positive. A negative discrepancy arises, where one witness passes over in silence what another witness positively avers. A positive discrepancy arises, where one witness explicitly affirms something, which something another witness explicitly denies. When the difference of testimonies is merely negative, we may suppose various causes of the silence; and, therefore, the positive averment of one witness to a fact is not disproved by the mere circumstance that the same fact is omitted by another. But if it be made out, that the witness who omits mention of the fact could not have been ignorant of that fact had it taken place, and, at the same time, that he could not have passed it over without violating every probability of human action, — in this case, the silence of the one witness manifestly derogates from the credibility of the other witness, and in certain circumstances may annihilate it altogether. Where, again, the difference is positive, the discrepancy is of greater importance, because (though there are certainly exceptions to the rule) an overt contradiction is, in general and in itself, of stronger cogency than a mere non-confirmation by simple silence. Now the positive discrepancy of testimonies either admits of conciliation, or it does not. In the former case, the credibility of the several testimonies stands intact; and the discrepancy among the witnesses is to be accounted for by such circumstances as explain, without invalidating, the testimony considered in itself. In the latter case, one testimony manifestly detracts from the credibility of another; for of incompatible testimonies, while both can-

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[1] Esser, *Logik*, § 154. — ED.

When testimony attains the highest degree of probability.

Negative and Positive Discrepancy.

not be true, the one must be false, when reciprocally contradictory, or they may both be false, when reciprocally contrary. In this case, the whole question resolves itself into one of the greater or less trustworthiness of the opposing witnesses. Is the trustworthiness of the counter-witnesses equally great? In that case, neither of the conflictive testimonies is to be admitted. Again, is the trustworthiness of the witnesses not upon a par? In that case, the testimony of the witness whose trustworthiness is the greater, obtains the preference, — and this more especially if the credibility of the other witnesses is suspected."[1]

So much for the Credibility of Testimony, considered in Special, in so far as that testimony is Immediate or at First Hand; and I now, in the second place, pass on to consider, likewise in special, the Credibility of Testimony, in so far as that testimony is Mediate, or at Second Hand.

2°, Mediate Testimony.

"A Mediate Testimony is one where the fact is an object not of Personal, but of Foreign Experience. Touching the credibility of a mediate testimony, this supposes that the report of the immediate, and that the report of the mediate, witness are both trustworthy. Whether the report of the immediate witness be trustworthy, — this we are either of ourselves able to determine, viz., from our personal acquaintance with his veracity and competence; or we are unable of ourselves to do this, in which case the credibility of the immediate must be taken upon the authority of the mediate witness. Here, however, it is necessary for us to be aware, that the mediate witness is possessed of the ability requisite to estimate the credibility of the immediate witness, and of the honesty to communicate the truth without retrenchment or falsification. But if the trustworthiness both of the mediate and of the immediate witness be sufficiently established, it is of no consequence, in regard to the credibility of a testimony, whether it be at first hand or at second. Nay, the testimony of a mediate may even tend to confirm the testimony of an immediate witness, when his own competence fairly to appreciate the report of the immediate witness is indubitable. If, however, the credibility of the immediate witness be unimpeachable, but not so the credibility of the mediate, in that case the mediate testimony, in respect of its authority, is inferior to the immediate, and this in the same proportion as the credibility of the second hand witness is inferior to that of the witness at first hand. Further, mediate witnesses are either Proximate or Remote; and, in both cases, either Independent or Dependent. The trustworthiness of proximate witnesses is, in general, greater than the trustworthiness of remote; and the credibility of independent witnesses greater than the credibility of dependent. The remote witness is unworthy of belief, when the intermediate links are wanting between him and the original witness; and the dependent witness deserves no credit, when that on which his evidence depends is recognized as false or unestablished. Mediate testimonies are, likewise, either direct or indirect; and, likewise, when more than one, either reciprocally congruent or conflictive. In both cases the credibility of the witnesses is to be determined in the same manner as if the testimonies were immediate.

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[1] Esser, *Logik*, § 155. — Ed.

Mediate Witnesses are either Proximate or Remote, and either Independent or Dependent.

"The testimony of a plurality of mediate witnesses, where there is no recognized immediate witness, is called a *rumor*, if the witnesses be contemporaneous; and a *tradition*, if the witnesses be chronologically successive. These are both less entitled to credit, in proportion as in either case a fiction or falsification of the fact is comparatively easy, and, consequently, comparatively probable."[1]

Rumor, — what. Tradition.

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[1] Esser, *Logik*, § 156. — Ed.

# LECTURE XXXIV.

## MODIFIED METHODOLOGY.

## SECTION I.—OF THE ACQUISITION OF KNOWLEDGE.

### I. EXPERIENCE.—B. FOREIGN:—RECORDED TESTIMONY AND WRITINGS IN GENERAL.

### II. SPECULATION.

Criticism of Recorded Testimony, and of Writings in general

IN our last Lecture, we were engaged in the consideration of Testimony, and the Principles by which its Credibility is governed,—on the supposition always that we possess the veritable report of the witness whose testimony it professes to be, and on the supposition that we are at no loss to understand its meaning and purport. But questions may arise in regard to these points, and, therefore, there is a further critical process requisite, in order to establish the Authenticity,—the Integrity, and the Signification, of the documents in which the testimony is conveyed. This leads to the important subject,—the Criticism of Recorded Testimony, and of Writings in general. I shall comprise the heads of the following observations on this subject in the ensuing paragraph.

Par. CX. Criticism and Interpretation.

¶ CX. The examination and judgment of Writings professing to contain the testimony of certain witnesses, and of Writings in General professing to be the work of certain authors, is of two parts. For the inquiry regards either, 1°, The Authenticity of the document, that is, whether it be, in whole or in part, the product of its ostensible author; for ancient writings in particular are frequently supposititious or interpolated; or, 2°, It regards the Meaning of the words of which it is composed, for these, especially when in languages now dead, are frequently obscure. The former of these problems is resolved by the *Art of Criticism* (*Critica*), in the stricter sense of the term; the latter by the *Art of Interpretation* (*Exegetica* or *Hermeneutica*). Criticism is of two kinds. If it be occupied with the criteria of the authenticity of a writing in its totality, or in its principal parts, it is called the *Higher*, and sometimes the *Internal*, *Criticism*. If, again, it consider only the integrity of particular words and phrases, it is called the *Lower*, and sometimes the *External*, *Criticism*. The former of these may perhaps be best styled the *Criticism of Authenticity*; — the latter, the *Criticism of Integrity*.

The problem which Interpretation has to solve is, — To discover and expound the meaning of a writer, from the words in which his thoughts are expressed. It departs from the principle, that however manifold be the possible meanings of the expressions, the sense of the writer is one. Interpretation, by reference to its sources or subsidia, has been divided into the *Grammatical*, the *Historical*, and the *Philosophical*, *Exegesis*.[1]

Explication

"Testimonies, especially when the ostensible witnesses themselves can no longer be interrogated, may be subjected to an examination under various forms; and this examination is in fact indispensable, seeing not only that a false testimony may be substituted for a true, and a testimony true upon the whole may yet be falsified in its parts, — a practice which prevailed to a great extent in ancient times; while at the same time the meaning of the testimony, by reason either of the foreign character of the language in which it is expressed, or of the foreign character of thought in which it is conceived, may be obscure and undetermined. The examination of a testimony is twofold, inasmuch as it is either an examination of its Authenticity and Integrity, or an examination of its Meaning. This twofold process of examination is applicable to testimonies of every kind, but it becomes indispensable when the testimony has been recorded in writing, and when this, from its antiquity, has come down to us only in transcripts, indefinitely removed from the original, and when the witnesses are men differing greatly from ourselves in language, manners, customs, and associations of

The examination of a testimony twofold, — of its Authenticity and Integrity, and of its Meaning.

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[1] Cf. Krug, *Logik*, § 177 *et seq.* — Ed. [Snell, *Logik*, p. ii. § 6 p. 195. Kiesewetter, *Logik*, p. ii. § 185 *et seq.*]

Criticism.

Interpretation.

thought. The solution of the problem, — By what laws are the authenticity or spuriousness, the integrity or corruption, of a writing to be determined, — constitutes the Art of Criticism, in its stricter signification (*Critica*); and the solution of the problem, — By what law is the sense or meaning of writing to be determined, — constitutes the Art of Interpretation or Exposition (*Hermeneutica, Exegetica*). In theory, Criticism ought to precede Interpretation, for the question, — Who has spoken, naturally arises before the question, — How what has been spoken is to be understood. But in practice, criticism and interpretation cannot be separated; for in application they proceed hand in hand."[1]

I. Criticism.

Its problems.

Universal Criticism.

Special Criticism. Universal Criticism alone within the sphere of Logic.

Its Divisions.

"First, then, of Criticism; and the question that presents itself in the threshold is, — What are its Definition and Divisions? Under Criticism is to be understood the complement of logical rules, by which the authenticity or spuriousness, the integrity or interpolation, of a writing is to be judged. The problems which it proposes to answer are — 1°, Does a writing really proceed from the author to whom it is ascribed; and, 2°, Is a writing, as we possess it, in all its parts the same as it came from the hands of its author. The system of fundamental rules, which are supposed in judging of the authenticity and integrity of every writing, constitutes what is called the *Doctrine of Universal Criticism;* and the system of particular rules, by which the authenticity and integrity of writings of a certain kind are judged, constitutes the doctrine of what is called *Special Criticism.* It is manifest, from the nature of Logic, that the doctrine of Universal Criticism is alone within its sphere. Now Universal Criticism is conversant either with the authenticity or spuriousness of a writing considered as a whole, or with the integrity or interpolation of certain parts. In the former case it is called *Higher*, in the latter, *Lower, Criticism;* but these denominations are inappropriate. The one criticism has also been styled the *Internal*, the other the *External;* but these appellations are, likewise, exceptionable; and, perhaps, it would be preferable to call the former the *Criticism of the Authenticity*, the latter, the *Criticism of the Integrity*, of a work. I shall consider these in particular; and, first, of the Criticism of Authenticity.

"A proof of the authenticity of a writing, more especially of an ancient writing, can be rested only upon two grounds, — an Internal and an External, — and on these either apart or in combination. By *internal grounds*, we mean those indications of authenticity which the writing itself affords. By *external grounds*, we denote the testimony borne by other works, of a corresponding antiquity, to the authenticity of the writing in question.

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[1] Esser, *Logik*, § 157. — Ed.

1. Criticism of Authenticity.

"In regard to the Internal Grounds; — it is evident, without entering upon details, that these cannot of themselves, that is, apart from the external grounds, afford evidence capable of establishing beyond a doubt the authenticity of an ancient writing; for we can easily conceive that an able and learned forger may accommodate his fabrications both to all the general circumstances of time, place, people, and language, under which it is supposed to have been written, and even to all the particular circumstances of the style, habit of thought, personal relations, etc., of the author by whom it professes to have been written, so that everything may militate for, and nothing militate against, its authenticity.

(a) Internal Grounds. These of themselves not sufficient to establish the authenticity of a writing.

"But if our criticism from the internal grounds alone be, on the one hand, impotent to establish, it is, on the other, omnipotent to disprove. For it is sufficient to show that a writing is in essential parts, that is, parts which cannot be separated from the whole, in opposition to the known manners, institutions, usages, etc., of that people with which it would, and must, have been in harmony, were it the product of the writer whose name it bears; that, on the contrary, it bears upon its face indications of another country or of a later age; and, finally, that it is at variance with the personal circumstances, the turn of mind, and the pitch of intellect, of its pretended author. And here it is to be noticed, that these grounds are only relatively internal; for we become aware of them originally only through the testimony of others, that is, through external grounds."[1]

But omnipotent to disprove this.

In regard to the External Grounds; — they, as I said, consist in the testimony, direct or indirect, given to the authenticity of the writing in question by other works of a competent antiquity. This testimony may be contained either in other and admitted writings of the supposed author himself; or in those of contemporary writers; or in those of writers approximating in antiquity. This testimony may also be

(b) External Grounds.

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[1] Esser, *Logik*, § 158—160. — Ed.

given either directly, by attribution of the disputed writing by title to the author; or indirectly, by quoting as his certain passages which are to be found in it. On this subject it is needless to go into detail. and it is hardly necessary to observe, that the proof of the authenticity is most complete when it proceeds upon the internal and external grounds together. I, therefore, pass on to the Criticism of Integrity.[1]

2. Criticism of Integrity.

"When the authenticity of an ancient work has been established on external grounds, and been confirmed on internal, the integrity of this writing is not therewith proved; for it is very possible, and in ancient writings indeed very probable, that particular passages are either interpolated or corrupted. The authenticity of particular passages is to be judged of precisely by the same laws which regulate our criticism of the authenticity of the whole work. The proof most pertinent to the authenticity of particular passages is drawn — 1°, From their acknowledgment by the author himself in other, and these unsuspected, works; 2°, From the attribution of them to the author by other writers of competent information; and, 3°, From the evidence of the most ancient MSS. On the other hand, a passage is to be obelized as spurious, — 1°, When found to be repugnant to the general relations of time and place, and to the personal relations of the author; 2°, When wanting in the more ancient codices, and extant only in the more modern. A passage is suspicious, when any motive for its interpolation is manifest, even should we be unable to establish it as spurious. The differences which different copies of a writing exhibit in the particular passages, are called *various readings* (*variæ lectiones* or *lectiones variantes*). Now, as of various readings only one can be the true, while they may all very easily be false, the problem which the criticism of Integrity proposes to solve is, — How is the genuine reading to be made out; and herein consists what is technically called the *Recension*, more properly the *Emendation*, of the text.

Emendation of the text, — of two kinds, viz., Historical and Conjectural.

"The Emendation of an ancient author may be of two kinds; the one of which may be called *Historical*, the other the *Conjectural*. The former of these founds upon historical data for its proof; the latter, again, proceeds on grounds which lie beyond the sphere of historical fact, and this for the very reason that historical fact is found incompetent to the restoration of the text to its original integrity. The historical emendation necessarily precedes the conjectural, because the object itself of emendation is wholly of an historical character, and because it is not permitted to attempt any other than an emendation on historical grounds, until, from these very grounds themselves, it be shown that the restitution of the text to its original integrity cannot be historically accomplished. Historical Emendation is again of two kinds, according as its judgment proceeds on external or on internal grounds. It founds upon external grounds, when the reasons for the truth or falsehood of a reading are derived from testimony; it founds upon internal grounds, when the reasons for the truth or falsehood of a reading are derived from the writing itself. Historical emendation has thus a twofold function to perform (and in its application to practice, these must always be performed in conjunction), viz., it has carefully to seek out and accurately to weigh both the external and internal reasons in support of the reading in dispute. Of external grounds the principal consists in the confirmation afforded by MSS., by printed editions which have immediately emanated from MSS., by ancient translations, and by passages quoted in ancient authors. The internal grounds are all derived either from the form, or from the contents, of the work itself. In reference to the form, — a reading is probable, in proportion as it corresponds to the general character of the language prevalent at the epoch when the work was written, and to the peculiar character of the language by which the author himself was distinguished. In reference to the contents, — a reading is probable, when it harmonizes with the context, that is, when it concurs with the other words of the particular passage in which it stands, in affording a meaning reasonable in itself, and conformable with the author's opinions, reasonings, and general character of thought."[1]

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[1] See Esser, *Logik*, §§ 161, 162. — Ed.

Historical Emendation of two kinds, — External and Internal.

"It frequently happens, however, that, notwithstanding the uniformity of MSS., and other external subsidia, a reading cannot be recognized as genuine. In this case, it must be scientifically shown from the rules of criticism itself that this lection is corrupt. If the demonstration thus attempted be satisfactory, and if all external subsidia have been tried in vain, the critic is permitted to consider in what manner the corrupted passage can be restored to its integrity. And here the conjectural or divinatory emendation comes into play; a process in which the power and effi-

Conjectural Emendation.

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[1] Esser, *Logik*, § 163. — ED.

ciency of criticism and the genius of the critic are principally manifested."[1]

So much for Criticism, in its applications both to the Authenticity and to the Integrity of Writings. We have now to consider the general rules by which Interpretation, that is, the scientific process of expounding the Meaning of an author, is regulated.

II. Interpretation.

General and Special.

"By the *Art of Interpretation*, called likewise technically *Hermeneutic* or *Exegetic*, is meant the complement of logical laws, by which the sense of an ancient writing is to be evolved. Hermeneutic is either General or Special. General, when it contains those laws which apply to the interpretation of any writing whatever; Special, when it comprises those laws by which writings of a particular kind are to be expounded. The former of these alone is of logical concernment. The problem proposed for the Art of Interpretation to solve, is, — How are we to proceed in order to discover from the words of a writing that sole meaning which the author intended them to convey? In the interpretation of a work, it is not, therefore, enough to show in what signification its words may be understood; for it is required that we show in what signification they must. To the execution of this task two conditions are absolutely necessary; 1°, That the interpreter should be thoroughly acquainted with the language itself in general, and with the language of the writer in particular; and, 2°, That the interpreter should be familiar with the subjects of which the writing treats. But these two requisites, though indispensable, are not of themselves sufficient. It is also of importance that the expositor should have a competent acquaintance with the author's personal circumstances and character of thought, and with the history and spirit of the age and country in which he lived. In regard to the interpretation itself, — it is to be again observed, that as a writer could employ expressions only in a single sense, so the result of the exposition ought to be not merely to show what meaning may possibly attach to the doubtful terms, but what meaning necessarily must. When, therefore, it appears that a passage is of doubtful import, the best preparative for a final determination of its meaning is, in the first place, to ascertain in how many different significations it may be construed, and then, by a process of exclusion, to arrive at the one veritable meaning. When, however, the obscurity cannot be removed, in that case it is the duty of the expositor, before abandoning his task, to evince that an interpretation of the passage is, without change, absolutely or relatively impossible.

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[1] Esser, *Logik*, § 166. — Ed. [*Parrhasiana*, i. 359–365, 2d ed. 1701. Genuensis, *Ars Logico-Critica*, L. iv. c. vi. *et seq.*]

Sources of Interpretation.

"As to the sources from whence the Interpretation is to be drawn, — these are three in all, — viz., 1°, The *Tractus literarum*, the words themselves, as they appear in MSS.; 2°, The context, that is, the passage in immediate connection with the doubtful term; 3°, Parallel or analogous passages in the same, or in other writings."[1] How the interpretation drawn from these sources is to be applied, I shall not attempt to detail; but pass on to a more generally useful and interesting subject.

Speculation the Second Means of Knowledge.

So much for Experience or Observation, the first mean of scientific discovery, that, viz., by which we apprehend what is presented as contingent phænomena, and by whose process of Induction and Analogy we carry up individual into general facts. We have now to consider the other mean of scientific discovery, that, viz., by which, from the phænomena presented as contingent, we separate what is really necessary, and thus attain to the knowledge, not of merely generalized facts, but of universal laws. This mean may, for distinction's sake, be called *Speculation*, and its general nature I comprehend in the following paragraph.

Par. CXI. Speculation, — as a means of Knowledge.

¶ CXI. When the mind does not rest contented with observing and classifying the objects of its experience, but, by a reflective analysis, sunders the concrete wholes presented to its cognition, throws out of account all that, as contingent, it can think away from, and concentrates its attention exclusively on those elements which, as necessary conditions of its own acts, it cannot but think; — by this process it obtains the knowledge of a certain order of facts, — facts of Self-consciousness, which, as essential to all Experience, are not the result of any; constituting in truth the Laws by which the possibility of our cognitive functions is determined. This process, by which we thus attain to a discriminative knowledge of the *Necessary*, *Native*, and, as they are also called, the *Noetic*, *Pure*, *a priori*, or *Transcendental*, *Elements of Thought*, may be styled *Speculative Analysis*, *Analytic Speculation*, or *Specu-*

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[1] Esser, *Logik*, § 167. — ED. [Cf. Snell, *Logik*, p. ii. § 6, p. 200.]

*lation* simply, and is carefully to be distinguished from Induction, with which it is not unusually confounded.

Explication.

"The empirical knowledge of which we have hitherto been speaking, does not, however varied and extensive it may be, suffice to satisfy the thinking mind as such; for our empirical knowledge itself points at certain higher cognitions from which it may obtain completion, and which are of a very different character from that by which the mere empirical cognitions themselves are distinguished. The cognitions are styled, among other names, by those of *noetic*, *pure*, or *rational*, and they are such as cannot, though manifested in experience, be derived from experience; for, as the conditions under which experience is possible, they must be viewed as necessary constituents of the nature of the thinking principle itself. Philosophers have indeed been found to deny the reality of such cognitions native to the mind; and to confine the whole sphere of human knowledge to the limits of experience. But in this case philosophers have overlooked the important circumstance, that the acts, that is, the apprehension and judgment, of experience, are themselves impossible, except under the supposition of certain potential cognitions previously existent in the thinking subject, and which become actual on occasion of an object being presented to the external or internal sense. As an example of a noetic cognition, the following propositions may suffice: — An object and all its attributes are convertible; — All that is has its sufficient cause. The principal distinctions of Empirical and Rational Knowledges, or rather Empirical and Noetic Cognitions, are the following: — 1°, Empirical cognitions originate exclusively in experience, whereas noetic cognitions are virtually at least before or above all experience, — all experience being only possible through them. 2°, Empirical cognitions come piecemeal and successively into existence, and may again gradually fade and disappear; whereas noetic cognitions, like Pallas, armed and immortal from the head of Jupiter, spring at once into existence, complete and indestructible. 3°, Empirical cognitions find only an application to those objects from which they were originally abstracted, and, according as things obtain a different form, they also may become differently fashioned; noetic cognitions, on the contrary, bear the character impressed on them of necessity, universality, sameness. Whether a cognition be empirical or noetic, can only be determined by

Principal distinctions of Empirical and Noetic Cognitions.

considering whether it can or cannot be presented in a sensible perception; — whether it do or do not stand forward clear, distinct, and indestructible, bearing the stamp of necessity and absolute universality. The noetic cognitions can be detected only by a critical analysis of the mental phænomena proposed for the purpose of their discovery;"[1] and this analysis may, as I have said, be styled Speculation, for want of a more appropriate appellation.

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[1] Esser, *Logik*, § 171. — Ed.

# LECTURE XXXV.

## MODIFIED METHODOLOGY.

## SECTION I.—OF THE ACQUISITION OF KNOWLEDGE

### III. COMMUNICATION OF KNOWLEDGE.—A. INSTRUCTION —ORAL AND WRITTEN.—B. CONFERENCE— DIALOGUE AND DISPUTATION.

I now go on to the last Mean of Acquiring and Perfecting our knowledge; and commence with the following paragraph:

Par. CXII. The Communication of Thought,—as a means of Acquiring and Perfecting Knowledge.

> ¶ CXII. An important mean for the Acquisition and Perfecting of Knowledge is the Communication of Thought. Considered in general, the Communication of thought is either One-sided, or Mutual. The former is called *Instruction* (*institutio*), the latter, *Conference* (*collocutio*); but these, though in theory distinct, are in practice easily combined. Instruction is again either *Oral* or *Written*: and Conference, as it is interlocutory and familiar, or controversial and solemn, may be divided into *Dialogue* (*colloquium*, *dialogus*), and *Disputation* (*disputatio*, *concertatio*). The Communication of thought in all its forms is a means of intellectual improvement, not only to him who receives, but to him who bestows, information; in both relations, therefore, it ought to be considered, and not, as is usually done, in the former only.[1]

Explication

In illustrating this paragraph, I shall commence with the last sentence, and, before treating in detail of Instruction and Conference, as means of extending the limits of our knowledge by new acquisitions derived from the communication of others, I shall endeavor to show, that the Communication of thought is itself an important mean towards the perfecting of knowledge in the mind of the communicator himself. In this view, the communication of knowledge is like the attribute of mercy, twice blessed, — "blessed to him that gives and to him that takes;" in teaching others we in fact teach ourselves.

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[1] Cf. Krug, *Logik*, § 181 *et seq.*—Ed.

The Communication of Thought an important mean towards the perfecting of Knowledge in the mind of the communicator.

This view of the reflex effect of the communication of thought on the mind, whether under the form of Instruction or of Conference, is one of high importance, but it is one which has, in modern times, unfortunately been almost wholly overlooked. To illustrate it in all its bearings would require a volume; at present I can only contribute a few hints towards its exposition.

Man naturally determined to communication.

This fact noticed by Plato.

Man is, by an original tendency of his nature, determined to communicate to others what occupies his thoughts, and by this communication he obtains a clearer understanding of the subject of his cogitations than he could otherwise have compassed. This fact did not escape the acuteness of Plato. In the *Protagoras*, — "It has been well," says Plato (and he has sundry passages to the point), — "It has been well, I think, observed by Homer —

> 'Through mutual intercourse and mutual aid,
> Great deeds are done and great discoveries made;
> The wise new wisdom on the wise bestow,
> Whilst the lone thinker's thoughts come slight and slow.'[1]

Aristotle.

Themistius.

Lucilius.

For in company we, all of us, are more alert, in deed and word and thought. *And if a man excogitate aught by himself, forthwith he goes about to find some one to whom he may reveal it, and from whom he may obtain encouragement, aye and until his discovery be completed.*"[2] The same doctrine is maintained by Aristotle, and illustrated by the same quotation;[3] (to which, indeed, is to be referred the adage, — "Unus homo, nullus homo.") — "We rejoice," says Themistius, "in hunting truth in company, as in hunting game."[4] Lucilius, — "Scire est nescire, nisi id me scire alius scierit;[5] — paraphrased in the compacter, though far inferior, verse of Persius, — "Scire tuum nihil est, nisi te scire hoc sciat alter."[1] — Cicero's Cato testifies to the same truth: — "Non facile est invenire, qui quod sciat ipse, non tradat alteri."[2] And Seneca: — "Sic cum hac exceptione detur sapientia, ut illam inclusam teneam nec enunciem, rejiciam. Nullius boni, sine socio, jucunda possessio est."[3]

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[1] Altered from Pope's *Homer*, Book x. 265.

[2] *Protag.*, p. 348. Compare *Lectures on Metaphysics*, p. 261.

[3] *Eth. Nic.*, viii. 1.

[4] *Orat.* xxi. *Explorator aut Philosophus*, *Orationes*, p. 254, ed. Harduin, Paris, 1684. — Ed.

[5] *Fragm.*, 25, in the Bipont edition of Persius and Juvenal, p. 176. — Ed.

Persius.

Cicero.

Seneca.

"Condita tabescit, vulgata scientia crescit."[4]

"In hoc gaudeo aliquid discere, ut doceam: nec me ulla res delectabit, licet eximia sit et salutaris, quam mihi uni, sciturus sim."[5] "Ita non solum ad discendum propensi sumus, verum etiam ad docendum."[6]

Modes in which Communication is conducive to the Perfecting of Thought are two.

The modes in which the Communication of thought is conducive to the perfecting of thought itself, are two; for the mind may be determined to more exalted energy by the sympathy of society, and by the stimulus of opposition; or it may be necessitated to more distinct, accurate, and orderly thinking, as this is the condition of distinct, accurate, and orderly communication. Of these the former requires the presence of others during the act of thought, and is, therefore, only manifested in oral instruction or in conference; whereas the latter is operative both in our oral and in our written communications. Of these in their order.

1 By reciprocally determining a higher energy of the faculties.

(a) Through Sympathy.

In the first place, then, the influence of man on man in reciprocally determining a higher energy of the faculties, is a phænomenon sufficiently manifest. By nature a social being, man has powers which are relative to, and, consequently, find their development in, the company of his fellows; and this is more particularly shown in the energies of the cognitive faculties. "As iron sharpeneth iron," says Solomon, "so a man sharpeneth the understanding of his friend."[7] This, as I have said, is effected both by fellow-feeling and by opposition. We see the effects of fellow-feeling in the necessity of an audience to call forth the exertions of the orator. Eloquence requires numbers; and oratory has only flourished where the condition of large audiences has been supplied. But opposition is perhaps still more powerful than mere sympathy in calling out the resources of the intellect.

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[1] I 27. — Ed.

[2] Cato apud Cicero, *De Fin.*, iii c 20, § 66.

[3] Seneca. *Ep.*, vi

[4] Quoted also in *Discussions*, p. 778 This line appears to have been taken from a small volume entitled *Carminum Proverbialium Loci Communes*. p. 17, Lond. 1583; but the author is not named. — Ed.

[5] Seneca, *Epist.*, vi. — Ed.

[6] Cicero, *De Fin.*, iii 20. — Ed.

[7] *Proverbs*, xxvii. 17. The authorized version is, *countenance of his friend.* Compare *Lectures on Metaphysics*, p. 261 — Ed.

(b) Through Opposition.

In the mental as well as in the material world, action and reäction are ever equal; and Plutarch[1] well observes, that as motion would cease were contention to be taken out of the physical universe, so progress in improvement would cease were contention taken out of the moral; πόλεμος ἀπάντων πατήρ.[2]

Plutarch.

"It is maintained," says the subtle Scaliger, "by Vives, that we profit more by silent meditation than by dispute. This is not true. For as fire is elicited by the collision of stones, so truth is elicited by the collision of minds. I myself (he adds) frequently meditate by myself long and intently; but in vain; unless I find an antagonist, there is no hope of a successful issue. By a master we are more excited than by a book; but an antagonist, whether by his pertinacity or his wisdom, is to me a double master."[3]

Scaliger, J. C.

But, in the second place, the necessity of communicating a piece of knowledge to others, imposes upon us the necessity of obtaining a fuller consciousness of that knowledge for ourselves. This result is to a certain extent secured by the very process of clothing our cogitations in words. For speech is an analytic process; and to express our thoughts in language, it is requisite to evolve them from the implicit into the explicit, from the confused into the distinct, in order to bestow on each part of the organic totality of a thought its precise and appropriate symbol. But to do this is in fact only to accomplish the first step towards the perfecting of our cognitions or thoughts.

2. By imposing the necessity of obtaining a fuller consciousness of knowledge for ourselves.

But the communication of thought, in its higher applications, imposes on us far more than this; and in so doing it reäcts with a still more beneficial influence on our habits of thinking. Suppose that we are not merely to express our thoughts as they spontaneously arise; suppose that we are not merely extemporaneously to speak, but deliberately to write, and that what we are to communicate is not a simple and easy, but a complex and difficult, matter.

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[1] *Vita Agesilai. Opera*, 1599, vol. i. p. 598.—ED.

[2] Heraclitus. Cf. Plutarch, *De Is. et Osir.*, p. 370. Brandis, *Gesch der Philos.*, i. p. 158.—ED.

[3] *Exercit.*, f. 420. [For a criticism of Scaliger's remark as regards Vives, see *Discussions*, p. 773.—ED.]

Influence of Composition and Instruction in perfecting our Knowledge.

Godwin quoted.

In this case, no man will ever fully understand his subject who has not studied it with the view of communication, while the power of communicating a subject is the only competent criterion of his fully understanding it. "When a man," says Godwin, "writes a book of methodical investigation, he does not write because he understands the subject, but he understands the subject because he has written. He was an uninstructed tyro, exposed to a thousand foolish and miserable mistakes, when he began his work, compared with the degree of proficiency to which he has attained when he has finished it. He who is now an eminent philosopher, or a sublime poet, was formerly neither the one nor the other. Many a man has been overtaken by a premature death, and left nothing behind him but compositions worthy of ridicule and contempt, who, if he had lived, would perhaps have risen to the highest literary eminence. If we could examine the school exercises of men who have afterwards done honor to mankind, we should often find them inferior to those of their ordinary competitors. If we could dive into the portfolios of their early youth, we should meet with abundant matter for laughter at their senseless incongruities, and for contemptuous astonishment."[1]

Aristotle

"The one exclusive sign," says Aristotle, "that a man is thoroughly cognizant of anything, is that he is able to teach it;"[2] and Ovid,[3] —

> "Quodque parum novit nemo docere potest."

Plato.
Seneca

In this reäctive effect of the communication of knowledge in determining the perfection of the knowledge communicated, originated the scholastic maxim *Doce ut discas*, — a maxim which has unfortunately been too much overlooked in the schemes of modern education. In former ages, *teach that you may learn* always constituted one at least of the great means of intellectual cultivation. "To teach," says Plato, "is the way for a man to learn most and best."[4] "Homines dum docent discunt," says Seneca.[5] "In teaching," says

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[1] *Enquirer*, part i. Essay iv. pp. 23, 24, ed. 1797. — Ed.

[2] *Metaphys.*, i. 1. Quoted in *Discussions*, p. 765. — Ed.

[3] *Tristia*, ii. 348. — Ed.

[4] Pseudo-Plato, *Epinomis*, p. 989. — Ed.

[5] *Epist.*, 7. — Ed.

Clement of Alexandria.

Dionysius Cato.

Clement of Alexandria,[1] "the instructor often learns more than his pupils." "Disce sed a doctis; indoctos ipse doceto," is the precept of Dionysius Cato;[2] and the two following were maxims of authority in the discipline of the middle ages. The first —

> "Multa rogare, rogata tenere, retenta docere,
> Haec tria, discipulum faciunt superare magistrum."[3]

The second —

> "Discere si quaeris doceas; sic ipse doceris;
> Nam studio tali tibi proficis atque sodali."[4]

Vives.

Sanderson.

This truth is also well enforced by the great Vives. "Doctrina est traditio eorum quae quis novit ei qui non novit. Disciplina est illius traditionis acceptio; nisi quod mens accipientis impletur, dantis vero non exhauritur, — imo communicatione augetur eruditio, sicut ignis, motu atque agitatione. Excitatur enim ingenium, et discurrit per ea quae ad præsens negotium pertinent: ita invenit atque excudit multa, et quae in mentem non veniebant cessanti, docenti, aut disserenti occurrunt, calore acuente vigorem ingenii. Idcirco, nihil est ad magnam eruditionem perinde conducens, ut docere."[5] The celebrated logician, Dr. Robert Sanderson, used to say: "I learn much from my master, more from my equals, and most of all from my disciples."[6]

Influence of the communication of Knowledge on those to whom it is addressed.

But I have occupied perhaps too much time on the influence of the communication of knowledge on those by whom it is made; and shall now pass on to the consideration of its influence on those to whom it is addressed. And in treating of communication in this respect, I shall, in the first place, consider it as One-sided, and, in the second, as Reciprocal or Bilateral.

The Unilateral Communication of knowledge, or Instruction, is of two kinds, for it is either Oral or Written; but as both these species of instruction propose the same end, they are both, to a certain extent, subject to the same laws.

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[1] *Stromata*, lib. i. p. 275, edition Sylb., Διδάσκων τις μανθάνει πλεῖον, καὶ λέγων συνακροαται πολλάκις τοῖς ἐπακούουσιν αὐτοῦ. — ED

[2] IV. 29. — ED.

[3] [Crenius, p 581 ] [*Gabrielis Naudæi Syntagma de Studio Liberali.* Included in the *Consilia et Methodi Aureæ studiorum optime instituendorum*, collected by Th. Crenius, Rotterdam, 1692. The lines are quoted as from an anonymous author. — ED.]

[4] Given without author's name in the *Carminum Proverbialum Loci Communes*, Lond. 1583, p. 17. See above, p. 480, note 4. — ED.

[5] *De Anima*, p. 89.

[6] [*Reason and Judgment, or Special Remarks of the Life of the Renowned Dr. Sanderson*, p. 10 London: 1663.]

1. Instruction, — Oral and Written.

Oral and Written Instruction have each their peculiar advantages.

Oral instruction, — its advantages.

(a) More natural, therefore more impressive.

Theophrastus.

In the first place, instruction by the living voice has this advantage over that of books, that, as more natural, it is more impressive. Hearing rouses the attention and keeps it alive far more effectually than reading. To this we have the testimony of the most competent observers. "Hearing," says Theophrastus,[1] "is of all the senses the most pathetic," that is, it is the sense most intimately associated with sentiment and passion. "Multo magis," says the younger Pliny, "multo magis *viva vox* afficit. Nam, licet acriora sunt quæ legas, altius tamen in animo sedent quæ pronuntiatio, vultus, habitus, gestus etiam dicentis adfigit."[2]

Younger Pliny

Valerius Maximus

"Plus prodest," says Valerius Maximus, "*docentem audire*, quam in libris studere; quia vehementior fit impressio in mentibus audientium, ex visu doctoris et auditu, quam ex studio et libro."[3]

St. Jerome.

And St. Jerome — "Habet nescio quid latentis energiæ *viva vox*; et in aures discipuli de doctoris ore transfusa, fortius sonat."[4]

(b) Less permanent, therefore more attended to.

A second reason why our Attention (and Memory is always in the ratio of Attention) to things spoken is greater than to things read, is that what is written we regard as a permanent possession to which we can always recur at pleasure; whereas we are conscious that the "winged words" are lost to us forever, if we do not catch them as they fly. As Pliny hath it: "Legendi semper est occasio; audiendi non semper."[5]

A third cause of the superior efficacy of oral instruction is that man is a social animal. He is thus naturally disposed to find pleasure in society, and in the performance of the actions performed by those with whom he consorts. But reading is a solitary, hearing is a social act. In reading, we are not determined to attend by any fellow-feeling with others attending; whereas in hearing, our attention is not only engaged by our sympathy with the speaker, but by our sympathy with the other attentive auditors around us.

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[1] Οὐκ ἂν ἀηδῶς δ' οἶμαι σε προσακοῦσαι περὶ τῆς ἀκουστικῆς αἰσθήσεως, ἣν ὁ Θεόφραστος παθητικωτάτην εἶναι φησι πασῶν. Plutarch. *De Auditione, sub init.* — Ed.

[2] *Epist.*, ii. 3. — Ed.

[3] [Thomas Hibernicus, p. 330.] [The above passage is quoted as from Valerius, lib. viii., in the *Flores* of Thomas Hibernicus, and in the *Anthologia* of Langius, under the article *Doctrina*. It is not, however, to be found in that author — Ed.]

[4] *Epist.*, ciii. *Opera*, Antv. 1579, tom. iii. p. 337. — Ed.

[5] *Epist.* ii. 3. — Ed

(c) Hearing a social act.

Such are the causes which concur in rendering Oral Instruction more effectual than Written. "M. Varillas," says Menage (and Varillas was one of the most learned of modern historians, — and Menage one of the most learned of modern scholars), "M. Varillas himself told me one day, that of every ten things he knew, he had learned nine of them in conversation. I myself might say nearly the same thing."[1]

Menage quoted.

On the other hand, Reading, though only a substitute for Oral Instruction, has likewise advantages peculiar to itself. In the first place, it is more easily accessible. In the second, it is more comprehensive in its sphere of operation. In the third, it is not transitory with the voice, but may again and again be taken up and considered, so that the object of the instruction may thus more fully be examined and brought to proof. It is thus manifest, that oral and written instruction severally supply and severally support each other; and that, where this is competent, they ought always to be employed in conjunction. Oral instruction is, however, in the earlier stages of education, of principal importance; and written ought, therefore, at first only to be brought in as a subsidiary. A neglect of the oral instruction, and an exclusive employment of the written, — the way in which those who are self-taught (the autodidacti) obtain their education, — for the most part betrays its one-sided influence by a contracted cultivation of the intellect, with a deficiency in the power of communicating knowledge to others.

Reading, — its advantages.
(a) More easily accessible
(b) More comprehensive.
(c) More permanent.

Oral instruction necessarily supposes a speaker and a hearer; and written instruction a writer and a reader. In these, the capacity of the speaker and of the writer must equally fulfil certain common requisites. In the first place, they should be fully masters of the subject with which their instruction is conversant; and in the second, they should be able and willing to communicate to others the knowledge which they themselves possess. But in reference to these several species of instruction, there are various special rules that ought to be attended to by those who would reap the advantages they severally afford. I shall commence with Written Instruction, and comprise the rules by which it ought to be regulated, in the following paragraph.

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[1] *Menagiana*, tom. iv. p. 111, ed. 1715. — Ed.

Par. CXIII. Written Instruction, and its employment as a means of intellectual improvement.

¶ CXIII. In regard to Written Instruction, and its profitable employment as a means of intellectual improvement, there are certain rules which ought to be observed, and which together constitute the Proper Method of Reading. These may be reduced to three classes, as they regard, 1°, The Quantity, 2°, The Quality, of what is to be read, or, 3°, The Mode of reading what is to be read.

I. As concerns the Quantity of what is to be read, there is a single rule, — Read much, but not many works (multum non multa).

II. As concerns the Quality of what is to be read, — there may be given five rules. 1°, Select the works of principal importance, estimated by relation to the several sciences themselves, or to your particular aim in reading, or to your individual disposition and wants. 2°, Read not the more detailed works upon a science, until you have obtained a rudimentary knowledge of it in general. 3°, Make yourselves familiar with a science in its actual or present state, before you proceed to study it in its chronological development. 4°, To avoid erroneous and exclusive views, read and compare together the more important works of every sect and party. 5°, To avoid a one-sided development of mind, combine with the study of works which cultivate the Understanding, the study of works which cultivate the Taste.

III. As concerns the Mode or Manner of reading itself, there are four principal rules. 1°, Read that you may accurately remember, but still more, that you may fully understand. 2°, Strive to compass the general tenor of a work, before you attempt to judge of it in detail. 3°, Accommodate the intensity of the reading to the importance of the work. Some books are, therefore, to be only dipped into; others are to be run over rapidly; and others to be studied long and sedulously. 4°, Regulate on the same principle the extracts which you make from the works you read.[1]

I. In reference to the head of Quantity, the single rule is —

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[1] Cf. Krug. *Logik*, § 180. — Ed. [Fischaber, *der Hodegetik*, § 53 p. 196; 1832. **Magirus v. *Logik*, p. 188. ed 1818.** Scheidler, *Grundriss Lectio.*]

Explication.

I. Quantity to be read.

Rule.

Solomon.

Quintilian.

Younger Pliny.

Seneca.

Luther quoted.

Read much, but not many works. Though this golden rule has risen in importance, since the world, by the art of printing, has been overwhelmed by the multitude of books, it was still fully recognized by the great thinkers of antiquity. It is even hinted by Solomon, when he complains that "of making many books there is no end."[1] By Quintilian, by the younger Pliny, and by Seneca, the maxim, "multum legendum esse, non multa," is laid down as the great rule of study.[2] "All," says Luther, in his Table Talk,[3] "who would study with advantage in any art whatsoever, ought to betake themselves to the reading of some sure and certain books oftentimes over; for to read many books produceth confusion, rather than learning, like as those who dwell everywhere, are not anywhere at home." He alludes here to the saying of Seneca, "Nusquam est qui ubique est."[4] "And like as in society, we use not daily the community of all our acquaintances, but of some few selected friends, even so likewise ought we to accustom ourselves to the best books, and to make the same familiar unto us, that is, to have them, as we use to say, at our fingers' ends."

Sanderson.

Lord Burleigh.

Herder.

The great logician, Bishop Sanderson, to whom I formerly referred, as his friend and biographer Isaac Walton informs us, said "that he declined reading many books; but what he did read were well chosen, and read so often that he became very familiar with them. They were principally three, — Aristotle's *Rhetoric*, Aquinas's *Secunda Secundæ*, and Cicero, particularly his *Offices*."[5] The great Lord Burleigh, we are told by his biographer, carried Cicero *De Officiis*, with Aristotle's *Rhetoric*, always in his bosom; these being complete pieces, "that would make both a scholar and an honest man." "Our age," says Herder, "is the reading age;" and he adds, "it would have been better, in my opinion, for the world and for science, if, instead of the multitude of books which now overlay us, we possessed only a few works good and sterling, and which as few, would, therefore, be more diligently and profoundly studied."[6] I might quote to you many other testimonies to the same effect; but testimonies are useless in support of so manifest a truth.

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[1] *Eccles.* xii. 12. — Ed.

[2] Quintilian, x. 1, 59. Pliny, *Ep.*, vii. 9. Seneca, *De Tranquill. Animi*, c. 9. *Epist.*, 2, 45. — Ed.

[3] No. dccclxiv. *Of Learned Men.* — Ed.

[4] *Epist.*, ii. — Ed.

[5] See Walton's *Lives of Donne, Wotton, Hooker, Herbert, and Sanderson*, vol. ii., p. 287, ed. Zouch, York, 1817. — Ed.

[6] *Briefe uber das Stud. der Theol* B. xlix., *Werke*, xiv. 267, ed. 1829. — Ed.

End of Reading.

For what purpose, — with what intent, do we read? We read not for the sake of reading, but we read to the end that we may think. Reading is valuable only as it may supply to us the materials which the mind itself elaborates. As it is not the largest quantity of any kind of food, taken into the stomach, that conduces to health, but such a quantity of such a kind as can be best digested; so it is not the greatest complement of any kind of information that improves the mind, but such a quantity of such a kind as determines the intellect to most vigorous energy. The only profitable reading is that in which we are compelled to think, and think intensely; whereas that reading which serves only to dissipate and divert our thought, is either positively hurtful, or useful only as an occasional relaxation from severe exertion. But the amount of vigorous thinking is usually in the inverse ratio of multifarious reading. Multifarious reading is agreeable; but, as a habit, it is, in its way, as destructive to the mental as dram-drinking is to the bodily health.

II. Quality of what is to be read.

First Rule

II. In reference to the quality of what is to be read, the First of the five rules is — 'Select the works of principal importance, in accommodation either to the several sciences themselves, to your particular aim in reading, or to your individual disposition and wants.' This rule is too manifestly true to require any illustration of its truth. No one will deny that for the accomplishment of an end you ought to employ the means best calculated for its accomplishment. This is all that the rule inculcates. But while there is no difficulty about the expediency of obeying the rule, there is often considerable difficulty in obeying it. To know what books ought to be read in order to learn a science, is in fact frequently obtained after the science has been already learned. On this point no general advice can be given. We have, on all of the sciences, works which profess to supply the advice which the student here requires. But in general, I must say, they are of small assistance in pointing out what books we should select, however useful they may be in showing us what books exist upon a science. In this respect, the British student also labors under peculiar disadvantages. The libraries in this country are, one and all of them, wretchedly imperfect; and there are few departments of science in which they are not destitute even of the works of primary necessity, — works which, from their high price, but more frequently from the difficulty of procuring them, are beyond the reach of ordinary readers.

Under the head of Quality the Second Rule is — 'Read not the more detailed works upon a science, until you have obtained a rudimentary knowledge of it in general.' The expediency of this rule is sufficiently apparent. It is altogether impossible to read with advantage an extensive work on any branch of knowledge, if we are not previously aware of its general bearing, and of the relations in which its several parts stand to each other. In this case, the mind is overpowered and oppressed by the mass of details presented to it, — details, the significance and subordination of which it is as yet unable to recognize. A conspectus, — a survey of the science as a whole, ought, therefore, to precede the study of it in its parts; we should be aware of its distribution, before we attend to what is distributed, — we should possess the empty frame-work, before we collect the materials with which it is to be filled. Hence the utility of an encyclopædical knowledge of the sciences in general, preliminary to a study of the several sciences in particular; that is, a summary knowledge of their objects, their extent, their connection with each other. By this means the student is enabled to steer his way on the wide ocean of science. By this means he always knows whereabouts he is, and becomes aware of the point towards which his author is leading him.

Second Rule.

In entering upon the study of such authors as Plato, Aristotle, Descartes, Spinoza, Leibnitz, Locke, Kant, etc., it is, therefore, proper that we first obtain a preparatory acquaintance with the scope, both of their philosophy in general, and of the particular work on which we are about to enter. In the case of writers of such ability this is not difficult to do, as there are abundance of subsidiary works, affording the preliminary knowledge of which we are in quest. But in the case of treatises where similar assistance is not at hand, we may often, in some degree, prepare ourselves for a regular perusal, by examining the table of contents, and taking a cursory inspection of its several departments. In this respect, and also in others, the following advice of Gibbon to young students is highly deserving of attention. "After a rapid glance (I translate from the original French) — after a rapid glance on the subject and distribution of a new book, I suspend the reading of it, which I only resume after having myself examined the subject in all its relations, — after having called up in my solitary walks all that I have read, thought, or learned in regard to the subject of the whole book, or of some chapter in particular. I thus place myself in a condition to estimate what the author may add to my general stock of knowledge; and I am thus

Gibbon quoted.

sometimes favorably disposed by the accordance, sometimes armed by the opposition, of our views."[1]

Third Rule.

The Third Rule under the head of Quality is — 'Make yourselves familiar with a science in its present state, before you proceed to study it in its chronological development.' The propriety of this procedure is likewise manifest. Unless we be acquainted with a science in its more advanced state, it is impossible to distinguish between what is more or less important, and, consequently, impossible to determine what is or is not worthy of attention in the doctrines of its earlier cultivators. We shall thus also be overwhelmed by the infinitude of details successively presented to us; all will be confusion and darkness, where all ought to be order and light. It is thus improper to study philosophy historically, or in its past progress, before we have studied it statistically, or in its actual results.

Fourth Rule.

The Fourth Rule under the same head is — 'To avoid erroneous and exclusive views, read and compare together the more important works of every party.' In proportion as different opinions may be entertained in regard to the objects of a science, the more necessary is it that we should weigh with care and impartiality the reasons on which these different opinions rest. Such a science, in particular, is philosophy, and such sciences, in general, are those which proceed out of philosophy. In the philosophical sciences, we ought, therefore, to be especially on our guard against that partiality which considers only the arguments in favor of particular opinions. It is true that in the writings of one party we find adduced the reasons of the opposite party; but frequently so distorted, so mutilated, so enervated, that their refutation occasions little effort. We must, therefore, study the arguments on both sides, if we would avoid those one-sided and contracted views which are the result of party-spirit. The precept of the Apostle, "Test all things, hold fast by that which is good," is a precept which is applicable equally in philosophy as in theology, but a precept that has not been more frequently neglected in the one study than in the other.

Fifth Rule.

The Fifth Rule under the head of Quality is — 'To avoid a one-sided development of mind, combine with the study of works which cultivate the Understanding, the study of works which cultivate the Taste.' The propriety of this rule requires no elucidation; I, therefore, pass on to the third head — viz., the Manner of reading itself; under which the First Rule is — 'Read that you may accurately remember, but still more that you may fully understand.'

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[1] The substance of the above passage is given in English, in Gibbon's *Memoirs of my Life and Writings*, pp. 54, 55; ed. 1837. The French original is quoted by Scheidler, *Hodegetik*, § 55, p. 204. — Ed.

III. Manner of Reading.

First Rule

This also requires no comment. Reading should not be a learning by rote, but an act of reflective thinking. Memory is only a subsidiary faculty, — is valuable merely as supplying the materials on which the understanding is to operate. We read, therefore, principally, not to remember facts, but to understand relations. To commit, therefore, to memory what we read, before we elaborate it into an intellectual possession, is not only useless but detrimental; for the habit of laying up in memory what has not been digested by the understanding, is at once the cause and the effect of mental weakness.

Second Rule.

The Second Rule under this head is — 'Strive to compass the general tenor of a work, before you attempt to judge of it in detail.' Nothing can be more absurd than the attempt to judge a part before comprehending the whole; but unfortunately nothing is more common, especially among professional critics, — reviewers. This proceeding is, however, as frequently the effect of wilful misrepresentation, as of unintentional error.

Third Rule.

The Third Rule under this head is — 'Accommodate the intensity of the reading to the importance of the work. Some books are, therefore, to be only dipped into; others are to be run over rapidly; and others to be studied long and sedulously.' All books are not to be read with the same attention; and, accordingly, an ancient distinction was taken of reading into *lectio cursoria* and *lectio stataria*. The former of these we have adopted into English, cursory reading being a familiar and correct translation of *lectio cursoria*. But *lectio stataria* cannot be so well rendered by the expression of *stationary reading*.

*Lectio cursoria.*

*Lectio stataria.*

Bacon quoted.

"Read not," says Bacon, in his Fiftieth Essay — "read not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider. Some books are to be tasted, others are to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read, but not curiously; and some few to be read wholly and with diligence and attention. Some books also may be read by deputy, and extracts made of them by others; but that would be only in the less important arguments, and the meaner sort of books; else distilled books are, like common distilled waters, fleshy things." "One kind of books," says the great historian, Johann von Müller,[1] "I read with great rapidity, for in these there is much dross to throw aside, and little gold to be found; some, however, there are all gold and diamonds, and he who, for example, in Tacitus can read more than twenty pages in four hours, certainly does not understand him."

Johann von Müller

Rapidity in reading depends, however, greatly on our acquaintance with the subject of discussion. At first, upon a science we can only read with profit few books, and laboriously. By degrees, however, our knowledge of the matters treated expands, the reasonings appear more manifest, — we advance more easily, until at length we are able, without overlooking anything of importance, to read with a velocity which appears almost incredible for those who are only commencing the study.

Fourth Rule.

The Fourth Rule under this head is — 'Regulate on the same principle the extracts which you make from the works you read.'

So much for the Unilateral Communication of thought, as a mean of knowledge. We now proceed to the Mutual Communication of thought, — Conference.

Conference,— of two kinds.

This is either mere Conversation, — mere Dialogue, or Formal Dispute, and at present we consider both of these exclusively only as a means of knowledge, — only as a means for the communication of truth.

1. Dialogue.

The employment of Dialogue as such a mean, requires great skill and dexterity; for presence of mind, confidence, tact, and pliability are necessary for this, and these are only obtained by exercise, independently of natural talent. This was the method which Socrates almost exclusively employed in the communication of knowledge; and he called it his *art of intellectual midwifery*, because in its application truth is not given over by the master to the disciple, but the master, by skilful questioning, only helps the disciple to deliver himself of the truth explicitly, which his mind had before held implicitly. This method is not, however, applicable to all kinds of knowledge, but only to those which the human intellect is able to evolve out of itself, that is, only to the cognitions of Pure Reason. Disputation is of two principal kinds, inasmuch as it is oral or written; and in both cases, the controversy may be conducted either by the rules of strict logical disputation, or left to the freedom of debate. Without entering on details, it may be sufficient to state, in regard to Logical Disputation, that it is here essential that the point in question, — the *status controversiæ*, — the thesis, should, in the first place, be accurately determined, in order to prevent all logomachy, or mere verbal wrangling. This being done, that disputant who denies the thesis, and who is called the *opponent*, may either call upon the disputant who affirms the thesis, and who is called the *defendant*, to allege an argument in its support, or he may at once himself produce his counter-argument. To avoid, however, all misunderstanding, the opponent should also advance an antithesis, that is, a proposition conflictive with the thesis, and when this has been denied by the defendant the process of argumentation commences. This proceeds in regular syllogisms, and is governed by definite rules, which are all so calculated that the discussion is not allowed to wander from the point at issue, and each disputant is compelled, in reference to every syllogism of his adversary, either to admit, or to deny, or to distinguish.[1] These rules you will find in most of the older systems of Logic; in particular I may refer you to them as detailed in Heerebord's *Praxis Logica*, to be found at the end of his edition of the *Synopsis* of Burgersdicius. The practice of disputation was long and justly regarded as the most important of academical exercises; though liable to abuse, the good which it certainly ensures greatly surpasses the evil which it may accidentally occasion.

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[1] *Werke*, iv. 177. Cf. xvii. 253. Quoted by Scheidler, *Hodegetik*, § 55, p. 204. — Ed.

2. Disputation, — Oral and Written.
Academical disputation.

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[1] Cf. Krug, *Logik*, § 186. Anm. 2. Scheidler, *Hodegetik*, § 45, p. 138. — ED

# APPENDIX.

## I.

### THE CHARACTER AND COMPREHENSION OF LOGIC. — A FRAGMENT.

(See page 3.)

In the commencement of a course of academical instruction, there are usually two primary questions which obtrude themselves; and with the answer to these questions I propose to occupy the present Lecture.

The first of these questions is, — What is the character and comprehension of the subject to be taught? The second, — What is the mode of teaching it? In regard to the former of these, the question, — What is to be taught, — in the present instance is assuredly not superfluous. The subject of our course is indeed professedly Logic; but as under that rubric it has been too often the practice, in our Scottish Universities, to comprehend almost everything except the science which that name properly denotes, it is evident that the mere intimation of a course of Lectures on Logic does not of itself definitely mark out what the professor is to teach, and what the student may rely on learning.

I shall, therefore, proceed to give you a general notion of what Logic is, and of the relation in which it stands to the other sciences; for Logic — Logic properly so called — is the all-important science in which it is at once my duty and my desire fully and faithfully to instruct you.

The very general — I may call it the very vague — conception which I can at present attempt to shadow out of the scope and nature of Logic, is of course not intended to anticipate what is hereafter to be articulately stated in regard to the peculiar character of this science.

All science, all knowledge, is divided into two great branches; for it is either, 1°, Conversant about Objects Known, or, 2°, Conversant about the Manner of knowing them, in other words, about the laws or conditions under which such objects are cognizable. The former of these is Direct Science, or Science simply; the latter, Reflex Science, — the Science of Science, or the Method of Science.

Now of these categories or great branches of knowledge, Simple Science, or Science directly conversant about Objects, is again divided into two branches;

for it is either conversant about the phænomena of the internal world, as revealed to us in consciousness, or about the phænomena of the external world, as made known to us by sense. The former of these constitutes the Science of Mind, the latter the Science of Matter; and each is again divided and subdivided into those numerous branches, which together make up nearly the whole cycle of human knowledge.

The other category — the Science of Science, or the Methodology of Science — falls likewise into two branches, according as the conditions which it considers are the laws which determine the possibility of the mind, or subject of science, knowing, or the laws which determine the possibility of the existence, or object of science, being known: Science, I repeat, considered as reflected upon its own conditions, is twofold, for it either considers the laws under which the human mind can know, or the laws under which what is proposed by the human mind to know, can be known. Of these two sciences of science, the former — that which treats of those conditions of knowledge which lie in the nature of thought itself — is Logic, properly so called; the latter, — that which treats of those conditions of knowledge which lie in the nature, not of thought itself, but of that which we think about, — this has as yet obtained no recognized appellation, no name by which it is universally and familiarly known. Various denominations have indeed been given to it in its several parts, or in its special relations; thus it has been called *Heuretic*, in so far as it expounds the rules of Invention or Discovery, *Architectonic*, in so far as it treats of the method of building up our observations into system; but hitherto it has obtained, as a whole, no adequate and distinctive title. The consequence, or perhaps the cause, of this want of a peculiar name to mark out the second science of science, as distinguished from the first, is that the two have frequently been mixed up together, and that the name of *Logic* has been stretched so as to comprehend the confused assemblage of their doctrines. Of these two sciences of the conditions of knowledge, the one owes its systematic development principally to Aristotle, the other to Bacon; though neither of these philosophers has precisely marked or rigidly observed the limits which separate them from each other; and from the circumstance, that the latter gave to his great Treatise the name of *Organum*, — the name which has in later times been applied to designate the complement of the Logical Treatises of the former, — from this circumstance, I say, it has often been supposed that the aim of Bacon was to build up a Logic of his own upon the ruins of the Aristotelic. Nothing, however, can be more erroneous, either as to Bacon's views, or as to the relation in which the two sciences mutually stand. These are not only not inconsistent, they are in fact, as correlative, each necessary to, each dependent on, the other; and although they constitute two several doctrines, which must be treated in the first instance each by and for itself, they are, however, in the last resort only two phases, — two members, of one great doctrine of method, which considers, in the counter relations of thought to the object, and of the object to thought, the universal conditions by which the possibility of human knowledge is regulated and defined.

But allowing the term *Logic* to be extended so as to denote the genus of which these opposite doctrines of Method are the species, it will, however, be necessary to add a difference by which these special Logics may be distinguished from each other, and from the generic science of which they are the constituents. The doctrine, therefore, which expounds the laws by which our scientific procedure should be governed, in so far as these lie in the forms of thought, or in the conditions of the mind itself, which is the subject in which knowledge inheres, — this science may be called *Formal*, or *Subjective*, or *Abstract*, or *Pure Logic*. The science, again, which expounds the laws by which our scientific procedure should be governed, in so far as these lie in the contents, materials, or objects, about which knowledge is conversant, — this science may be called *Material*, or *Objective*, or *Concrete*, or *Applied Logic*.

Now it is Logic, taken in its most unexclusive acceptation, which will constitute the object of our consideration in the following course. Of the two branches into which it falls, Formal Logic, or Logic Proper, demands the principal share of our attention, and this for various reasons. In the first place, considered in reference to the quantity of their contents, Formal Logic is a far more comprehensive and complex science than Material. For, to speak first of the latter: — if we abstract from the specialities of particular objects and sciences, and consider only the rules which ought to govern our procedure in reference to the object-matter of the sciences in general, — and this is all that a universal logic can propose, — these rules are few in number, and their applications simple and evident. A Material or Objective Logic, except in special subordination to the circumstances of particular sciences, is, therefore, of very narrow limits, and all that it can tell us is soon told. Of the former, on the other hand, the reverse is true. For though the highest laws of thought be few in number, and though Logic proper be only an articulate exposition of the universal necessity of these, still the steps through which this exposition must be accomplished are both many and multiform.

In the second place, the doctrines of Material Logic are not only far fewer and simpler than those of Formal Logic, they are also less independent; for the principles of the latter once established, those of the other are either implicitly confirmed, or the foundation laid on which they can be easily rested.

In the third place, the study of Formal Logic is a more improving exercise; for, as exclusively conversant with the laws of thought, it necessitates a turning back of the intellect upon itself, which is a less easy, and, therefore, a more invigorating, energy, than the mere contemplation of the objects directly presented to our observation.

In the fourth place, the doctrines of Formal Logic are possessed of an intrinsic and necessary evidence; they shine out by their native light, and do not require any proof or corroboration beyond that which consciousness itself supplies. They do not, therefore, require, as a preliminary condition, any apparatus of acquired knowledge. Formal Logic is, therefore, better fitted than Material for the purposes of academical instruction; for the latter, primarily conversant with the conditions of the external world, is in itself a less invigorating exercise, as determining the mind to a feebler and more ordinary exertion, and, at the same time, cannot adequately be understood without the previous possession of such a complement of information as it would be unreasonable to count upon in the case of those who are only commencing their philosophical studies.

## II.

## GENUS OF LOGIC.

(See page 7.)

### I. — Science.

A. Affirmative. — Stoici (v. Alexander Aphrod. *In Topica*, Prooem.; Diogenes Laertius, *Vita Zenonis*, L. vii., § 42). "Plato et Platonici et Academici omnes" (v. Camerarius, *Selectæ Disput. Philos.* Pars. i., qu. 3, p. 30).

#### (a) SPECULATIVE SCIENCE.

Toletus, *In Un. Arist. Log.*, *De Dial. in Communi*, Qu. ii., iv. Suarez. *Disp. Metaph.*, Disp. i. § iv. 26; Disp. xliv. § xiii. 54. "Communiter Thomistæ, ut Capreolus, Sotus, Masius, Flandra, Soncinas, Javellus:. Omnes fere Scotistæ cum Scoto, ut Valera, Antonius Andreas, etc." (v. Ildephonsus de Penafiel, *Logicæ Disputationes*, Disp. i. qu. 4. *Cursus*, p. 79.) For Aquinas, Durandus, Niphus, Canariensis, see Antonius Ruvio, *Com. in Arist. Dialect.*, Proœm. qu. 5. For Bacchonus, Javellus, Averroes, see Conimbricenses, *In Arist. Dial.* Proœm. Q. iv. art. 5. Lalemandet, *Cursus Phil.*, *Logica*, Disp. iii. part iii. Derodon, *Logica Restit.*, *De Genere*, p. 45. Camerarius, *Disp. Phil.*, Pars i., qu. 3. 4. (That *Logica docens* a true science.) For Pseudo-Augustinus, Avicenna, Alpharabius, see Conimbricenses, *Com. in Arist. Dial.* Proœm. Qu. iv. art. 3. For Boethius, Mercado, Vera Cruce, Montanesius, see Masius, *Com. in Porph. et in Universam Aristotelis Logicam*, Sect. i., Proœm. qu. v. *et seq.* Poncius, *De Nat. Log.*, Disp. ii., concl. 2. For Rapineus, Petronius, Faber, see Camerarius, *Sel. Disp. Phil.*, Pars i., qu. 4, p. 44.

#### (b) PRACTICAL SCIENCE.

Conimbricenses, *In Universam Aristotelis Dialecticam.* Proœm. Qu. iv., art. 5. Fonseca, *In Metaph.* L. ii. c. 3, qu. 1, § 7. For Venetus, Albertus Magnus, Jandunus, see Ruvio, *l. c.* Schuler, *Philosophia nova Methodo Explicata*, Pars Prior, L. v. ex. i., p. 306. (1603). D'Abra de Raconis, *Summa Totius Philosophiæ*, *Log. Præl.*, c. i. Isendoorn, *Cursus Logicus*, L. i., c. 2, qu. 7. Biel, *In Sentent.*, L. ii. Prol. Occam, *Summa Totius Logicæ*, D. xxxix. qu. 6. For Aureolus, Bern. Mirandulanus, see *Conimbricenses*, *l. c.* For Mathisius, Murcia, Vasquez, Eckius, see Camerarius, *Sel. Disp. Phil.* Pars i., qu. 4, p. 44. Ildephonsus de Penafiel, *Log. Disp.* D. i. qu. 4, sect. 2. Oviedo, *Cursus Philosophicus. Log.*, Contr. Proœm. ii. 5. Arriaga, *Cursus Philosophicus*, Disp. iii. § 4.

#### (c) SPECULATIVE AND PRACTICAL.

Hurtado de Mendoza, *Log. Disp.* D. ii. § 2.

B. Negative. — For almost all the Greek commentators, see Zabarella, *Opera*

*Logica, De Nat. Log.*, L. i. c. 5, and Smiglecius, *Logica*, D. ii. qu. 5. See also Ildephonsus de Penafiel, *Disp. Log.* D. i. qu. 1, § 1, p. 67.

## II. — Art.

Scheibler, *Opera Logica*, Pars. i. c. 1, p. 49. J. C. Scaliger, *Exercitationes*, Exerc. i. 3. G. J. Vossius, *De Natura Artium*, L. iv., c. 2, § 4. Balforeus, *In Org.* Q. v. § 6, Prœm., p. 31. Burgersdicius, *Institutiones Logicæ*. Lib. i. c. 1. Pacius, *Comm. in Org.* p. 1. Sanderson, *Log. Artis Compendium*, L. i. c. 1, p. 1, Cf. p. 192. Aldrich, *Artis Log. Compendium*. L. i. c. 1, p. 1. Hildenius, *Quæstiones et Commentaria in Organon*, p. 579 (1585). Goclenius, *Problemata Logica et Philosophica*. Pars. i. qu. 3. Ramus, *Dialectica*. L. i. c. 1. Augustinus, *De Ordine*, ii. c. 15. Cicero, *De Claris Oratoribus*, c. 41. *De Oratore*, L. ii., c. 38. Lovanienses, *Com. in Arist. Dial.* Præf. p. 3. Rodolphus Agricola, *De Dialecticæ Inventione*, L. ii. p. 255. Monlorius (Bapt.), *Comm. in Anal. Pr.* Præf. Nunnesius, *De Constitut. Dial.*, p. 43. Downam (Ramist), *Comm. in Ram. Dial.*, L. i. c. 1. p. 3. Paraeus, *Ars Logica*, p. 1, 1670. For Horatius Cornachinus, Ant. Bernardus Mirandulanus, Flamminius Nobilius, see Camerarius, *Sel. Disp. Phil.* Pars. i. q. 3, p. 30.

## III. — Science and Art.

Lalemandet, *Log.*, Disp. iii. Part iii. el. 4 (*Logica utens*, an art ; *Logica docens*, a speculative science.) Tartaretus, *In P. Hispanum*, f. 2 (Practical Science and Art.) P. Hispanus, *Copulata Omn. Tractat. Pet. Hisp. Parv. Logical.* T. i. f. 10, 1490. *Philosophia Vetus et Nova in Regia Burgundia olim Pertractata, Logica*, T. I., pp. 58, 59. 4th ed. London, 1685. Tosca, *Comp. Phil. Log.*, Tr. i. l. iv. c. 4, p. 208 (Practical Science and Art). Purchot, *Instit. Phil.*, T. I. Procem. p. 36. Eugenius, Λογικὴ, pp. 140, 141. Dupleix, *Logique*, p. 37. Facciolati, *Rudimenta Logicæ*, p. 5. Schmier, *Philosophia Quadripartita* (v. Henmannus, *Acta Philosoph.* iii. p. 67). Aquinas (in Caramuel, *Phil. Realis et Rationalis*, Disp. ii. p. 3).

## IV. — Neither Science nor Art, but Instrument, Organ, or Habit, or Instrumental Discipline.

Philoponus, *In An. Prior.*, *initio*. For Ammonius (*Præf. in Præd.*), Alexander (*In Topica*, i. c. 4 ; *Metaph.* ii. t. 15). Simplicius, (*Præf. in Præd.*). Zabarella (*De Natura Logicæ*, L. i. c. 10.), Zimara (*In Tabula v. Absurdum*), Averroes, see Smiglecius, *Logica*, Disp. ii. qu. 6, p. 89. Aegidius, *In An. Post.* L. i. qu. 1. For Magnesius, Niger (Petrus), Villalpandeus, see Ruvio, *In Arist. Dial.*, prœm. qu. 2. F. Crellius, *Isagoge Logica*, L. i. c. 1, p. 5. P. Vallius, *Logica*, T. I. prœm. c. i. *et alibi*. Bartholinus, *Janitores Logici*, II. pp. 25 and 76. Bertius, *Logica Peripatetica*, pp. 6, 10. Themistius, *An. Post.* i. c. 24. Aquinas, *Opuscula*, 70. qu. *De Divisione Scientiæ Speculativæ*, — sed alibi *scientiam* vocat. (See Conimbricenses, *In Arist. Dial.*, T. I. qu. iv. art. 5, p. 42.) Balduinus, *In Quæsito an Logica sit Scientia*. Scaynus, *Paraphrasis in Organon* Præf. p. 9.

### V. — That, loosely taking the terms, Logic is either Art or Science or both.

Zabarella, *Opera Logica, De Nat. Log.*, L. i. c. viii. D'Abra de Raconis, *Summa Tot. Phil. Præl. Log.*, L. iii., c. 1, p. 8, ed. Colon. (Practical Science). Balforeus, *In Organon*, Q. v. §§ 1, 6, pp. 20, 32. (Art). Derodon, *Logica Restit. De Proœm. Log.*, p. 49, (Speculative Science). Crellius, *Isagoge*, pp. 1, 4. Bertius, *Logica Peripatetica*, pp. 11, 13. Aldrich, *Art. Log. Comp.*, L. ii. c. 8, T. i. (Art). Sanderson, *Log. Art. Comp. Append. Pr.*, c. 2, page 192, (Art). Conimbricenses, *In Arist. Dial.*, T. I., p. 33 (Practical Science). *Philosophia Burgundia*, T. I. pp. 56, 59. Eustachius, *Summa Philosophiæ, Dialectica Quæst. Proœm.*, i. p. 4. Nunnesius, *De Constit. Dial.*, ff. 43, 68. Scheibler, *Opera Logica*. pp. 48, 49. Scaynus, *Par. in Org.*, pp. 11, 12. Camerarius, *Sel. Disp. Phil.*, Pars i. qu. 3, pp. 31, 38 (Speculative Science). B. Pereira, *De Commun. Princip. Omn. Rer. Natural*, L. i. *De Phil.* c. 18, p. 60, 1618.

### VI. — That at once Science (part of Philosophy) and Instrument of Philosophy.

Boethius, *Præf. in Porphyr.* (a Victorino Transl.) *Opera*, p. 48. Eustachius, *Summa Philosophiæ*, p. 8 (Scientia organica et practica). For Simplicius, Alexander, Philoponus, etc., see Camerarius, *Sel. Disp. Phil.*, p. 30. Pacius, *Com. in Arist. Org.*, p. 4.

### VII. — That Question, whether Logic part of Philosophy or not, an Idle Question.

Pacius, *Com. in Arist. Org.*, p. 4. Avicenna (in Conimbricenses, *In Arist. Dial.*, Qu. iv. art. 4, T. I. p. 38).

### VIII. — That Question of whether Art, Science, etc., Idle — only Verbal.

Buffier, *Cours des Sciences, Seconde Logique*, § 421, p. 887.

Eugenius, 'Η Λογικὴ, p. 140, has the following:

"From what has been said, therefore, it clearly appears of what character are the diversities of Logic, and what its nature. For one logic is *Natural*, another *Acquired*. And of the *Natural*, there is one sort according to *Faculty*, another according to *Disposition*. And of the Acquired, there is again a kind according to *Art*, and a kind according to *Science*. And the Native Logic, according to Faculty, is the rational faculty itself with which every human individual is endowed, through which all are qualified for the knowledge and discrimination of truth, and which, in proportion as a man employs the less, the less is he removed from irrationality. But the Native Logic, according to Disposition, is the same faculty by which some, when they reason, are wont to exert their cogitations with care and attention, confusedly, indeed, and uncritically, still, however, in pursuit of the truth. The Acquired, according to Art, is the correct and corrected knowledge of the Rules, through which the intellectual energies are, without fault or failure, accomplished. But the Acquired, according to Science, is the exact and perfect knowledge both of the energies themselves, and also of the causes through which, and through which exclusively, they are capable of being directed towards the truth."

| | | |
|---|---|---|
| Logic. | Native, according to | Faculty.<br>Disposition. |
| | Acquired, according to | Art.<br>Science. |

"And thus Disposition adds to Faculty consuetude and a promptness to energize. Art, again, adds to Disposition a refinement and accuracy of Energy. Finally, Science adds to Art the consciousness of cause, and the power of rendering a reason in the case of all the Rules. And the natural logician may be able, in his random reason, to apprehend that, so to speak, one thing has determined another, although the nature of this determination may be beyond his ken. But he whose disposition is exercised by reflection and imitation, being able easily to connect thought with thought, is cognizant of the several steps of the reasoning process, howbeit this otherwise may be confused and disjointed. But he who is disciplined in the art, knows exactly that, in an act of inference, there are required three terms, and that these also should be thus or thus connected. Finally, the scientific logician understands the reason, — why three terms enter into every syllogism, — why there are neither more nor fewer, — and why they behoove to be combined in this, and in no other fashion.

"Wherefore to us the inquiry appears ridiculous, which is frequently, even to nausea, clamorously agitated concerning Logic — Whether it should be regarded as an *Art* or as a *Science*."

## III.

## DIVISIONS, VARIETIES, AND CONTENTS OF LOGIC.

(See p. 49.)

| | | |
|---|---|---|
| I. Logica, | Docens,<br>χωρὶς πραγμάτων.<br>Utens,<br>ἐν χρήσει καὶ γυμνασίᾳ πραγμάτων. | v. Timpler, *Logicæ Systema*, L. i. c. i. quæst. 2, 3. Isendoorn, *Effata*, Centuria, i. Eff. 55. Crellius, *Isagoge*, Pars Prior, L. i. c. i. p. 12. Noldius, *Logica Recognita*, Procem. p. 13.<br>Philoponus. *In. An. Pr.*, f 4. Alstedius, *Encyclopædia*, pp. 29 and 406. v. Aristotle, *Metaph.*, L vii. text, 23. |
| II. Logica, | Doctrinalis<br>Systematica [Objectiva].<br>Habitualis [Subjectiva]. | v. Timpler, *Syst. Log.*, Appendix, p. 877. Noldius, *Log. Recog.*, Procem., p. 13. |

| | | |
|---|---|---|
| III. Logica. | Pars Communis, Generalis.<br>Pars Propria, Specialis. | Adopted in different significations by Timpler, *Syst. Log.*, q. 19. p. 55. Theoph. Gale, *Logica*, pp. 6, 246. *et seq.* (1681). Crellius, *Isagoge*, P. i. L. i. c. 1, p. 3. Alstedius, *Encyclop.*, pp. 29 and 406. |
| IV. Logica, | Pura.<br>Applicata. | *N. B.* — Averroes (Pacius, *Com.* p. 2) has Logica appropriata seu particularis, and Logica communis = Universal, Abstract Logic. |
| V. Logica, | Abstracta.<br>Concreta. | |
| VI. Logica, | Pars Communis.<br>Pars Propria, — Apodictica.<br>Dialectica.<br>Sophistica. | v. Timpler, *Syst. Log*, p. 42. Isendoorn, *Effata*, Cent i. Eff. 56. |
| VII. Logica, | Εὑρετική vel τοπική.<br>Inventio.<br>Κριτική.<br>Judicium.<br>Dispositio. | v. Timpler, *Sys. Log.*, p. 44. Crellius, *Isagoge*, pp. 10, 11, and Isendoorn, *Effata*, Cent. i. Eff. 51. Adopted by Agricola, *De Inv. Dial.*, L. i. p. 35. Melanchthon, *Erot. Dial.*, p. 10. Ramus, *Schol. Dialect.* L. i. c. i., and L. ii. c. i. p. 351 *et seq.* Spencer, *Log.*, p. 11. Downam, *In Rami Dial.*, L. i. c. 2, p 14. Perionius, *De Dialectica*, L. i. p 6 (1544). Vossius, *De Nat. Artium sive Logica*, L. iv. c. ix. p. 217. |
| VIII. Logica, | Pars de Propositio.<br>Pars de Judicio. | v. Timpler, *Syst. Log.*, p. 49. |
| IX. Logica, | Doctrina Dividendi.<br>Doctrina Definiendi.<br>Doctrina Argumentandi. | v. Timpler, *Syst. Log.*, p. 51. Isendoorn, *Effata*, Cent. i. Eff. 57. Boethius, (Augustin, Fonseca, etc.) |

X. LOGICA,
- Simplicis Apprehensionis.
- Judicii.
- Ratiocinationis.
- Noëtica (*melius* Noematica).
- Synthetica.
- Dianoetica.

v. Timpler, *Syst. Log.*, 52 Isendoorn, *Effata*, Cent. i. Eff. 58. Isendoorn, *Cursus Logicus*, p. 31, and *Effata*, Cent. i. § 59 Noldius, *Log Rec.*, p. 9. Aquinas.

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XI. LOGICA,
- 1. Ideas (notions).
- 2. Judgment
- 3. Reasoning.
- 4. Method.

*L' Art de Penser*, Part i. Clericus, *Logica*, adopts this division, but makes Method third, Reasoning fourth.

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XII. LOGICA,
- 1. Doctrine of Elements.
- 2. Doctrine of Method.

Kant, *Logik*; Krug, *Logik*.

1st. Called Analytic by Metz, *Instit. Log* Twesten, *Die Logik, insbesondere die Analytik*, p. lii Esser, *Logik* Part i.

2d. Called Systematic or Architectonic by Bachmann, *Logik*, Part ii.

Called Synthetic by Esser (who includes under it also Applied Logic), *Logik*, Part ii.

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XIII. LOGICÆ partes,
- Thematica — de materia operationi Logicæ subjecta.
- Organica — de instrumentis sciendi.

Mark Duncan, *Institutiones Logicæ*, Proleg. c. iii. § 2, p. 22. Burgersdicius, *Instit. Log.*, L. i c. i. p. 5.

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XIV LOGICA,
- Communis, Generalis.
  - 1. De ordinibus rerum generalibus et attributis communissimis.
  - 2. De Vocibus et Oratione.
  - 3. De Ideis simplicibus et apprehensione simplici dirigenda.
  - 4. De Judicio et Propositione.
  - 5. De Discursu
  - 6. De Dispositione seu Methodo.
- Specialis.
  - Genesis seu Inventio.
    - Genesis stricta.
    - Genesis didactica.
  - Analysis.
    - Hermeneutica.
    - Analytica and Critica.
- Genetica.
  - In ordine ad mentem — Logica stricte dicta.
  - In ordine ad alios — Interpretativa vel Hermeneutica genetica.
- Analytica.
  - Hermeneutica analytica.
  - Analytica stricta vel in specie.

Theophilus Gale (*Logica*, 1681) follows (besides Keckermann and Burgersdyk) principally Clauberg and *L'Art de Penser* of Port Royal.

XV. LOGICA,
- Theoretica pars.
- Practica pars — (this including the Methodology and Applied Logic of Kant.,

Wolf, *Philos. Rationalis*, Pars i. and ii

XVI.
On Adrastean order, etc. of the books of the Organon, *vide* Ramus, *Scholæ Dial.*, L. ii., c. 8., p. 354. Piccartus, *In Organum*, Prolegomena, p. 1 *et seq.*

XVI.* LOGICÆ, partes,
1. Περὶ τῆς πρώτης ἐννοίας, or προλήψεως.
2. Περὶ σκέψεως.
3. Περὶ κρίσεως.
4. Περὶ διανοίας.
5. Περὶ μεθόδου.

Eugenius Diaconus, Λογικὴ, p. 144

XVII. LOGICA,
1. Emendatrice.
2. Inventrice.
3. Giudicatrice.
4. Ragionatrice.
5. Ordinatrice.

Genovesi. A division different in some respects is given in his Latin Logic, Proleg. § 51, p. 22. The fourth part of the division in the Latin Logic is omitted in the Italian, or rather reduced to the second; and the fifth divided into two.

XVIII. LOGICA,
- Vetus.
  - *Porphyrii Isag.* . . .
  - *Praed.* . . . . . . . .
  - *Interpret* . . . . .
- Nova.
  - *Analyt. Pr.* . . . . . .
  - *Analyt. Post.* . . . . .
  - *Top.* . . . . . . . . .
  - *Elench.* . . . . . . . .

Isendoorn, *Effata*, Cent. 1 Eff. 52.

Reason of terms, Pacius, *Comment in Org.*, *In Porph. Isag* p. 3.

XIX. LOGICA,
- Στοχειολογική.
- Συλλογιστική.
  - Apodictica.
  - Topica.
  - Sophistica.

Isendoorn, *Effata*, Cent. i Eff. 56. (From John Hospinian, *De Controversiis Dialecticis.*)

XX LOGICA,
- Στοιχειολογική.
- Συλλογιστική.
  - Analytica.
    - Prior.
    - Posterior.
  - Dialectica.
    - Topica.
    - Sophistica.

Vossius, *De Natura Artium sive de Logica*, L. iv. c. ix. p. 220.

| | | | |
|---|---|---|---|
| XXI. Logica, | Analytica. | prodromus de Interpretatione.<br>universe de Syllogismo.<br>speciatem de Demonstratione. | Vossius, *De Natura Artium*, p. 220. |
| | Dialectica. | prodromus de Categoriis.<br>de Syll. verisimili.<br>de Syll. sophistico sive pirastico. | |
| XXII. Logica, | Dialectica.<br>Analytica. | | Aristotle, in Laertius v. Vossius, *De Nat. Art. sive De Logica*, L. iv. c. ix. § 11, p. 219. |
| XXIII. Logica de | Rebus quæ significantur.<br>Vocibus quæ significant. | | Stoicorum, see Vossius, *De Nat. Art. sive De Logica*, L. iv. c. ix. § 7, p. 218. |
| XXIV. Logicæ partes de | Loquendo.<br>Eloquendo.<br>Proloquendo.<br>Proloquiorum summa. | | Varro, vide Vossius, *De Nat. Art.*, L. iv. c. ix. § 8, p. 219. |
| XXV. Logica, | Πρὸς εὕρεσιν.<br>Πρὸς κρίσιν.<br>Πρὸς χρῆσιν. | | Aristotle (?) in Laertius, L. v. § 28, p. 284. Alexander Aphrod. in nota Aldobrandini. |
| Logica, | Νοητική, Apprehensiva.<br>Κρίσιμος vel Κριτική, Judicativa.<br>Διαλεκτική, Argumentativa. | | Caramuel Lobkowitz, *Rationalis et Realis Philosophia, Logica seu Phil. Rat.* Disp. ii. p. 3. |
| Logicæ partes, | Divisio.<br>Definitio.<br>Argumentatio. | | v. Crellius, *Isagoge*, Pars. prior, c. i. p. 10. |
| Logicæ partes, | Apodictica.<br>Dialectica.<br>Sophistica. | | v. Crellius, *Isagoge*, Pars. prior, c. i. p. 10.<br>Isendoorn, *Effata*, Cent. i. Eff. 54. |
| Logicæ partes, | Analytica.<br>Topica. | | Crellius, *Isagoge*, Pars. prior, c. i. p. 10. |

Stoicheiology (pure) should contain the doctrine of Syllogism, without distinction of Deduction or Induction. Deduction, Induction, Definition, Division, from the laws of thought, should come under pure Methodology. All are processes (v. Cæsalpinus, *Quæst. Perip. sub init.*)

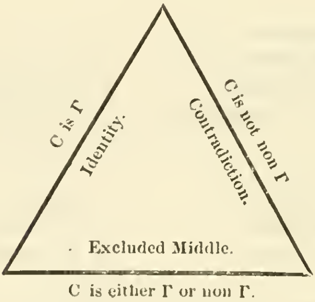
Perhaps, 1°, Formal Logic (from the laws of thought proper) should be distinguished from, 2°, Abstract Logic (material, but of abstract general matter); and then, 3°, A Psychological Logic might be added as a third part, considering how Reasoning, etc., is affected by the constitution of our minds. Applied Logic is properly the several sciences.

Or may not Induction and Deduction come under abstract Material Logic?

# IV.

## LAWS OF THOUGHT.

(See p. 60.)



The laws of Identity and Contradiction, each infers the other, but only through the principle of Excluded Middle; and the principle of Excluded Middle only exists through the supposition of the two others. Thus, the principles of Identity and Contradiction cannot move, — cannot be applied, except through supposing the principle of Excluded Middle; and this last cannot be conceived existent, except through the supposition of the two former. They are thus coordinate but inseparable. Begin with any one, the other two follow as corollaries.

### I. — Primary Laws of Thought, — in general.

See the following authors on: — Dreier, *Disput. ad Philosophiam Primam*, Disp. v. Aristotle, *Analyt. Post.* i. c. 11, §§ 2, 3, 4, 5, 6, 7. Schramm, *Philosophia Aristotelica*, p. 36. Lippius, *Metaphysica Magna*, L. i. c. i., p. 71 *et seq.* Stahl, *Regulæ Philosophicæ*, Tit. i., reg. i. p. 2 *et seq.*, reg. ii. p. 8 *et seq.*, Tit. xix reg. viii., p. 520 *et seq.* Chauvin, *Lexicon Philosophicum, v. Metaphysica.* Bisterfeld evolves all out of *ens, — ens est.* See *Philosophia Prima*, c. ii. p. 24 *et seq.* Bobrik, *System der Logik*, § 70, p. 247 *et seq.*

Laws of Thought are of two kinds: — 1°. The laws of the Thinkable, — Identity, Contradiction, etc. 2°. The laws of Thinking in a strict sense — viz. laws of Conception, Judgment, and Reasoning. See Scheidler, *Psychologie*, p. 15, ed. 1833.

That they belong to Logic: — Ramus, *Schol. Dial.*, L. ix., p. 549.

Is Affirmation or Negation prior in order of thought? and thus on order and mutual relation of the Laws among themselves, as coördinate or derived; (see separate Laws). Fracastorius, *Opera*, *De Intellectione*, L. i. f. 125 b., makes negation an act prior to affirmation; therefore, principle of Contradiction prior to principle of Identity. — Esser, *Logik*, § 28, p. 57. Sigwart, *Handbuch zu Vorlesungen über die Logik*, § 38 *et seq.* Piccolomineus, *De Mente Humana*, L. iii., c. 4. p. 1301, on question — Is affirmative or negative prior? Schulz, *Prüf. der Kant. Krit. der reinen Vernunft*, I. p. 78, 2d ed. Weiss, *Lehrbuch der Logik*, § 81 *et seq.* pp. 61, 62, 1805. Castillon, *Memoires de l'Académie de Berlin* (1803) p. 8 (Contradiction and Identity coördinate). A. Andreas, *In Arist. Metaph.* iv. Qu. 5. p. 21. (Affirmative prior to negative.) Leibnitz, *Œuvres Philosophiques*, *Nouv. Essais*, L. iv. ch. 2, § 1, p. 327, ed. Raspe. (Identity prior to Contradiction.) Wolf, *Ontologia*, §§ 55, 288 — (Contradiction first, Identity second). Derodon, *Metaphysica*, c. iii., p. 75 *et seq.* 1669. (Contradiction first, Excluded Middle second, Identity third). Fonseca, *In Metaph.*, I. 849. Biunde, *Psychologie*, Vol. I., part ii., § 151, p. 159. (That principle of Contradiction and principle of Reason and Consequent not identical, as Wolf and Reimarus hold.) Nic. Taurellus, *Philosophiæ Triumphus*, etc., p. 124. Arnheim, 1617. "Cum simplex aliqua sit affirmatio, negatio non item, hanc illam sequi concludimus," etc. Chauvin, *Lexicon Philosophicum*, *v. Metaphysica.*

By whom introduced into Logic: — Eberstein (*Über die Beschaffenheit der Logik und Metaphysik der reinen Peripatetiker*, p. 21, Halle, 1800) says that Darjes, in 1737, was the first to introduce Principle of Contradiction into Logic. That Buffier, and not Reimarus, first introduced principle of Identity into Logic, see Bobrik, *Logik*, § 70, p. 249.

## II. — PRIMARY LAWS OF THOUGHT, — IN PARTICULAR.

1. Principle of Identity. "Omne ens est ens." Held good by Antonius Andreas, *In Metaph.* iv., qu. 5. (apud Fonsecam, *In Metaph.* I. p. 849; melius apud Suarez, *Select. Disp. Metaph.* Disp. iii. sect. iii. n. 4.) Derodon, *Metaphysica*, c. iii., p. 77. J. Sergeant, *Method to Science*, pp. 133—136 and after. (Splits it absurdly.) Boethius — "Nulla propositio est verior illa in qua idem prædicatur de seipso." (Versor, *In P. Hispani Summulas Logicales*, Tr. vii., p. 441 (1st ed. 1487); et Buridanus, *In Sophism.*) "Propositiones illas oportet esse notissimas per se in quibus idem de se ipso prædicatur, ut 'Homo est homo,' vel quarum prædicata in definitionibus subjectarum includuntur, ut 'Homo est animal.'" Aquinas, *Contra Gentiles*, L. i. c. 10. *Opera* T. XVIII. p. 7, Venet. 1786. Prior to principle of Contradiction — Leibnitz, *Nouveaux Essais*, p. 377. Buffier, *Principes du Raissonnement*, II. art. 21, p. 204. Rejected

as identical and nugatory by Fonseca, *loc. cit.* Suarez, *loc. cit.* Wolf, *Ontologia*, §§ 55, 288, calls it Principium Certitudinis, and derives it from Principium Contradictionis.

2. Principle of Contradiction — ἀξίωμα τῆς ἀντιφάσεως.

Aristotle, *Metaph.*, L. iii. 3; x. 5. (Fonseca, *In Metaph.* T. I., p. 850, L. iv. (iii.) c. iii.) *Anal. Post.* L. i. c. 11 c. 2, § 13. (On Aristotle and Plato, see Mansel's *Prolegomena*, pp. 236, 237.) Stahl, *Regulæ Philosophicæ*, Tit. i. reg. i Suarez, *Select Disp. Phil.*, Disp. iii. § 3. Timpler, *Metaph.* L. i., c. 8 qu. 14. Derodon, *Metaphysica*, p. 75 etc. Lippius, *Metaphysica*, L. i. c. i., p. 73. Bernardi, *Thes. Aristot.*, *vv. Principium, Contradictio.* Leibnitz, *Œuvres Philosophiques*, *Nouv. Ess.*, L. iv. c. 2. Ramus, "Axioma Contradictionis," *Scholæ Dial.* L. ix. c. i., L. iv. c. 2. § 1, p 548. Gul. Xylander, *Institutiones Aphoristicæ Logices Aristot.*, p. 24 (1577), "Principium principiorum hoc. est, lex Contradictionis." Philoponus, ἀξίωμα τῆς ἀντιφάσεως, *v. In Post. An.* f. 30 b. *et seq.* Ammonius, ἀξίωμα τῆς ἀντιφάσεως, *In De Interpret.* f. 94, Ald. 1503; but principium Exclusi Medii, Scheibler, *Topica*, c. 19. On Definition of Contradictories, v. Scheibler, *Ibid.* On Two Principles of Contradiction, — Negative and Positive, *v.* Zabarella, *Opera Logica*, *In An. Post.* i. t. 83, p. 807.

Conditions of. — Aristotle, *Metaph.*, L. iv., c. 6. Bernardi, *Thesaurus Arist.*, v. *Contrad.*, p. 300.

Proof attempted by — Clauberg, *Ontosophia*, § 26 (Degerando, *Histoire de Philosophie*, T. II. p. 57), through Excluded Middle.

3. Principle of Excluded Middle — ἀξίωμα διαιρετικόν.

"'Αξίωμα διαιρετικόν, divisivum, dicitur a Græcis *principium contradictionis affirmativum*; 'Oportet de omni re affirmare aut negare,'" Goclenius, *Lexicon Philosophicum.* Lat. p. 136. Zabarella, *In An. Post.*, L. i., text 83, *Opera Logica.* p. 807. Conimbricenses, *In Org.*, II. 125. Lucian, *Opera*, II. p. 44 (ed. Hemsterhuis). Aristotle, *Metaph.*, L. iv. (iii.) c. 7; *An. Post.*, L. i. 2; ii. 13 (Mansel's *Prolegomena*, p. 236). Joannes Philoponus (v. Bernardi, *Thes. v. Contrad.*, p. 300). Piccartus, *Isagoge*, pp. 290, 291. Javellus, *In Metaph.*, L. iv. qu. 9. Suarez, *Disp. Metaph.*, Disp. iii., sect. 3, § 5. Stahl, *Regulæ Philos.*, Tit. i. reg. 2. Wolf, *Ontologia*, §§ 27, 29, 56, 71, 498. Fonseca, *In Metaph.*, L. iv. c. iii. qu. 1. *et seq.*, T. I. p. 850. (This principle not first.) Timpler, *Metaphysica*, L. ii. c. 8, qu. 15. Derodon, *Metaph.*, p. 76. (Secundum principium.) Lippius, *Metaphysica*, L. i. c. i., pp. 72, 75. Chauvin, *Lexicon Philosophicum*, *v. Metaphysica.* Scheibler, *Topica*, c. 19. Hurtado de Mendoza, *Disp. Metaph.*, Disp. iii., § 3 (Caramuel, *Rat. et Real. Phil.*, § 452, p. 68).

Whether identical with Principle of Contradiction.

Affirmative, — Javellus, *l. c.* Mendoza, *Disp. Metaph.*, D. iii. § 3. Leibnitz, *Œuvres Philosophiques*, *Nouv. Ess.*, L. iv. c. 2, p. 327.

Negative, — Fonseca, *Disp. Met.* Disp. iv. c. 3, 9. Suarez, *Disp. Metaph.*, Disp. iii. § 3. Stahl, *Reg. Phil.* Tit. i. reg. 2.

Whether a valid and legitimate Law.

Fischer, *Logik*, § 64 *et seq.* (Negative). — Made first of all principles by Alexander de Ales, *Metaph.*, xiv. text 9: "Conceptus omnes simplices, ut resolvuntur ad ens, ita omnes conceptus compositi resolvuntur ad hoc principium — *De quolibet affirmatio vel negatio.*" J. Picus Mirandulanus (after Aristotle), *Conclusiones*, *Opera*, p. 90. Philoponus, *In An. Post.* i. f. 9 b, (Brandis, *Scholia*, p. 199). Τὸ δ' ἅπαν φάναι ἢ ἀποφάναι, ἡ εἰς τὸ ἀδύνατον ἀπόδειξις λαμβάνει. Aristotle, *An. Post.* i. c. 11. § 3. Ἀντίφασις δὲ ἀντίθεσις ἧς οὐκ ἔστι μεταξὺ καθ' αὑτήν. *An. Post.* i. c. 2, § 13. Μεταξὺ ἀντιφάσεως οὐκ ἐνδέχεται οὐθέν. *Metaph.* L. iii. c. 7. Ἐπεὶ ἀντιφασεας οὐδὲν ἀνὰ μέσον, φανερὸν ὅτι ἐν τοῖς ἐναντίοις ἔσται τὸ μεταξύ. *Physica*, L. v. c. 3, § 5. See also *Post. An.* L. i. c. i. § 4, p 414, c. 2 § 13, p. 417; c. 11, § 3, p. 440 (vide Scheibler, *Topica*, c. 19; and Mansel's *Prolegomena*, p. 236, on Aristotle).

4. Principle of Reason and Consequent.

That can be deduced from Principle of Contradiction.

Wolf, *Ontologia*, § 70. Baumgarten, *Metaphysik*, § 18.

Jakob, *Grundriss der allgemeinen Logik und Kritische Angfangsgründe der allgemeinen Metaphysik*, p. 38, 3d ed., 1794. (See Kiesewetter, *l. c.*)

That not to be deduced from Principle of Contradiction.

Kiesewetter, *Allgemeine Logik; Weitere Auseinandersetzung*, P. I. *ad* §§ 20, 21, p. 57 *et seq.* Hume, *On Human Nature*, Book i. part iii. § 8. Schulze, *Logik*, § 18, 5th ed., 1831.

# V.

## NEW ANALYTIC OF LOGICAL FORMS — GENERAL RESULTS — FRAGMENTS.

### I. — Extract from Prospectus of "Essay towards a New Analytic of Logical Forms."

(First published in 1846 [1] See pp 102, 172. — Ed.)

> "*Now, what has been the source of all these evils, I proceed to relate, and shall clearly convince those who have an intellect and a will to attend, — that a trivial slip in the elementary precepts of a Logical Theory becomes the cause of mightiest errors in that Theory itself.*" — Galen. (*De Temperamentis*, l. i. c. 5.)

"This New Analytic is intended to complete and simplify the old; — to place the keystone in the Aristotelic arch. Of Abstract Logic, the theory, in particular of Syllogism (bating some improvements, and some errors of detail), remains where it was left by the genius of the Stagirite; if it have not receded, still less has it advanced. It contains the truth; but the truth, partially, and not always correctly, developed, — in complexity, — even in confusion. And why? Because Aristotle, by an oversight, marvellous certainly in him, was prematurely arrested in his analysis; began his synthesis before he had fully sifted the elements to be recomposed; and, thus, the system which, almost spontaneously, would have evolved itself into unity and order, he laboriously, and yet imperfectly, constructed by sheer intellectual force, under a load of limitations and corrections and rules, which, deforming the symmetry, has seriously impeded the usefulness, of the science. This imperfection, as I said, it is the purpose of the New Analytic to supply.

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[1] An extract, corresponding in part with that now given from the Prospectus of "Essay towards a New Analytic of Logical Forms," is republished in the *Discussions on Philosophy*, p. 650. To this extract the Author has prefixed the following notice regarding the date

"In the first place, in the Essay there will be shown, that the Syllogism proceeds, not as has hitherto, virtually at least, been taught, in one, but in the *two* correlative and counter *wholes* (Metaphysical) of *Comprehension*, and (Logical) of *Extension*; the major premise in the one whole being the minor premise in the other, etc. — Thus is relieved a radical defect and vital inconsistency in the present logical system.

"In the second place, the self-evident truth, — That we can only rationally deal with what we already understand, determines the simple logical postulate, — *To state explicitly what is thought implicitly.* From the consistent application of this postulate, on which Logic ever insists, but which Logicians have never fairly obeyed, it follows: — that, logically, we ought to take into account the *quantity*, always understood in thought, but usually, and for manifest reasons, elided in its expression, not only of the *subject*, but also of the *predicate*, of a judgment. This being done, and the necessity of doing it will be proved against Aristotle and his repeaters, we obtain, *inter alia*, the ensuing results:

"1°. That the *preindesignate terms* of a proposition, whether subject or predicate, are never, on that account, thought as *indefinite* (or indeterminate) in quantity. The only indefinite, is *particular*, as opposed to *definite*, quantity; and this last, as it is either of an extensive *maximum* undivided, or of an extensive *minimum* indivisible, constitutes quantity *universal* (general), and quantity *singular* (individual). In fact, *definite* and *indefinite* are the only quantities of which we ought to hear in Logic; for it is only as indefinite that particular, it is only as definite that individual and general, quantities have any (and the same) logical avail.

"2°. The revocation of the *two Terms of a proposition* to their *true relation*; a proposition being always an *equation* of its subject and its predicate.

"3°. The consequent reduction of the *Conversion of Propositions* from three species to *one*, — that of Simple Conversion.

"4°. The reduction of all the *General Laws of Categorical Syllogisms* to a *Single Canon*.

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of his doctrine of the Quantification of the Predicate: — "Touching the principle of an explicitly *Quantified Predicate*, I had, by 1833, become convinced of the necessity to extend and correct the logical doctrine upon this point. In the article on Logic (in the *Edinburgh Review*) first published in 1833, the theory of Induction there maintained proceeds on a thorough quantification of the predicate, in affirmative propositions.

"Before 1840, I had, however, become convinced that it was necessary to extend the principle equally to negatives; for I find, by academical documents, that in that year, at latest, I had publicly taught the unexclusive doctrine." — *Discussions*, p. 650. — ED.

"5°. The evolution from that *one canon* of all the *Species and varieties of Syllogism.*

"6°. The *abrogation* of all the *Special Laws of Syllogism.*

"7°. A demonstration of the *exclusive possibility of Three syllogistic Figures*, and (on new grounds) the scientific and final *abolition of the Fourth.*

"8°. A manifestation that *Figure* is an *unessential variation* in syllogistic form; and the consequent *absurdity of Reducing* the syllogisms of the other figures to the first.

"9°. An enouncement of *one Organic Principle* for *each Figure.*

"10°. A determination of the true *number* of the legitimate *Moods;* with

"11°. Their *amplification* in number *(thirty-six);*

"12°. Their numerical *equality* under all the figures; and,

"13°. Their *relative equivalence*, or virtual identity, throughout every schematic difference.

"14°. That, in the *second* and *third* figures, the extremes holding both the same relation to the middle term, there *is not*, as in the first, *an opposition and subordination between a term major and a term minor, mutually containing* and *contained, in the counter wholes of Extension and Comprehension.*

"15°. Consequently, in the *second* and *third* figures, there is *no determinate major and minor premise*, and there are *two indifferent conclusions;* whereas, in the *first* the *premises* are *determinate*, and there is a *single proximate conclusion.*

"16°. That the *third*, as the figure in which *Comprehension* is predominant, is more appropriate to *Induction.*

"17°. That the *second*, as the figure in which *Extension* is predominant, is more appropriate to *Deduction.*

"18°. That the *first*, as the figure in which *Comprehension* and *Extension* are in *equilibrium*, is common to *Induction* and *Deduction*, indifferently.

"In the *third* place, a scheme of Symbolical Notation will be given, wholly different in principle and perfection from those which have been previously proposed; and showing out, in all their old and new applications, the propositional and syllogistic forms, with even a mechanical simplicity.

"This Essay falls naturally into two parts. There will be contained, — in the *first*, a systematic exposition of the new doctrine itself; in the *second*, an historical notice of any occasional anticipations of its several parts which break out in the writings of previous philosophers.

"Thus, on the new theory, many valid *forms* of judgment and reasoning, in ordinary use, but which the ancient logic continued to ignore, are now openly recognized as legitimate; and many *relations*, which heretofore lay hid, now come forward into the light. On the one hand, therefore, Logic certainly becomes more complex. But, on the other, this increased complexity proves only to be a higher development. The developed Syllogism is, in effect, recalled, from multitude and confusion, to order and system. Its laws, erewhile many, are now few, — we might say one alone, — but thoroughgoing. The exceptions, formerly so perplexing, have fallen away; and the once formidable array of limitary rules has vanished. The science now shines out in the true character of beauty, — *as One at once and Various.* Logic thus accomplishes its final destination; for as 'Thrice-greatest Hermes,' speaking in the mind of Plato, has expressed it, — '*The end of Philosophy is the intuition of Unity.*'"

## II. — Logic, — Its Postulates.

(November 1848 — See p. 81.)

I. To state explicitly what is thought implicitly. In other words, to determine what is meant before proceeding to deal with the meaning. Thus in the proposition *Men are animals*, we should be allowed to determine whether the term *men* means *all* or *some men*, — whether the term *animals* means *all* or *some animals*; in short, to quantify both the subject and predicate of the proposition. This postulate applies both to Propositions and to Syllogisms.[1]

II. Throughout the same Proposition, or Immediate (not mediate) Reasoning, to use the same words, and combinations of words, to express the same thought[2] (that is, in the same Extension and Comprehension), and thus identity to be presumed.

Thus a particular in one (prejacent) proposition of an immediate reasoning, though indefinite, should denote the *same part* in the other. This postulate applies to inference immediate, *e. g.* Conversion.

Predesignate in same logical unity (proposition or syllogism), in same sense, both Collective or both Distributive. That one term of a proposition or syllogism should not be used distributively and another collectively.

III. And, *e contra*, throughout the same logical unity (immediate reasoning), to denote and presume denoted the same sense (notion or judgment) by the same term or terms.[3]

This does not apply to the different propositions of a Mediate Inference.

IV. (or V.) To leave, if necessary, the thought undetermined, as subjectively uncertain, but to deal with it only as far as certain or determinable. Thus a whole may be truly predicable, though we know only the truth of it as a part. Therefore, we ought to be able to say *some at least* when we do not know, and cannot, therefore, say determinately, either that *some only* or that *all* is true.

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[1] See (quoted by Wallis, *Logica*, p. 291), Aristotle, *An. Prior.*, L. i., c. 33 (Pacius, c. 32, §§ 2, 3, 4, p. 261), and Ramus (from Downam, *In P. Rami Dialect.*, L. ii., c. 9, p. 410): What is understood to be supplied; [*Ramus Dial.*, L. ii., c. 9. "Si qua [de argumentationis consequentia propter crypsin] dubitatio fuerit, explenda quæ desunt; amputanda quæ supersunt; et pars quælibet in locum redigenda situ est." [Cf. Ploucquet, *Elementa Philosophiæ Contemplativæ*, § 24, p. 5. Stutgardiæ, 1778. "Secundum sensum logicum cum omni termino jungendum est signum quantitatis." — Ed.]

[2] That words must be used in the same sense. See Aristotle, *Anal. Prior.*, L. i., cc. 33, 34, 35, 36, 37, etc.

[3] If these postulates (II. and III.) were not cogent, we could not convert, at least not use the converted proposition (unless the I. were cogent, the *convertenda* would be false). *All man is* (*an*) *animal*, is converted into *Some animal is* (*all*) *man*. But if the *some animal* here were not thought in and limited to the sense of the convertend, it would be false. So in the hypothetical proposition, *If the Chinese are Mohammedans, they are* (*some*) *infidels*; the word *infidel*, unless thought in a meaning limited to and true of *Mohammedans*, is inept. But if it be so limited, we can (contrary to the doctrines of the logicians) argue back from the position of the consequent to the position of the antecedent, and from the sublation of the antecedent to the sublation of the consequent, though false. If not granted, Logic is a mere childish play with the vagueness and ambiguities of language. [Cf. Titius, *Ars Cogitandi*, c. xii., § 26. — Ed.]

(January 1850.)

III. (or IV.) To be allowed, in an immediate reasoning, to denote, that *another* part, *other*, or *some*, is used in the conclusion, from what was in the antecedent. Inference of *Sub-contrariety*.

That the *some*, if not otherwise qualified, means *some only*, — this by presumption.

That the Term (Subject, or Predicate) of a Proposition shall be converted with its quantity unchanged, *i. e.* in the same extension. This violated, and violation cause of error and confusion. No *per accidens*, for the real terms compared are the *quantified* terms, and we convert only the terms compared in the prejacent or convertenda.

That the same terms, apart from the quantity, *i. e*, in the same comprehension, should be converted. As before stated, such terms are new and different. No Contraposition, for contraposition is only true in some cases, and even in these it is true accidentally, not by conversion, but through contradiction ; *i. e.*, same Comprehension.

That we may see the truth from the necessary validity of the logical process, and not infer the validity of the logical process from its accidental truth. Conversion *per accidens*, and Contraposition, being thus accidentally true in some cases only, are logically inept as not true in all.

To translate out of the complexity, redundance, deficiency, of common language into logical simplicity, precision, and integrity.[1]

(December 1849.)

As Logic considers the form and not the matter, but as the form is only manifested in application to some matter, Logic postulates to employ any matter in its examples.

(January 1850.)

That we may be allowed to translate into logical language the rhetorical expressions of ordinary speech. Thus the Exceptive and Limitative propositions in which the predicate and subject are predesignated, are to be rendered into logical simplicity.

(May 1850.)

As Logic is a formal science, and professes to demonstrate by abstract formulæ, we should know, therefore, nothing of the notions and their relations except *ex facie* of the propositions. This implies the necessity of overtly quantifying the predicate.

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[1] See p. 512, note 1. — Ed.

## III. — QUANTIFICATION OF PREDICATE, — IMMEDIATE INFERENCE, — CONVERSION, — OPPOSITION.[1]

(See pp. 172, 185.)

We now proceed to what has been usually treated under the relation of Propositions, and previously to the matter of Inference altogether, but which I think it would be more correct to consider as a species of Inference, or Reasoning, or Argumentation, than as merely a preparatory doctrine. For in so far as these relations of Propositions warrant us, one being given, to educe from it another, — this is manifestly an inference or reasoning. Why it has not always been considered in this light is evident. The inference is immediate; that is, the conclusion or second proposition is necessitated, directly and without a medium, by the first. There are only two propositions and two notions in this species of argumentation; and the logicians have in general limited *reasoning* or *inference* to a mediate eduction of one proposition out of the correlation of two others, and have thus always supposed the necessity of three terms or collated notions.

But they have not only been, with few exceptions, unsystematic in their procedure, they have all of them (if I am not myself mistaken) been fundamentally erroneous in their relative doctrine.

There are various Immediate Inferences of one proposition from another. Of these some have been wholly overlooked by the logicians; whilst what they teach in regard to those which they do consider, appears to me at variance with the truth.

I shall make no previous enumeration of all the possible species of Immediate Inference; but shall take them up in this order: I shall consider, 1°, Those which have been considered by the logicians; and, 2°, Those which have not. And in treating of the first group, I shall preface what I think the true doctrine by a view of that which you will find in logical books.

The first of these is *Conversion*. When, in a categorical proposition (for to this we now limit our consideration), the Subject and Predicate are transposed, that is, the notion which was previously the subject becomes the predicate, and the notion which was previously the predicate becomes the subject, the proposition is said to be converted.[2] The proposition given, and its product, are together called the *judicia conversa*, or *propositiones conversæ*, which I shall not attempt to render into English. The relation itself in which the two judgments stand, is called *conversion*, *reciprocation*, *transposition*, and sometimes *obversion*, (*conversio*, *reciprocatio*, *transpositio*, *obversio*).

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[1] Appendix III., from p. 514 to p. 527, was usually delivered by the author as a Lecture, supplementary to the doctrine of Conversion as given p. 185. — ED.

[2] Definitions of conversion in general. Ἀντιστροφή ἐστιν ἰσοστροφή τις, Philoponus (or Ammonius). *In An. Pr.* i. c 2, f. 11 b. So Magentinus. *In An Pr* i. c 2. f. 3 b Anonymus, *De Syllogismo*, f. 42 b Προτάσεω, ἀντιστροφὴ ἔστι κοινωνία δύο προτασέων κατὰ τοὺς ὅρους ἀνάπαλιν τιθεμένους, μετὰ του συναληθεύειν. Alexander, *In An. Pr* i. c. 4, f 15 b. See the same in different words, by Philoponus (Ammonius), *In An. Pr* i c 2, f. 11 b., and copied from him by Magentinus, *In An. Pr.*, f 3 b. Cf. Boethius, *Opera*, *Introductio ad Syllogismos*, p. 574. Wegelin, in *Gregorii Anonymi Phil Syntag.* (circa 1260), L. v., c. 12, p. 621. Nicephorus Blemmidas, *Epit. Log.*, c. 31, p. 221.]

The original or given proposition is called the *Converse*, or *Converted*, sometimes the *Præjaceno*, *Judgment (judicium*, or *propositio*, *conversum*, *conversa. præjacens)* ; the other, that into which the first is converted, is called the *Converting*, and sometimes the *Subjacent*, *Judgment (propositio*, or *jud. convertens, subjacens)*. It would be better to call the former the *Convertend (pr. convertenda)*, the latter the *Converse (pr. conversa)*. This language I shall use.[1]

Such is the doctrine touching Conversion taught even to the present day. This in my view is beset with errors; but all these errors originate in two, as these two are either the cause or the occasion of every other.

The First cardinal error is, — That the quantities are not converted with the quantified terms. For the real terms compared in the Convertend, and which, of course, ought to reäppear without change, except of place, in the Converse, are not the naked, but the quantified terms. This is evident from the following considerations:

1°, The Terms of a Proposition are only terms as they are terms of relation; and the relation here is the relation of comparison.

2°, As the Propositional Terms are terms of comparison, so they are only compared as Quantities, — quantities relative to each other. An Affirmative Proposition is simply the declaration of an equation, a Negative Proposition is simply the declaration of a non-equation, of its terms. To change, therefore, the quantity of either, or of both Subject and Predicate, is to change their correlation, — the point of comparison; and to exchange their quantities, if different, would be to invert the terminal interdependence; that is, to make the less the greater, and the greater the less.

3°, The Quantity of the Proposition in Conversion remains always the same; that is, the absolute quantity of the Converse must be exactly equal to that of the Convertend. It was only from overlooking the quantity of the predicate

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[1] See p. 185. — Ed.

[Names for the two propositions in Conversion.

I. Name for the two correlative propositions — Conversa, Twesten, *Logik*, § 87, Contraposita, *Id. ibid.*

II. Original, or Given Proposition.

a) *ἡ προηγουμένη, τροκειμενη, ἀντιστρεφομένη πρότασις* — Cf. Strigelius *In Melanchth. Erot. Dial.*, L. ii, p. 581.

*'Αντιστρεφοὐσαι προτάσεις*, Philoponus, (quoted by Wegelin, *l. c*)

b) Conversa (= Convertenda) vulgo. Scotus, *Quæstiones in An Prior*, i q. 12. Corvinus, *Instit. Phil.*, § 510. Richter, *De Conversione*, 1740. Halæ Magdeb. Baumgarten, *Logica*, § 278. Ulrich, *Instit. Log. et Met.*, § 182, p. 188.

c) Convertibilis (raro).

d) Convertens, Micraelius, *Lex. Phil. v. Conversio.* Twesten, *Logik*, § 87. Antecedens, Scotus, *l. c.* Strigelius, *l. c.*

e) Præjacens. Scheibler, *Opera Logica De Propositionibus*, Pars iii. c. x. p. 479.

f) Exposita, Aldrich, *Comp.*, L. i. c. 2 Whately, *Logic*, p. 69 Propositio exposita or exponens, quite different as used by Logicians, v. Schegkius, *In Arist. Org.* 162 (and above, p. 186.)

g) Convertenda, Corvinus, *loc. cit.* Richter, *loc. cit.*

h) Contraponens, Twesten, *Ibid.*

i) Prior, Boethius, *De Syllog. Categ.* L. I. *Opera*, p. 588.

k) Principium, Darjes, *Via ad Veritatem*, § 234.

III Product of Conversion.

a) *ἡ ἀντιστρέφουσα.* See Strigelius, *loc. cit.*

b) Convertens, Subjacens, Scotus. *Quæstiones, In An. Prior.*, i. 9, 24, f. 276, *et passim.* Krug, *Logik*, § 65. p. 205, and logicians in general.

c) Conversa, Boethius, *Opera*, *Introd. ad Syll.*, pp 575 *et seq.*, 587 *et seq.*: Melanchthon, *Erotemata*, L ii p 581, and Strigelius, *ad loc.* Micraelius, *Lex. Phil.*, *v. Conversio.* Noldius, *Logica Recognita*, p. 263. says that the first should more probably be called Convertibilis, or Convertenda, and the second Conversa.

d) Conversum, Twesten, *loc. cit.*

e) Contrapositum, *Id. ibid.*

f) Conclusio, Darjes, *Via ad Veritatem*, § 234.

(the second error to which we shall immediately advert) that two propositions, exactly equal in quantity, in fact the same proposition, perhaps, transposed, were called the one *universal*, the other *particular*, by exclusive reference to the quantity of the subject.

4°. Yet was it of no consequence, in a logical point of view, which of the notions collated were Subject or Predicate; and their comparison, with the consequent declaration of their mutual inconclusion or exclusion, that is, of affirmation or negation, of no more real difference than the assertions, —*London is four hundred miles distant from Edinburgh*, —*Edinburgh is four hundred miles distant from London.* In fact, though logicians have been in use to place the subject first, the predicate last, in their examples of propositions, this is by no means the case in ordinary language, where, indeed, it is frequently even difficult to ascertain which is the determining and which the determined notion. Out of logical books, the predicate is found almost as frequently before as after the subject, and this in all languages. You recollect the first words of the *First Olympiad* of Pindar, "Ἄριστον μὲν ὕδωρ, " Best is water ;" and the Vulgate (I forget how it is rendered in our English translation) has, "Magna est veritas, et prævalebit."[1] Alluding to the Bible, let us turn up any Concordance under any adjective title, and we shall obtain abundant proof of the fact. As the adjective *great, magnus*, has last occurred, let us refer to Cruden under that simple title. Here, in glancing it over, I find — " Great is the wrath of the Lord — Great is the Lord and greatly to be praised — Great is our God — Great are thy works — Great is the Holy One of Israel — Great shall be the peace of thy children — Great is thy faithfulness — Great is Diana of the Ephesians — Great is my boldness — Great is my glorying — Great is the mystery of godliness," etc.

The line of Juvenal,

> " Nobilitas sola est atque unica virtus,"

is a good instance of the predicate being placed first.

The Second cardinal error of the logicians is, the not considering that the Predicate has always a quantity in thought, as much as the Subject; although this quantity be frequently not explicitly enounced, as unnecessary in the common employment of language; for the determining notion or predicate being always thought as at least adequate to, or coëxtensive with, the subject or determined notion, it is seldom necessary to express this, and language tends ever to elide what may safely be omitted. But this necessity recurs the moment that, by conversion, the predicate becomes the subject of the proposition; and to omit its formal statement is to degrade Logic from the science of the necessities of thought, to an idle subsidiary of the ambiguities of speech. An unbiassed consideration of the subject will, I am confident, convince you that this view is correct.

1°. That the predicate is as extensive as the subject is easily shown. Take the proposition, — *All animal is man*, or, *All animals are men.* This we are conscious is absurd, though we make the notion *man* or *men* as wide as possible; for it does not mend the matter to say, — *All animal is all man*, or, *All animals are all men.* We feel it to be equally absurd as if we said, — *All man is all animal*, or, *All men are all animals.* Here we are aware that the subject and predicate cannot be made coëxtensive. If we would get rid of the absurdity, we bring the two notions into coëxtension, by restricting the wider. If we say, — *Man is animal* (*Homo est animal*), we think, though we do not overtly enounce it, *All man is animal.* And what do we mean here by *animal?* We do not think, — *All*, but *Some*, *animal.* And then we can make this indifferently either subject or predicate. We can think, — we can say, *Some animal is man*, that is, *Some or All Man;* and, *e converso*, — *Man* (*some* or *all*) *is animal*, viz., *some animal.*

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[1] III. Esdras iv. 41: "Magna est veritas et prævalet." In the English version (I. Esdras iv. 41), "Great is truth, and mighty above all things." — Ed.

It thus appears that there is a necessity in all cases for thinking the predicate, at least, as extensive as the subject. Whether it be absolutely, that is, out of relation, more extensive, is generally of no consequence; and hence the common reticence of common language, which never expresses more than can be understood, — which always, in fact, for the sake of brevity, strains at ellipsis.

2°, But, in fact, ordinary language quantifies the Predicate so often as this determination becomes of the smallest import. This it does directly, by adding *all*, *some*, or their equivalent predesignations, to the predicate; or it accomplishes the same end indirectly, in an exceptive or limitative form.

a) Directly. — as *Peter, John, James*, etc., *are all the Apostles* — *Mercury, Venus*, etc., *are all the planets.*

b) But this is more frequently accomplished indirectly, by the equipollent forms of *Limitation* or *Inclusion*, and *Exception.*[1]

For example, by the limitative designations, *alone* or *only*, we say, — *God alone is good*, which is equivalent to saying, — *God is all good*, that is, *God is all that is good; Virtue is the only nobility*, that is, *Virtue is all noble*, that is, *all that is noble.*[2] The symbols of the Catholic and Protestant divisions of Chris-

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[1] By the logicians this is called simply *Exclusion*, and the particles, *tantum*, etc., *particulæ, exclusivæ.* This, I think, is inaccurate; for it is inclusion, limited by an exclusion, that is meant. — [See Scheibler, *Opera Logica*, P. iii. c. vii. tit 3, p. 457 *et seq.*]

[2] (February 1850.) On the Indirect Predesignation of the Predicate by what are called the *Exclusive* and *Exceptive particles.*

Names of the particles.

Latin, — *unus, unicus, unice; solus, solum, solummodo, tantum, tantummodo; duntaxat; præcise; adæquate. Nihil præter, — præterquam, — ni nisi non.*

English, — *one, only, alone, exclusively, precisely, just, sole, solely, nothing but, not except, not beyond.*

I. These particles annexed to the Subject predesignate the Predicate universally, or to its whole extent, denying its particularity or indefinitude, and definitely limiting it to the subject alone. As, *Man alone philosophizes* (though not all do). *The dog alone barks*, or, *dogs alone bark* (though some do not). *Man only is rational*, or, *No animal but man is rational. Nothing but rational is risible. Of material things there is nothing living* (*but*) *not organized, and nothing organized not living. God alone is to be worshipped. God is the single, — sole object of worship. Some men only are elect.*

II. Annexed to the Predicate, they limit the subject to the predicate, but do not define its quantity, or exclude from it other subjects. As, *Peter only plays. The sacraments are only two. John drinks only water.*

III. Sometimes the particles *sole, solely, single, alone, only*, etc., are annexed to the Predicate as a predesignation tantamount to *all.* As, *God is the single, — one, — alone, — only, — exclusive, — adequate, object of worship.*

On the relation of Exclusive propositions tianity may afford us a logical illustration of the point. The Catholics say,— *Faith, Hope, and Charity alone justify:* that is, *the three heavenly virtues together are all justifying*, that is, *all that justifies: omne justificans, justum faciens.* The Protestants say.— *Faith alone justifies:* that is, *Faith*, which they hold to comprise the other two virtues, *is all justifying*, that is, *all that justifies; omne justificans.* In either case, if we translate the watchwords into logical simplicity, the predicate appears predesignated.

*Of animals man alone is rational;* that is, *Man is all rational animal. What is rational is alone or only risible;* that is, *All rational is all risible*, etc.

I now pass on to the Exceptive Form. To take the motto overhead,— "On earth there is nothing great but man." What does this mean? It means, *Man — is — all earthly great. — Homo — est — omne magnum terrestre.* And the second clause — "In man there is nothing great but mind"— in like manner gives as its logical equipollent — *Mind — is — all humanly great*, that is, *all that is great in man. (Mens est omne magnum humanum.)*[1]

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to those in which the predicate is predesignated, see Titius, *Ars Cogitandi*, c. vi. §§ 66, 67. Hoffmann, *Philosophia Rationalis*, § 475. Kreil, *Handbuch der Logik*, § 62. Derodon, *Logica Restituta, De Enunciatione*, c. v. p. 569 *et seq.* Keckermann, *Systema Logicæ*, lib. iii., c. 11. *Opera*, t. i. p. 763.

The doctrine held by the logicians as to the *exclusum prædicatum, exclusum subjectum*, and *exclusum signum*, is erroneous. See Scheibler, *Opera Logica*, P. iii. c. vii. tit. 3, p. 457 *et seq.* Jac. Thomasius, *Erotem. Log.*, c. xxx. p. 67 *et seq.* [Cf. Fonseca, *Instit. Dial.*, L. III. c. 23. For a detailed exposition of this doctrine by Scheibler, see below, note 1. — ED.]

[1] Vide Scheibler, *Opera Logica*, P. iii. c. vii. pp. 458, 460, where his examples, with the exposition of the Logicians, may be well contrasted with mine.

[Scheibler, after referring to the *Parva Logicalia* of the schoolmen, as containing a proposed supplement of the doctrines of Aristotle, proceeds to expound the *Propositiones Exponibiles* of those treatises. "Exclusiva enunciatio est, quæ habet particulam exclusivam, ut, *Solus* homo est rationalis. . . . Porro exclusivæ enunciationes sunt duplicis generis. Aliæ sunt exclusivæ prædicati: aliæ exclusivæ subjecti; hoc est, in aliis particula exclusiva excludit a subjecto, in aliis excludit a prædicato, veluti hæc propositio exclusiva est, *Deus tantum est immortalis.* Estque exclusiva a subjecto, hoc sensu, Deus tantum, et non homo vel lapis, etc. . . . . Omnes propositiones exclusivæ ambiguæ sunt, si habeant particulam exclusivam, post subjectum propositionis, ante vinculum, ut erat in proposito exemplo. Carent autem propositiones exclusivæ illa ambiguitate, si vel exclusiva particula, ponatur ante subjectum propositionis, vel etiam sequatur copulam. Ibi enim indicatur esse propositio exclusiva subjecti, ut, *solus homo discurrit.* Hic autem indicatur, esse propositio exclusiva prædicati, ut, *Sacramenta Novi Testamenti sunt tantum duo. Prædicamenta tantum decem.*"

Scheibler then proceeds to give the following general and special rules of Exclusion:

"I. Generaliter tenendum est, *quod aliter sint exponendæ exclusivæ a prædicato, et aliter exclusivæ a subjecto.*

"II. *Exclusiva propositio non excludit concomitantia.*

"III. *Omnis exclusiva resolvitur in duas simplices, alteram affirmatam, alteram negatam.* Atque hoc est quod vulgo dicitur, quod omnis exclusiva sit hypothetica. Hypothetica enim propositio est quæ includit duas alias in virtute, vel dispositione sua. Veluti hæc, *Solus homo est rationalis*, æquivalet his duabus, *Homo est rationalis*, et *quod non est homo, non est rationale.* Et in specie, *Bestia non est rationalis. Planta non est rationalis.* . . . . Atque hæ duæ propositiones vocantur *exponentes*, sicut propositio exclusiva dicitur *exponibilis.*

"Speciales autem regulæ explicandi exclusivas sunt octo: sicut et octo sunt genera locutionum exclusivarum.

"I. *Propositio exclusiva universalis affirmativa, cujus signum non negatur*, ut, *Tantum omnis homo currit*, exponitur sic, *Omnis homo currit, et nihil aliud ab homine currit.* Vocari solet hæc expositio PATER, quia prior ejus pars est universalis affirmativa quod notat A. Et, altera pars est universalis negativa quod indicat in posteriori syllaba litera E.

"II. *Propositio particularis, vel indefinita affirmativa, in qua signum non negatur, ut Tantum homo currit*, exponitur sic, *Homo currit, et*

We ought, indeed, as a corollary of the postulate already stated, to require to be allowed to translate into equivalent logical terms the rhetorical enouncement of common speech. We should not do as the logicians have been wont, — introduce and deal with these in their grammatical integrity; for this would be to swell out and deform our science with mere grammatical accidents; and to such fortuitous accrescences the formidable volume, especially of the older Logics, is mainly owing. In fact, a large proportion of the scholastic system is merely grammatical.

3°, The whole doctrine of the non-quantification of the predicate is only another example of the passive sequacity of the logicians. They follow obediently in the footsteps of their great master. We owe this doctrine and its prevalence to the precept and authority of Aristotle. He prohibits once and again the annexation of the universal predesignation to the predicate. For why, he says, such predesignation would render the proposition absurd; giving as his only example and proof of all this, the judgment —*All man is all animal.* This, however, is only valid as a refutation of the ridiculous doctrine, held by no one, that any predicate may be universally quantified; for, to employ his own example, what absurdity is there in saying that *some animal is all man!* Yet this nonsense (be it spoken with all reverence of the Stagirite) has imposed the precept on the systems of Logic down to the present day. Nevertheless, it could be shown by a cloud of instances from the Aristotelic writings themselves, that this rule is invalid; nay, Aristotle's own doctrine of Induction, which is far more correct than that usually taught, proceeds upon the silent abolition of the erroneous canon. The doctrine of the logicians is, therefore, founded on a blunder; which is only doubled by the usual averment that the predicate, in what are technically called *reciprocal propositions*, is taken universally *vi materiæ* and not *vi formæ.*

But, 4°, The non-quantification of the predicate in thought is given up by the logicians themselves, but only in certain cases where they were forced to admit, and to the amount which they could not possibly deny. The predicate,

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*nihil aliud ab homine currit.* Vocatur hæc expositio NISE.

"III. *Propositio exclusiva, in qua signum non negatur, universalis negativa*, ut, *Tantum nullus homo currit*, exponitur sic, *Nullus homo currit. et quodlibet aliud ab homine currit*, vocatur TENAX.

"IV. *Exclusiva cujus signum non negatur particularis vel indefinita negativa*, ut, *Tantum homo non currit*, exponitur sic, *Homo non currit, et quodlibet aliud ab homine currit*, vocatur STORAX.

"V *Exclusiva, in qua signum negatur, affirmativa et universalis*, ut, *Non tantum omnis homo currit*, exponitur sic, *Omnis homo currit, et aliquod aliud ab homine currit*, vocatur CANOS

"VI. *In qua signum negatur, existens universalis affirmativa*, ut, *Non tantum nullus homo currit*, sic exponitur, *Nullus homo currit, et aliquid aliud ab homine non currit*, vocatur FECIT.

"VII. *Exclusiva, in qua signum negatur, existens particularis affirmativa*, ut, *Non tantum aliquis homo currit*. expositur sic, *Aliquis homo currit, aliquid aliud ab homine currit*, vocatur PILOS.

"VIII *Negativa particularis exclusivæ propositiones, cujus signum negatur*, ut, *Non tantum aliquis homo non currit*, exponitur sic, *Aliquis homo non currit, et aliquid aliud ab homine non currit*, vocatur NOBIS.

"Differentia autem propositionis exclusivæ et exceptivæ est evidens. Nempe exclusiva prædicatum vendicat uni subjecto, aut a subjecto excludit alia prædicata, ut, *Solus Deus bonus est.* Exceptiva autem statuit universale subjectum, indicatque aliquid contineri sub isto universali, de quo non dicatur prædicatum, ut, *Omne animal est irrationale, præter hominem.*" — ED.]

they confess, is quantified by particularity in affirmative, by universality in negative, propositions. But why the quantification, formal quantification, should be thus restricted in thought, they furnish us with no valid reason.

To these two errors I might perhaps add, as a third, the confusion and perplexity arising from the attempt of Aristotle and the logicians to deal with indefinite (or, as I would call them, *indesignate*) terms, instead of treating them merely as verbal ellipses, to be filled up in the expression before being logically considered; and I might also add, as a fourth, the additional complexity and perplexity introduced into the science by viewing propositions, likewise, as affected by the four or six modalities. But to these I shall not advert.

These are the two principal errors which have involved our systems of Logic in confusion, and prevented their evolution in simplicity, harmony, and completeness; — which have condemned them to bits and fragments of the science, and for these bits and fragments have made a load of rules and exceptions indispensable, to avoid falling into frequent and manifest absurdity. It was in reference to these two errors chiefly that I formerly gave you as a self-evident Postulate of Logic — "Explicitly to state what has been implicitly thought;" in other words, that before dealing logically with a proposition, we are entitled to understand it; that is, to ascertain and to enounce its meaning. This qualification of the predicate of a judgment is, indeed, only the beginning of the application of the Postulate; but we shall find that at every step it enables us to cast away, as useless, a multitude of canons, which at once disgust the student, and, if not the causes, are at least the signs, of imperfection in the science.

I venture, then, to assert that there is only one species of Conversion, and that one thorough-going and self-sufficient. I mean Pure, or Simple Conversion. The other species — all are admitted to be neither thorough-going nor self-sufficient — they are in fact only other logical processes, accidentally combined with a transposition of the subject and predicate. The *conversio per accidens* of Boethius, as an ampliative operation, has no logical existence; it is material and precarious, and has righteously been allowed to drop out of science. It is now merely a historical curiosity. As a Restrictive operation, in which relation alone it still stands in our systems, it is either merely fortuitous, or merely possible through a logical process quite distinct from Conversion; I mean that of Restriction or Subalternation, which will be soon explained. *Conversio per contrapositionem* is a change of terms, — a substitution of new elements, and only holds through contradiction,[1] being just as good without as

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[1] [See Aristotle, *Topica*, L. ii. c. 8. Scotus, Bannes, Mendoza, silently following each other, have held that contraposition is only mediate, infinitation, requiring *Constantia*, etc. Wholly wrong. See Arriaga. *Cursus Philosophicus*, D. II s. 4 p. 18. "Observandum est prædictas consequentias (per contrapositionem) malas esse et instabiles, nisi accesserit alia propositio in antecedenti quæ impartit existentiam subjecti consequentis. Tunc enim firma erit consequentia, *e. g. Omnis homo est albus et non album est, ergo omne non album est non homo.* Alioquin si *constantiam* illam non posueris in antecedenti, instabitur illi consequentiæ in eventu, in quo nihil sit non album, et omnis homo sit albus." Bannes, *Instit. Min. Dial.* L. vi. c. 2, p. 530. — ED ]

Rule for Finite Prejacents given.

With the single exception of E n E (A n A), the other seven propositions may be converted by Counterposition under the following rule, —'Let the terms be infinitated and transposed, the predesignations remaining as before'

With the two additional exceptions of the two convertible propositions, A f I, and I f with conversion. The Contingent Conversion of the lower Greeks[1] is not a conversion, — is not a logical process at all, and has been worthily ignored by the Latin world. But let us now proceed to see that Simple Conversion, as I have asserted, is thorough-going and all-sufficient. Let us try it in all the eight varieties of categorical propositions. But I shall leave this explication to yourselves, and in the examination will call for a statement of the simple conversion, as applied to all the eight propositional forms.

It thus appears that this one method of conversion has every advantage over those of the logicians. 1°, It is Natural; 2°, It is Imperative; 3°, It is Simple; 4°, It is Direct; 5°, It is Precise; 6°, It is thorough-going: Whereas their processes are — 1°, Unnatural; 2°, Precarious; 3°, Complex; 4°, Circuitous; 5°, Confused; 6°, Inadequate: breaking down in each and all of their species. The Greek Logicians, subsequent to Aristotle, have well and truly said, ἀντιστροφή ἐστιν ἰσοστροφή τις, "omnis conversio est æquiversio;"[2] that is, all conversion is a conversion of equal into equal; and had they attended to this principle, they would have developed conversion in its true unity and simplicity. They would have considered, 1°, That the absolute quantity of

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A, the infinitated propositions hold good without the transposition of the terms.

Rule for Infinite Prejacents given.

With the single exception of n I f n I (nE = n = nE being impossible), the other six propositions may be converted by Counterposition under the following rule, — 'Let the terms be uninfinitated and transposed, the predesignations remaining as before.'

Contraposition is not explicitly evolved by Aristotle in *Prior Analytics*, but is evolved from his *Topics*, L. ii. cc 1, 8, *alibi*. *De Interpretatione*, c. 14. See Conimbricenses, *In Arist. Dial.*, *An. Prior.*, L. i. q i. p. 271. Bannes, *Instit. Minoris Dialecticæ*, L. v. c. 2, p. 532. Burgersdicius, *Instit. Log.* L. i. c. 32.

First explicitly enounced by Averroes, according to Molinaeus (*Elementa Logica*, L. i. c. 4, p. 54). I cannot find any notice of it in Averroes He ignores it, name and thing. It is in Anonymus, *De Syllogismo*, f. 42 b., in Nicephorus Blemmidas, *Epit. Log*, c. xxxi. p. 222; but long before him Boethius has all the kinds of Conversion, — *Simplex*, *Per Accidens*, et *Per Oppositionem* (*Introductio ad Syllogismos*, p. 576), what he calls *Per Contrapositionem* (*De Syllogismo Categorico*, L. i. 589). Is he the inventor of the name? It seems so. Long before Boethius, Apuleius (in second century) has it as one of the five species of Conversion, but gives it no name — only descriptive; see *De Habitud. Doct. Plat.*, L. iii. p. 33. Alexander, *In An. Pr.*, i. c. 2. f. 10 a. has it as of propositions, not of terms, which is conversion absolutely. Vide Philoponus. *In An. Pr.*, I f. 12 a. By them called ἀντιστροφὴ σὺν ἀντιθέσει. So Magentinus, *In An. Prior*, i. 2, f. 3 b.

That Contraposition is not properly Conversion — (this being a species of consequence) — an æquipollence of propositions, not a conversion of their terms.

Noldius, *Logica Recognita*, c. xii. p. 299 Crakanthorpe, *Logica*, L. iii. c. 10, p. 180 Bannes, *Instit. Min. Dial.*, L. v c. 2, p. 530. Eustachius, *Summa Philosophiæ*, *Logica*, P. II tract. i. q. 3, p. 104 Herbart, *Lehrbuch der Logik*, p. 78. Scotus, *Quæstiones*, *In An. Prior.*, L. i. q. 15. f 258 b Chauvin, *v. Conversio.* Isendoorn, *Cursus Logicus*, p. 308.

That Contraposition is useless and perplexing. See Chauvin, *v. Conversio.* Arriaga, *Cursus*, *Philosophicus*, p. 18. Titius. *Ars Cogitandi*, c. viii § 19 *et seq.* D'Abra de Raconis, *Tot. Phil. Tract.*, *Logica*, ii. qu. 4, p. 315. Bannes, *Instit Min. Dial.*, p. 529 ]

[1] [Blemmidas.] [*Epitome Logica*, c. 31, p. 222. The following extract will explain the nature of this conversion. Ἡ δ' ἐν προτάσεσι γινομένη ἀνιστροφὴ, ἡ τὴν μὲν τάξιν τῶν ὅρων φυλάττει, τὸν αὐτὸν τηροῦσα κατηγορούμενον καὶ τὸν αὐτὸν ὑποκείμενον· μόνην δὲ τὴν ποιότητα μεταβάλλει, ποιοῦσα τὴν ἀποφατικὴν πρότεσιν καταφατικὴν, καὶ καταφατικὴν ἀποφατικήν. Καὶ λέγεται αὕτη ἐνδεχομένη ἀντιστροφὴ, ὡς ἐπὶ μόνης τῆς ἐνδεχομένες ὕλης συνισταμένη· οἷον, τις ἄνθρωπος λούεται, τις ἄνθρωπος οὐ λούηται· αὕτη δ' οὐκ ἂν εἴη κυρίως ἀντιστροφή. This so-called *contingent conversion* is in fact nothing more than the assertion, repeated by many Latin logicians, that in contingent matter subcontrary propositions are both true — ED.]

[2] See p. 515. — ED.

the proposition, be it convertend or converse, remains always identical; 2°, That the several quantities of the collated notions remain always identical, the whole change being the transposition of the quantified notion, which was in the subject place, into the place of predicate, and *vice versâ*.

Aristotle and the logicians were, therefore, wrong; 1°, In not considering the proposition simply as the complement, that is, as the equation or non-equation, of two compared notions, but, on the contrary, considering it as determined in its quantity by one of these notions more than by the other. 2°, They were wrong in according too great an importance to the notions considered as propositional terms, that is, as subject and predicate, independently of the import of these notions in themselves. 3°, They were wrong in according too preponderant a weight to one of these terms over the other; but differently in different parts of the system. For they were wrong, in the doctrine of Judgment, in allowing the quantity of the proposition to be determined exclusively by the quantity of the subject term; whereas they were wrong, as we shall see, in the doctrine of Reasoning, in considering a syllogism as exclusively relative to the quantity of the predicate (extension). So much for the theory of Conversion. Before concluding, I have, however, to observe, as a correction of the prevalent ambiguity and vacillation, that the two propositions of the process together might be called the *convertent* or *converting (propositiones convertentes)*; and whilst of these the original proposition is named the *convertend (propositio convertenda)*, its product would obtain the title of *converse, converted (propositio conversa)*.[1]

The other species of Immediate Inference will not detain us long. Of these, there are two noticed by the logicians.

The first of these, *Equipollence (æquipollentia)*, or, as I would term it, *Double Negation*, is deserving of bare mention. It is of mere grammatical relevancy. The negation of a negation is tantamount to an affirmation. *B is not not-A*, is manifestly only a roundabout way of saying *B is A*; and, *vice versâ*, we may express a position, if we perversely choose, by sublating a sublation. The immediate inference of Equipollence is thus merely the grammatical translation of an affirmation into a double negation, or of a double negation into an affirmation. *Non-nullus* and *non-nemo*, for example, are merely other grammatical expressions for *aliquis* or *quidam*. So *Nonnihil*, *Nonnunquam*, *Nonnusquam*, etc.

The Latin tongue is almost peculiar among languages for such double negatives to express an affirmative. Of course the few which have found their place in Logic, instead of being despised or relegated to Grammar, have been fondly commented on by the ingenuity of the scholastic logicians. In English, some authors are fond of this indirect and idle way of speaking; they prefer saying — "I entertain a not unfavorable opinion of such a one," to saying directly, I entertain of him a favorable opinion. Neglecting this, I pass on to

The third species of Immediate Inference, noticed by the logicians. This they call *Subalternation*, but it may be more unambiguously styled *Restriction*. If I have £100 at my credit in the bank, it is evident that I may draw for £5 or £10. In like manner, if I can say unexclusively that *all men are animals*, I can say restrictively, that *negroes or any other fraction of mankind are animals.* This restriction is Bilateral, when we restrict both subject and predicate, as:

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[1] See p. 185. — Ed.

*All Triangle is all trilateral.* *All rational is all risible.*
*∴Some triangle is some trilateral.* *∴Some rational is some risible.*

It is Unilateral, by restricting the omnitude or universality either of the Subject or of the Predicate.

Of the Subject —

*All man is some animal;*
*∴Some man is some animal.*

Of the Predicate, as —

*Some animal is all risible;*
*∴Some animal is some risible.*

It has not been noticed by the logicians, that there is only an inference by this process, if the *some* in the inferred proposition means *some at least*, that is, *some* not exclusive of *all;* for if we think by the *some*, *some only*, that is, *some, not all*, so far from there being any competent inference, there is in fact a real opposition. The logicians, therefore, to vindicate their doctrine of the Opposition of Subalternation, ought to have declared that the *some* was here in the sense of *some only;* and to vindicate their doctrine of the Inference of Subalternation, they ought, in like manner, to have declared, that the *some* was here taken in the counter sense of *some at least.* It could easily be shown that the errors of the logicians in regard to Opposition are not to be attributed to Aristotle.

Before leaving this process, it may be proper to observe that we might well call its two propositions together the *restringent* or *restrictive (propositiones restringentes* vel *restrictivæ);* the given proposition might be called the *restringend (propositio restringenda)*, and the product the *restrict* or *restricted (propositio restricta).*

So much for the species of Immediate Inference recognized by the logicians.

There is, however, a kind of immediate inference overlooked by logical writers. I have formerly noticed that they enumerate (among the species of Opposition) *Subcontrariety (subcontrarietas,* ὑπεναντιότης), to wit, — *some is, some is not;* but that this is not in fact an opposition at all (as in truth neither is Subalternation in a certain sense). Subcontrariety, in like manner, is with them not an opposition between two partial *somes*, but between different and different; in fact, no opposition at all. But if they are thus all wrong by commission, they are doubly wrong by omission, for they overlook the immediate inference which the relation of propositions in Subcontrariety affords. This, however, is sufficiently manifest. If I can say, *All men are some animals*, or *Some animals are all men*, I am thereby entitled to say, — *All men are not some animals*, or *Some animals are not some men.* Of course here the *some* in the inferred propositions means *some other*, as in the original proposition, *some only:* but the inference is perfectly legitimate, being merely a necessary explication of the thought; for, inasmuch as I think and say that *all men are* *some animals*, I can think and say that they are some animals only, which implies that they are a certain some, and not any other animals.[1] This inference is thus not only to some others indefinitely, but to all others definitely. It is further either affirmative from a negative antecedent, or negative from an affirmative. Finally, it is not bilateral, as not of subject and predicate at once; but it is unilateral, either of the subject or of the predicate. This inference of Subcontrariety I would call *Integration*, because the mind here tends to determine all the parts of a whole, whereof a part only has been given. The two propositions together might be called the *integral* or *integrant (propositiones integrales vel integrantes)*. The given proposition would be styled the *integrand (propositio integranda)*; and the product, the *integrate (propositio integrata)*.[2]

I may refer you, for various observations on the Quantification of the Predicate, to the collection published under the title, *Discussions on Philosophy and Literature*.

The grand general or dominant result of the doctrine on which I have already partially touched, but which I will now explain consecutively and more in detail, is as follows: — Touching Propositions, — Subject and Predicate; — touching Syllogisms, — in Categoricals, Major and Minor Terms, Major and Minor Premises, Figures First, Second, Third, Fourth, and even what I call *No Figure*, are all made convertible with each other, and all conversion reduced to a simple equation; whilst in Hypotheticals, both the species (viz., Conjunctive and Disjunctive reasonings) are shown to be forms not of mediate argumentation at all, but merely complex varieties of the immediate inference of Restriction or Subalternation, and are relieved of a load of perversions, limitations, exceptions, and rules. The differences of Quantity and Quality, etc., thus alone remain; and by these exclusively are Terms, Propositions, and Syllogisms formally distinguished. Quantity and Quality combined constitute the only real discrimination of Syllogistic Mood. Syllogistic Figure vanishes, with its perplexing apparatus of special rules; and even the General Laws of Syllogism proper are reduced to a single compendious canon.

This doctrine is founded on the postulate of Logic: — To state in language what is efficient in thought; in other words, Before proceeding to deal logically with any proposition or syllogism, we must be allowed to determine and express what it means.

First, then, in regard to Propositions: In a proposition, the two terms, the Subject and Predicate, have each their quantity in thought. This quantity is not always expressed in language, for language tends always to abbreviation; but it is always understood. For example, in the proposition, *Men are animals*, what do we mean? We do not mean that *some men*, to the exclusion of others, are animals, but we use the abbreviated expression *men* for the thought *all men.* Logic, therefore, in virtue of its postulate, warrants, nay requires, us to state this explicitly. Let us, therefore, overtly quantify the subject, and say, *All men are animals.* So far we have dealt with the proposition, — we have quantified in language the subject, as it was quantified in thought.

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[1] If we say *some animal is all man*, and *some animal is not any man*. — in that case, we must hold *some* as meaning *some only*. We may have a mediate syllogism on it, as:

*Some animals are all men;*
*Some animals are not any man;*
*Therefore, some animals are not some animals.*

[2] *Mem.* Immediate inference of Contradiction omitted. Also of Relation, which would come under Equipollence. [For Tabular Schemes of Propositional Forms, and of their Mutual Relations, see pp. 529, 530. — Ed.]

But the predicate still remains. We have said — *All men are animals.* But what do we mean by *animals?* Do we mean *all animals*, or *some animals?* Not the former; for dogs, horses, oxen, etc., are animals, as well as men; and dogs, horses, oxen, etc., are not men. Men, therefore, are animals, but exclusively of dogs, horses, oxen, etc. *All men*, therefore, are not equivalent to *all animals;* that is, we cannot say, as we cannot think, that *all men are all animals.* But we can say, for in thought we do affirm, that *all men are some animals.*

But if we can say, as we do think, that *all men are some animals*, we can, on the other hand, likewise say, as we do think, that *some animals are all men.*

If this be true, it is a matter of indifference, in a logical point of view (whatever it may be in a rhetorical), which of the two terms be made the subject or predicate of the proposition; and whichsoever term is made the subject in the first instance, may, in the second, be converted into the predicate; and whichsoever term is made the predicate in the first instance, may, in the second, be converted into the subject.

From this it follows —

1°, That a proposition is simply an equation, an identification, a bringing into congruence, of two notions in respect to their Extension. I say, in respect to their Extension, for it is this quantity alone which admits of ampliation or restriction, the Comprehension of a notion remaining always the same, being always taken at its full amount.

2°, The total quantity of the proposition to be converted, and the total quantity of the proposition the product of the conversion, is always one and the same. In this unexclusive point of view, all conversion is merely *simple conversion:* and the distinction of a conversion, as it is called, *by accident*, arises only from the partial view of the logicians, who have looked merely to the quantity of the subject. They, accordingly, denominated a proposition *universal* or *particular*, as its subject merely was quantified by the predesignation *some* or *all;* and where a proposition like, *All men are animals* (in thought, *some animals*), was converted into the proposition, *Some animals are men* (in thought, *all men*), they erroneously supposed that it lost quantity, was restricted, and became a particular proposition.

It can hardly be said that the logicians contemplated the reconversion of such a proposition as the preceding; for they did not (or rarely) give the name of *conversio per accidens* to the case in which the proposition, on their theory, was turned from a particular into a universal, as when we reconvert the proposition, *Some animals are men*, into the proposition, *All men are animals.*[1] They likewise neglected such affirmative propositions as had in thought both subject and predicate quantified to their whole extent; as, *All triangular figure is trilateral*, that is, if expressed as understood, *All triangular is all trilateral figure*, — *All rational is risible*, that is, if explicitly enounced, *All rational is all risible animals*. Aristotle, and subsequent logicians, had indeed frequently to do with propositions in which the predicate was taken in its full extension. In these the logicians — but, be it observed, not Aristotle — attempted to remedy the imperfection of the Aristotelic doctrine, which did not allow the quantification of the predicate to be taken logically or formally into account in affirmative propositions, by asserting that in the obnoxious cases the predicate was distributed, that is, fully quantified, in virtue of the matter, and not in virtue of the form (*vi materiæ, non ratione formæ*). But this is altogether erroneous. For in thought we generally do, nay, often must, fully quantify the predicate. In our logical conversion, in fact, of a proposition like *All men are animals*, — *some animals*, we must formally retain in thought, for we cannot formally abolish, the universal quantification of the predicate. We, accordingly, must formally allow the proposition thus obtained, *Some animals are all men*.

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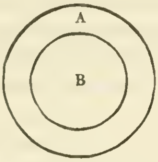
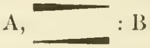
[1] See above, p. 186. — Ed. [A mistake by logicians in general, that partial conversion, *ἐν μέρει*, is the mere synonym of *per accidens*, and that the former is so used by Aristotle. See Vallius, *Logica*, t. ii. l t q. i. c. 2, p. 32. For Aristotle uses the terms *universal*, and *partial conversion*, simply to express whether the *convertens* is a universal or particular proposition. See § 4 of the chapter on Conversion (*An. Prior.*, i. 2), where particular af

The error of the logicians is further shown by our most naked logical notation; for it is quite as easy and quite as natural to quantify A, B, or C, as predicate, as to quantify A, B, or C, as subject. Thus, *All* B *is some* A; *Some* A *is all* B.





I may here also animadvert on the counter defect, the counter error, of the logicians, in their doctrine of Negative Propositions. In negative propositions they say the predicate is always distributed, — always taken in its full extension. Now this is altogether untenable. For we always can, and frequently do, think the predicate of negative propositions as only partially excluded from the sphere of the subject. For example, we can think, as our naked diagrams can show, — *All men are not some animals*, that is, not irrational animals. In point of fact, so often as we think a subject as partially included within the sphere of a predicate, *eo ipso* we think it as partially, that is, particularly, excluded therefrom. Logicians are, therefore, altogether at fault in their doctrine, that the predicate is always distributed, *i. e.*, always universal, in negative propositions.[1]

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firmatives are said to be necessarily converted ἐν μέρει.

*Conversio per accidens* is in two forms differently defined by different logicians. The first by Boethius, by whom the name was originally given, is that in which the quantity of the proposition is contingently changed either from greater to less, or from less to greater, *salva veritate*, the quality of the terms and propositions remaining always the same. So Ridiger, *De Sensu Veri et Falsi*, p. 303. The second is that of logicians in general, where the quantity of the proposition is diminished, the quality of the propositions and terms remaining the same, *salva veritate*.]

[1] Melanchthon (*Erotemata*, L. ii. *De Conversione*, p. 516), followed by his pupil and commentator Strigelius (*In Erotemata*, pp

But, 3°, If the preceding theory be true, — if it be true that subject and predicate are, as quantified, always simply convertible, the proposition being in fact only an enouncement of their equation, it follows (and this also is an adequate test) that we may at will identify the two terms by making them both the subject or both the predicate of the same proposition. And this we can do. For we can not only say — as A *is* B, so conversely B *is* A, or as *All men are some animals*, so, conversely, *Some animals are all men;* but equally say — A *and* B *are convertible*, or, *Convertible are* B *and* A; *All men and some animals are convertible* (that is, *some convertible things*), or, *Convertible* (that is, *some convertible things*) *are some animals and all men.* By *convertible*, I mean the same, the identical, the congruent, etc.[1]

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576, 581), and by Keckermann (*Syst. Log. Minus*, L. ii. c. 3, *Op.* p. 222), and others, thinks that "there is a greater force of the particle *none* (*nullus, not any*), than of the particle *all* (*omnis*). For, in a universal negative, the force of the negation is so spread over the whole proposition, that in its conversion the same sign is retained (as — *No star is consumed; therefore, no flame which is consumed is a star*): whereas such conversion does not take place in a universal affirmative." This Strigelius compares to the diffusion of a ferment or acute poison; adding that the affirmative particle is limited to the subject, whilst the negative extends to both subject and predicate, in other words, to the whole proposition.

This doctrine is altogether erroneous. It is an erroneous theory devised to explain an erroneous practice. In the first place, we have here a commutation of negation with quantification; and, at the same time, conversion, direct conversion at least, will not be said to change the quality either of a negative or affirmative proposition. In the second place, it cannot be pretended that negation has an exclusive or even greater affinity to universal than to particular quantification. We can equally well say *not some, not all, not any;* and the reason why one of these forms is preferred lies certainly not in any attraction or affinity to the negative particle ]

[1] [With the doctrine of Conversion taught in the text, compare the following authorities: Laurentius Valla, *Dialectica*, L. ii. c. 24, f. 37. Titius, *Ars Cogitandi* (v. Ridiger, *De Sensu Veri et Falsi*, L ii c. i. p 232). Reusch, *Systema Logicum*, § 380, p. 413 *et seq.*, ed. 1741. Hollmann, *Logica*, § 89, p. 172. Ploucquet. Fries, *Logik*, § 33, p. 146. E Reinhold, *Logik*, § 117, p. 286. Ancients referred to by Ammonius, *In De Interp.*, c vii. § 4, f. . . . . Paulus Vallius, *Logica*, t ii., *In An Prior.*, L. i. q. ii. c iv ] [Valla *l. c.* says: "Non amplius ac latius accipitur prædicatum quam subjectum. Ideoque cum illo converti potest, ut *omnis homo est animal;* non utique totum genus animal, sed aliqua pars hujus generis. . . . ergo, *Aliqua pars animalis est in omni homine.* Item, *Quidam homo est animal,* scilicet est *quædam pars animalis*, ergo, *Quædam pars animalis est quidam homo*, etc." Gottlieb Gerhard Titius, *Ars Cogitandi*, c. vii. § 3 *et seq.*, p. 125. Lipsiæ, 1723 (first ed. 1701). "Nihil autem aliud agit Conversio, quam ut simpliciter prædicatum et subjectum transponat, hinc nec qualitatem nec quantitatem iis largitur, aut eas mutat, sed prout reperit, ita convertit. Ex quo necessario sequitur conversionem esse uniformem ac omnes propositiones eodem plane mode converti. Per exempla, (1), *Nullus homo est lapis*, ergo, *Nullus lapis est homo.* (2), *Quidam homo non est medicus* (*omnis*), ergo, *Medicus non est homo quidam*, seu *Nullus medicus est homo quidam*. . . . . (3), *Hic Petrus non est doctus* (*omnis*), ergo, *Omnis doctus non est hic Petrus*. . . . . (4), *Omnis homo est animal* (*quoddam*), ergo, *Quoddam animal est homo*. (5), *Quidam homo currit* (*particulariter*), ergo, *Quidam currens est homo.* (6), *Hic Paulus est doctus* (*quidam*), ergo, *Quidam doctus est hic Paulus.* In omnibus his exemplis subjectum cum sua quantitate in locum prædicati, et hoc, eodem modo, in illius sedem transponitur, ut nulla penitus ratio solida appareat, quare conversionem in diversas species divellere debeamus. Vulgo tamen aliter sentiunt quando triplicem conversionem, nempe *simplicem*, *per accidens*, ac *per contrapositionem*, adstruunt. . . . . Enimvero conversio *per accidens* et *per contrapositionem* gratis asseritur, nam conversio propositionis affirmantis universalis perinde simplex est ac ea qua universalis negans convertitur, licet post eam subjectum sit particulare; conversionis enim hic nulla culpa est, quæ quantitatem, quæ non adest, largiri nec potest nec debet. . . . . Error vulgaris doctrinæ, nisi fallor, inde est, quod existimaverint ad conversionem simplicem requiri, *ut prædicatum assumat signum et quantitatem subjecti*. . . . . Conversionem *per contrapositionem* quod attinet, facile ostendi

The general errors in regard to Conversion, — the errors from which all the rest proceed, are —

1°. The omission to quantify the predicate throughout.

2°. The conceit that the quantities did not belong to the terms.

3°. The conceit that the quantities were not to be transposed with their relative terms.

4°. The one-sided view that the proposition was not equally composed of the two terms, but was more dependent on the subject than on the predicate.

5°. The consequent error that the quantity of the subject term determines the quantity of the proposition absolutely.

6°. The consequent error that there was any increase or diminution of the total quantity of the proposition.

7°. That thorough-going conversion could not take place by one, and that the simple, form.

8°. That all called in at least the form of Accidental Conversion; all admitting at the same time that certain moods remain inconvertible.

9°. That the majority of logicians resorted to Contraposition (which is not a conversion at all); some of them, however, as Burgersdyk, admitting that certain moods still remained obstinately inconvertible.

10°. That they thus introduced a form which was at best indirect, vague, and useless, in fact not a conversion at all.

11°. That even admitting that all the moods were convertible by one or other of the three forms, the same mood was convertible by more than one.

12°. That all this mass of error and confusion was from their overlooking the necessity of one simple and direct mode of conversion; missing the one straight road.

We have shown that a judgment (or proposition) is only a comparison resulting in a congruence, an equation, or non-equation of two notions in the quantity of Extension; and that these compared notions may stand to each

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potest (1) exempla heic jactari solita, posse converti simpliciter; (2) conversionem per contrapositionem, revera non esse conversionem; interim (3) putativam istam conversionem non in universali affirmante, et particulari negante solum, sed in omnibus potius propositionibus locum habere. . . . *e. g.*, *Quoddam animal non est quadrupes*, ergo, *Nullus quadrupes est animal quoddam.*" See the criticism of the doctrine of Titius by Rüdiger, quoted below, p. 555. Ploucquet, *Methodus Calculandi in Logicis*, p. 49 (1763). "Intellectio *identitatis* subjecti et prædicati est *affirmatio*. . . . *Omnis circulus est linea curva*. Quæ propositio logice expressa hæc est: — *Omnis circulus est quædam linea curva*. Quo pacto id, quod intelligitur in prædicato identificatur cum eo quod intelligitur in subjecto. Sive norim sive non norim præter circulum dari quoque alias curvarum species, verum tamen est *quandam* lineam curvam sensu *comprehensivo* sumtam, esse *omnem* circulum, seu *omnem* circulum esse *quandam* lineam curvam." Vallius, *l. c.* "Negativæ vero convertuntur et in particulares et in universales negativas; ut si dicamus, *Socrates non est lapis*, convertens illius erit, *Aliquis lapis non est Socrates*, et *Nullus lapis est Socrates*, et idem dicendum erit de omni alia simili propositione." — ED.]

[That Universal Affirmative Propositions may be converted simply, if their predicates are reciprocating, see Corvinus, *Instit. Phil. Rat.*, § 514 Ienæ, 1742. Baumgarten, *Logica*, § 280, 1765. Scotus, *In An. Pr.*, L. i. qu. 14. Ulrich, *Instit. Log. et. Met.*, § i. 2, 177 (1785) Kreil, *Logik*, §§ 46, 62 (1789). Isendoorn, *Logica Peripatetica*, L. iii. c 8, pp. 430, 431. Wallis, *Logica*, L. ii. c 7. Zabarella, *In An. Prior. Tabulæ*, p. 148. Lambert, *De Universaliori Calculi Idea*, § 24 *et seq.*]

other as the one subject and the other predicate, as both the subject, or as both the predicate of the judgment. If this be true, the transposition of the terms of a proposition sinks in a very easy and a very simple process; whilst the whole doctrine of logical Conversion is superseded as operose and imperfect, as useless and erroneous. The systems, new and old, must stand or fall with their doctrines of the Conversion of propositions.

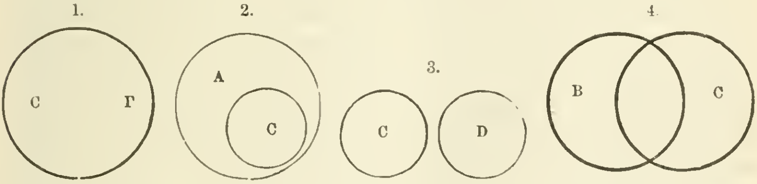
Thus, according to the doctrine of the logicians, conversion applies only to the naked terms themselves: — the subject and predicate of the prejacent interchange places, but the quantity by which each was therein affected is excluded from the movement; remaining to affect its correlative in the subjacent proposition. This is altogether erroneous. In conversion we transpose the compared notions, — the correlated terms. If we do not, *eversion*, not conversion, is the result.

If (as the Logicians suppose) in the *convertens* the subject and predicate took each other's quantity, the proposition would be not the *same relation* of the *same notions*. It makes no difference that the converse only takes place when the subject chances to have an equal amount or a less than the predicate. There must be at any rate a reasoning (concealed indeed) to warrant it: in the former case — that the predicate is entitled to take all the quantity of the subject, being itself of equivalent amount; in the second (a reasoning of subalternation), that it is entitled to take the quantity of the subject, being less than its own. All this is false. Subject and predicate have a right to their own, and only to their own, which they carry with them, when they become each other.

## IV.—Application of Doctrine of Quantified Predicate to Propositions.

### (a) NEW PROPOSITIONAL FORMS—NOTATION.

Instead of four species of Proposition determined by the Quantity and Quality taken together, the Quantity of the Subject being alone considered, there are double that number, the Quantity of the Predicate being also taken into account.



Affirmative.

(1) [A f A] C : ━━━ : Γ All Triangle is all Trilateral [fig. 1].
(ii) [A f I] C : ━━━ , A All Triangle is some Figure (A) [fig. 2].
(3) [I f A] A . ━━━ . C Some Figure is all Triangle [fig. 2].
(iv) [I f I] C , ━━━ , B Some Triangle is some Equilateral (I) [fig. 4].

Negative.

(v) [E n E] C : ▬┼── : D Any Triangle is not any Square (E) [fig. 3].
(A) (A)

(6) [E n O] C : ▬┼── , B Any Triangle is not some Equilateral [fig. 4].
(A) (I)

(vii) [O n E] B , ▬┼── : C Some Equilateral is not any Triangle (O) [fig. 4].
(I) (A)

(8) [O n O] C , ▬┼── , B Some Triangle is not some Equilateral [fig. 4].[1]
(I) (I)

### (b) *QUANTITY OF PROPOSITIONS — DEFINITUDE AND INDEFINITUDE.*

Nothing can exceed the ambiguity, vacillation, and uncertainty of logicians concerning the Quantity of Propositions.

I. As regards what are called *indefinite* (ἀδιόριστοι) more properly *indesignate* or *preindesignate propositions.* The absence of overt quantification applies only to the subject; for the predicate was supposed always in affirmatives to be particular, in negatives to be universal. Referring, therefore, only to the indesignation of the subject: — indefinites were by some logicians (as the Greek commentators on Aristotle (?), Apuleius *apud* Waitz, *In Org.* i. p. 338, but see Wegelin, *In Aneponymi Phil. Syn.*, p. 588) made tantamount to particulars; by others (as Valla, *Dialectica*, L. ii. c. 24, f. 37), made tantamount to universals. They ought to have been considered as merely elliptical, and to be definitely referable either to particulars or universals.[1]

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[1] [In this table the Roman numerals distinguish such propositional forms as are recognized in the Aristotelic or common doctrine, whereas the Arabic ciphers mark those (half of the whole) which I think ought likewise to be recognized. In the literal symbols, I simplify and disintricate the scholastic notation; taking A and I for universal and particular, but, extending them to either quality, marking affirmation by f, negation by n, the two first consonants of the verbs *affirmo* and *nego*, — verbs from which I have no doubt that Petrus Hispanus drew, respectively, the two first vowels, to denote his four complications of quantity and quality.] — *Discussions*, p. 685.

[In the notation employed above, the comma , denotes *some*; the colon : *all*; the line ▬── denotes the affirmative copula, and negation is expressed by drawing a line through the affirmative copula ▬┼── ; the thick end of the line denotes the subject, the thin end the predicate, of Extension. In Intension the thin end denotes the subject, the thick end the predicate. Thus: — C : ▬── , A is read, *All C is some A.* C : ▬┼── : D is read, *No C is any D.* The Table given in the text is from a copy of an early scheme of the author's new Propositional Forms. For some time after his discovery of the doctrine of a quantified predicate, Sir W. Hamilton seems to have used the vowels E and O in the formulæ of Negative Propositions; and the full period (.) as the symbol of *some* (indefinite quantity). In the college session of 1845–46, he had adopted the comma (,) as the symbol of indefinite quantity. As the period appears in the original copy of this Table as the symbol of *some*, its date cannot be later than 1845. The comma (,) has been substituted by the Editors, to adapt the Table to the Author's latest form of notation. The translation of its symbols into concrete propositions, affords decisive evidence of the meaning which the Author attached to them on the new doctrine. That this, moreover, was the uniform import of Sir W. Hamilton's propositional notation, from the earliest development of the theory of a quantified predicate, is placed beyond doubt by numerous passages in papers (not printed), and by marginal notes on books, written at various periods between 1839–40, and the date of his illness, July 1844, when he was compelled to employ an amanuensis. The letters in round brackets (A) and (I) are the vowels finally adopted by the Author, in place of E and O. See p. 531. — Ed.]

II. A remarkable uncertainty prevails in regard to the meaning of particularity and its signs, — *some*, etc. Here *some* may mean *some only*, — *some not all.* Here *some*, though always in a certain degree indefinite, is definite so far as it excludes omnitude, — is used in opposition to *all.* This I would call its *Semi-definite* meaning. On the other hand, some may mean *some at least*, — *some, perhaps all.* In this signification *some* is thoroughly indefinite, as it does not exclude omnitude or totality. This meaning I would call the *Indefinite.*

Now of these two meanings there is no doubt that Aristotle used particularity only in the second, or thoroughly Indefinite, meaning. For, 1°, He does not recognize the incompossibility of the superordinate and subordinate. 2°, He makes *all* and *οὐ πᾶς*, or particular negative, to be contradictories; that is, one necessarily true, the other necessarily false. But this is not the case in the Semi-definite meaning. The same holds good in the Universal Negative and Particular Affirmative.

The particularity — the *some* — is held to be a definite *some* when the other term is Definite, as in ii. and 3, in 6 and vii. On the other hand, when both terms are Indefinite and Particular, as in iv. and 8, the *some* of each is left wholly indefinite.

The quantification of *definitude* or *non-particularity* (:) may designate ambiguously or indifferently one or other of three concepts. 1°, It may designate explicit omnitude or totality: which, when expressed articulately, may be denoted by (: :). Thus — *All triangles are all trilaterals.* 2°, It may designate a class considered as undivided, though not positively thought as taken in its whole extent; and this may be articulately denoted by (: .). Thus — *The triangle is the trilateral; — The dog is the latrant.* (Here note the use of the definite article in English, (Greek, French, German,[2] etc.) 3°, It may designate not

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[1] [That Indefinite propositions are to be referred to universals, see Purchot. *Instit. Phil. Logica*, I. § ii. c. 2, pp. 124, 125, 126. Rottenbeccius, *Logica Contracta*, c. vi. p 92 (1560). Baumeister, *Inst. Phil. Rat.*, § 213. J. C. Scaliger, *Exercitationes*, Ex. 212, § 2. Drobisch, *Logik*, § 39. Neomagus, *Ad Trapezuntium*, f. 10. To be referred to particular: see Lovanienses, *Com in Arist. Dial.* p. 161 Molinæus, *Elementa Logica*, L. I. c. 2. Alex. Aphrod., *In An. Prior.*, c. ii. p. 19. Denzinger, *Logica*, § 71. Either universal or particular, Keckermann. *Opera*. p. 220. Aristotle doubts; see *An. Prior.*, L I. c 27. § 7. and *De Interp* c. 7. That I. definitude is no separate species of quantity, see Scheibler. *Opera Logica*, p iii. c. 6. p 443. Græcus Anonymus, *De Syllogismo*, L i. c. 4. f. 42. Leibnitz, *Opera*, t. iv. p. iii p. 123. Fries, *System der Logik*, § 30, p. 137. Ramus, *Schol. Dial.*, L. vii. c. 2, p. 457. Downam, *In Rami Dialect.*, L. ii. c. 4, p. 350. Facciolati, *Rud. Log.* p. ii c iii., p. 67. Delarivière, *Nouvelle Logique Classique*, L. ii. s. ii. c. 3, s. 580, p. 334

That Indefinitude has sometimes a logical import, when we do not know whether *all*, or *some*, of the one be to be affirmed or denied of the other: E. Reinhold. *Logik*, § 88 Anm. 2, pp. 193, 194. Ploucquet, *Methodus Calculandi*, pp. 48, 53 ed. 1773. Lambert, *Neues Organon*, I., § 235, p 143.]

[2] [On effect of the definite article and its absence in different languages, in reducing the definite to the indefinite, see Delarivière, *Logique*, §§ 580, 581.

On the Greek article, see Ammonius. *In De Interp* c. vii. f. 67 b.

On use of the Arabic article in quantificawhat is merely undivided, though divisible, — a class, but what is indivisible, — an individual; and this may be marked by the small letter or by (: ·) — Thus — *Socrates is the husband of Xanthippe*. — *This horse is Bucephalus.*

In like manner particularity or indefinitude (,), when we wish to mark it as thoroughly indefinite, may be designated by (‘,), whereas when we would mark it as definitely indefinite, as excluding *all* or *not any*, may be marked by (").

The indefinites (ἀόριστα) of Aristotle correspond sometimes to the particular, sometimes to one or other, of the two kinds of universals.[1]

The designation of *indefinitude* or *particularity*, *some* (, or ͺ) may mean one or other of two very different things.

1°, It may mean *some and some only*, being neither *all* nor *none*, and in this sense it will be both affirmative and negative (,ͺ).

2°. It may mean, negatively, *not all*, *perhaps none*, *some at most*; affirmatively, *not none*, *perhaps all*, — *some at least* (, ͺ).

Aristotle and the logicians contemplate only the second meaning. The reason of this perhaps is, that this distinction only emerges in the consideration of Opposition and Immediate Inference, which were less elaborated in the former theories of Logic; and does not obtrude itself in the consideration of Mediate Inference, which is there principally developed. On the doctrine of the logicians, there is no opposition of subalternation; and by Aristotle no opposition of subalternation is mentioned. By other logicians it was erroneously introduced. The opposition of Subcontraries is, likewise, improper, being precarious and not between the same things. Aristotle, though he enumerates this opposition, was quite aware of its impropriety, and declares it to be merely verbal, not real.[2]

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tion, see Averroes, *De Interp.*, p. 39, edition 1552:

"*Al* in the Arabic tongue, and *Ha* in the Hebrew, and in like manner the articles in other languages, sometimes have the power of universal predesignations, sometimes of particular. If the former, then they have the force of contraries; if the latter, then the force of sub-contraries. For it is true to say, *al*, that is, *ipse homo is white*, and *al*, that is, *ipse homo* is *not white*; that is, when the article *al* or *ha*, that is, *ipse*, denotes the designation of particularity. They may, however, be at once false, when the article *al* or *ha* has the force of the universal predesignation." (See also p. 52 of the same book.)

In English the definite article always defines, — renders definite, — but sometimes individualizes, and sometimes generalizes. If we would use *man* generally, we must not prefix the article, as in Greek, German, French, etc.; so *wealth*, *government*, etc. But in definition of *horse*, etc., the reverse, as *the dog* (*le chien*, ὁ κύων, etc.). *A* in English is often equivalent to *any*.]

[1] [Logicians who have marked the Quantities by *Definite*, *Indefinite*, etc.

Aristotle, *An. Pr.*, c. iv. § 21, and there Alexander, Pacius. Theophrastus (Facciolati, *Rud. Log.*, p. i. c. 4. p. 39). Ammonius, *In De Inter.*, f. 72 b (Brandis, *Scholia*, p. 113.) Stoics and Non-peripatetic Logicians in general, see Sext. Empiricus, *Adv. Log.*, § 98 *et seq.*, p. 476, ed. Fabricii; Diog. Laert. Lib. vii. *seq.* 71, *ubi* Menagius. Downam, *In Rami Dialecticam*, L. ii. c. 4, p. 363, notices that a particular proposition "was called by the Stoics *indefinite* (ἀόριστον); by some Latins, and sometimes by Ramus himself, *infinite*; because it does not designate some certain species, but leaves it uncertain and indefinite." Hurtado de Mendoza, *Disp. Log. et Met.*, t. i. d. iv. § 2, p. 114. Lovanienses, *In Arist. Dial.*, p. 161. Hollmann, *Logica*, p. 173. Boethius, *Opera*, p. 345. Reusch, *Syst. Log.*, p. 424. Esser, *Logik*, § 58. Weiss, *Logik*, §§ 149, 150. So Kiesewetter, *Logik*, §§ 102, 103.]

[2] On both forms of Opposition, see Scheibler, [*Opera Logica*, § iii., *de Propositionibus*, c. xi. p. 487, and above, p. 184. — ED.]

By the introduction of the first meaning of *some*, we obtain a veritable opposition in Subalternation; and an inference in Subcontrariety, which I would call *Integration*.

### (c) *OPPOSITION OF PROPOSITIONS.*

Propositions may be considered under two views; according as their particularity, or indefinitude, is supposed to be thoroughly indefinite, unexclusive even of the definite: *some*, meaning *some at least*, *some, perhaps all*, *some, perhaps not any;* or definite indefinitude, and so exclusive of the definite; *some*, meaning *some at most*,—*some only*,—*some not all*, etc. The latter thus excludes omnitude or totality, positive or negative; the former does not. The former is the view promulgated as alone contemplated by Aristotle; and has been inherited from him by the Logicians, without thought of increase or of change. The latter is the view which I would introduce; and though it may not supersede, ought, I think, to have been placed alongside of the other.

Causes of the introduction of the Aristotelic system alone:

1°, To allow a harmony of Logic with common language; for language eliding all that is not of immediate interest, and the determination of the subject-notion being generally that alone intended, the predicate is only considered in so far as it is thought to cover the subject; that is, to be at least coëxtensive with it. But if we should convert the terms, the inadequacy would be brought to light.

2°, A great number of notions are used principally, if not exclusively, as attributes, and not as subjects. Men are, consequently, very commonly ignorant of the proportion of the extension between the subjects and predicates, which they are in the habit of combining into propositions.

3°, In regard to negatives, men naturally preferred to attribute positively a part of one notion to another than to deny a part. Hence the unfrequency of negatives with a particular predicate.

On the doctrine of Semi-definite Particularity, I would thus evolve the Opposition or Incompossibility of propositions, neglecting or throwing aside (with Aristotle) those of *Subalternation* and *Sub-contrariety*, but introducing that of *Inconsistency*.

Incompossibility is either of propositions of the same, or of different, quality. Incompossible propositions differing in quality are either Contradictories without a mean,—no third,—that is, if one be true the other must be false, and if one be false the other must be true; or Contraries with a mean,—a third,—that is, both may be false, but both cannot be true. Incompossible propositions of the same quality are Inconsistents, and, like Contraries, they have a mean; that is, both may be false, but both cannot be true.

Contradictories are again either simple or complex. The simple are either, 1°, Of Universals, as undivided wholes; or, 2°, Of Individuals, as indivisible parts.[1]

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[1] General terms, used as individual terms, when opposed to each other, may be contradictories, as *Man is mortal*, *Man is not mortal*. So that there are three kinds of contradictories.

The complex are of universals divided, as 4—5.

Contraries, again, which are only of divided universals, are, 1°, Bilateral, as 1—5; or, 2°, Unilateral, as 1—6, 1—7, 2—5, 3—5; or, 3°, Cross, as 2—7, 3—6.

Inconsistents are either, 1°, Affirmatives; or, 2°, Negatives. Affirmatives, as 1—2, 1—3, 2—3. Negatives, as 5—6, 5—7. The propositions 6—7 are sometimes Inconsistents, sometimes Consistents.

All the other propositional forms, whether of the same or of different qualities, are Compossible, or Unopposed.

The differences in compossibility of the two schemes of Indefinite and Definite particularity lies, 1°, In the whole Inconsistents; 2°, In two Contraries for Contradictories. 1°, According to the former, all affirmative and all negative propositions are consistent, whereas in the latter these are inconsistent, 1—2, 1—3, 2—3: among the affirmatives, and among the negatives, 5—6, 5—7. (As said before, 6—7 is in both schemes sometimes compossible, and sometimes incompossible.) 2°, Two incompossibles, to wit, 2—7, 3—6, which, on the Aristotelic doctrines, are Contradictories, are in mine Contraries.

The propositional form 4 is consistent with all the affirmatives; 8 is not only consistent with all the negatives, but is compossible with every other form in universals. It is useful only to divide a class, and is opposed only by the negation of divisibility.

By adopting exclusively the Indefinite particularity, logicians threw away some important immediate inferences; those, to wit, 1°, From the affirmation of one *some* to the negation of another, and *vice versa*: and, 2°, From the affirmation of one inconsistent to the negation of another. 1°, Thus, on our system, but not on theirs, affirming *all man to be some animal*, we have a right to infer that *no man is some (other) animal*; affirming that *some animal is all man*, we have a right to infer that *some (other) animal is not any man*; affirming *some men are some blacks (Negroes)*, we are entitled to say that *(same) some men are not some (other) blacks (Hindoos)*, and also that *(other) some men are not the (same) some blacks*. And so backwards from negation to affirmation. This inference I would call that of [Integration].

2°, Affirming *all men are some animals*, we are entitled to infer the denial of the propositions, *all men are all animals*, *some men are all animals*. And so in the negative inconsistents.

### AFFIRMATIVES.

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|---|---|---|---|---|---|
| 1.) | Toto-total | = Afa = | All — is all —. | |
| ii.) | Toto-partial | = Afi = | All — is some —. | (A) |
| 3.) | Parti-total | = Ifa = | Some — is all —. | |
| iv.) | Parti-partial | = Ifi = | Some — is some —. | (I) |

### NEGATIVES.

| | | | | |
|---|---|---|---|---|
| v.) | Toto-total | = Ana = | Any — is not any —. | (E) |
| 6.) | Toto-partial | = Ani = | Any — is not some —. | |
| vii.) | Parti-total | = Ina = | Some — is not any —. | (O) |
| 8.) | Parti-partial | = Ini = | Some — is not some —. | |

## TABLE of the Mutual Relations of the Eight Propositional Forms on Either System of Particularity. (For Generals only.)

| Common to I. and II., in either of which all Propositions are related. Of these their | | I. Incompossibility of Proposition with Proposition, on the System of | | II. Inference from Proposition to Proposition, on the two Systems. | | |
|---|---|---|---|---|---|---|
| Number and Quality. | Value. | 1. Indefinite Definitude. (*Some at least.*) | 2. Definite Indefinitude. (*Some at most.*) | To wit, from—to. | 1. Indefinite Definitude. (*Some at least.*) | 2. Definite Indefinitude. (*Some at most.*) |
| Affirmat. | | | | | | |
| 1—ii | Afa — Afi | | Incons. un. | 1—ii | Restr. un. | |
| 1—3 | Afa — Ifa | | Incons. un. | 1—3 | Restr. un. | |
| 1—iv | Afa — Ifi | | | 1—iv | Restr. bi. | Restr. bi. |
| ii—3 | Afi — Ifa | | Incons. un. cr. | | | |
| ii—iv | Afi — Ifi | | | ii—iv | Restr. un. | Restr. un. |
| 3—iv | Ifa — Ifi | | | 3—iv | Restr. un. | Restr. un. |
| Negat. | | | | | | |
| v—6 | Ana — Ani | | Incons. un. | v—6 | Restr. un. | |
| v—vii | Ana — Ina | | Incons. un. | v—vii | Restr. un. | |
| v—8 | Ana — Ini | | | v—8 | Restr. bi. | Restr. bi. |
| 6—vii | Ani — Ina | Doubtful, cr. | Doubtful, cr. | | | |
| 6—8 | Ani — Ini | | | 6—8 | Restr. un. | Restr. un. |
| vii—8 | Ina — Ini | | | vii—8 | Restr. un. | Restr. un. |
| Aff. Neg. | | | | | | |
| 1—v | Afa — Ana | Contrar. bi. | Contrar. bi. | | | |
| 1—6 | Afa — Ani | Contrar. un. | Contrar. un. | | | |
| 1—vii | Afa — Ina | Contrar. un. | Contrar. un. | | | |
| 1—8 | Afa — Ini | | | 1—8 | | Res. & Int. bi. |
| ii—v | Afi — Ana | Contrar. un. | Contrar. un. | | | |
| ii—6 | Afi — Ani | | | ii—6 | | Integr. un. |
| ii—vii | Afi — Ina | Repugn. bi. cr. | Contrar. bi cr. | | | |
| ii—8 | Afi — Ini | | | ii—8 | | Res. & Int. un. |
| 3—5 | Ifa — Ana | Contrar. un. | Contrar. un. | | | |
| 3—6 | Ifa — Ani | Repugn. bi. cr. | Contrar. bi. cr. | | | |
| 3—vii | Ifa — Ina | | | 3—vii | | Integr. un. |
| 3—8 | Ifa — Ini | | | 3—8 | | Res. & Int. un. |
| iv—v | Ifi — Ana | Repugn. bi. di. | Contrar. bi. di. | | | |
| iv—6 | Ifi — Ani | | | iv—6, 6—iv | | Res. & Int. un. |
| iv—vii | Ifi — Ina | | | iv—vii, vii—iv | | Res. & Int. un. |
| iv—8 | Ifi — Ini | | | iv—8, 8—iv | | Integr. bi. |

Abbreviations: — bi. = *bilateral;* cr. = *cross;* Contrar. = *Contraries;* di. = *direct;* Incons. = *Inconsistents;* Int. or Integr. = *Integration;* Repugn. = *Repugnants, Contradictories;* Res. or Restr. = *Restriction, Subalternation;* un. = *unilateral.* Blanks: in I. = *Compossibles;* in II. = *No inference.* — (*Unilateral, bilateral, cross, direct,* refer to the Extremes.)

The preceding Table may not be quite accurate in details.

## V. — SYLLOGISMS.

### OBSERVATIONS ON THE MUTUAL RELATIONS OF SYLLOGISTIC TERMS IN QUANTITY AND QUALITY.

General Canon. — *What worst relation of subject and predicate subsists between either of two terms and a common third term, with which one, at least, is positively related; that relation subsists between the two terms themselves.*

There are only three possible relations of Terms (notions, representations, presentations).

1°. The relation of *Toto-total Coïnclusion* (coïdentity, absolute convertibility or reciprocation) (AfA).

2°, The relation of *Toto-total Coëxclusion* (non-identity, absolute inconvertibility or non-reciprocation) (AnA).

3°, The relation of *Incomplete Coïnclusion*, which involves the counter-relation of *Incomplete Coëxclusion* (partial identity and non-identity, relative convertibility and non-convertibility, reciprocation, and non-reciprocation). This is of various orders and degrees.

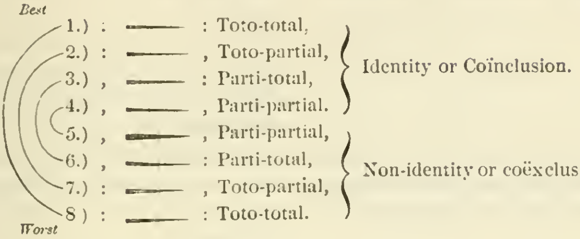
a) Where the whole of one term and the part of another are coïnclusive or coïdentical (AfI). This I call the relation of *toto-partial coïnclusion*, as, *All men are some animals.* This necessarily involves the counter-relation of *toto-partial coëxclusion* (AnI), as, *Any man is not some animal.* But the converse of this affirmative and negative affords the relations of

b) *Parti-total Coïnclusion* (IfA) and *Coëxclusion* (InA), as, *Some animal is all man*, *Some animal is not any man.*

c) There is still a third double relation under this head, when two terms partially include and partially exclude each other (IfI InI), as, *Some women are some authors*, and *Some women are not some authors.* This relation I call that of *Parti-partial Coïnclusion* and *Parti-partial Coëxclusion.*

Of these three general relations, the first is [technically styled] the best; the second is the worst; and the third is intermediate.

Former logicians knew only of two worse relations, — a particular, worse than a universal, affirmative, and a negative worse than an affirmative. As to a better and worse in negatives, they knew nothing; for as two negative premises were inadmissible, they had no occasion to determine which of two negatives was the worse or better. But in quantifying the predicate, in connecting positive and negative moods, and in generalizing a one supreme canon of syllogism, we are compelled to look further, to consider the inverse procedures of affirmation and negation, and to show (*e. g.*, in v. a. and vi. b., ix. a. and x. b.) how the latter, by reversing the former, and turning the best quantity of affirmation into the worst of negation, annuls all restriction, and thus apparently varies the quantity of the conclusion. It thus becomes necessary to show the whole order of best and worst quantification throughout the two qualities, and how affirmation commences with the whole in Inclusion and Negation, with the parts in Exclusion.[1]


Best
1.) : ——— : Toto-total,
2.) : ——— , Toto-partial,
3.) , ——— : Parti-total,
4.) , ——— , Parti-partial.
Identity or Coïnclusion.
5.) , ——— , Parti-partial,
6.) , ——— : Parti-total,
7.) : ——— , Toto-partial,
8.) : ——— : Toto-total.
Non-identity or coëxclusion.
Worst

As the negation always reduces the best to the worst relation, in the intermediate relations determining only a commutation from equal to equal, whilst in both the symbols of quantity, in their inverse signification, remain externally the same; it is evident that the quantification of the conclusion will rarely be apparently different in the negative from what it is in the corresponding positive mood. There are, indeed, only four differences to be found in the negative from the positive conclusions, and these all proceed on the same principle — viz., in v. a. and vi. b., in ix. a. and x. b. Here the particular quantification of the positive conclusions disappears in the negative moods. But this is in obedience to the general canon of syllogism, — "That the worst relation subsisting between either extreme and the middle, should subsist between the extremes themselves." For what was the best relation in the former, becomes the worst in the latter; and as affirmation comes in from the greatest whole, while negation goes out from the least part, so, in point of fact, the *some* of the one may become the *not any* of the other. There is here, therefore, manifestly no exception. On the contrary, this affords a striking example of the universal applicability of the canon under every change of circumstances. The canon would, in fact, have been invalidated, had the apparent anomaly not emerged.

| | |
|---|---|
| I. Terms each totally coïnclusive of a third, are totally coinclusive of each other. | a) A term totally coëxclusive, and a term totally coinclusive, of a third, are totally coëxclusive of each other.<br>b) A term totally coinclusive, and a term totally coëxclusive, of a third, are totally coëxclusive of each other. |
| II. Terms each parti-totally coïnclusive of a third, are partially coinclusive of each other. | a) A term parti-totally coëxclusive, and a term parti-totally coinclusive, of a third, are partially coëxclusive of each other.<br>b) A term parti-totally coinclusive, and a term parti-totally coëxclusive, of a third, are partially coëxclusive of each other. |

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[1] See Magentinus (in Brandis, *Scholia*, p. 113, and there the Platonics).

| | |
|---|---|
| III. A term totally, and a term parti-totally, coïnclusive of a third, are toto-partially coïnclusive of each other. | a) A term totally coëxclusive, and a term parti-totally coïnclusive, of a third, are toto-partially coëxclusive of each other.<br>b) A term totally coïnclusive, and a term parti-totally coëxclusive, of a third, are toto-partially coëxclusive of each other. |
| IV. A term parti-totally, and a term totally, coïnclusive of a third, are parti-totally coïnclusive of each other. | a) A term parti-totally coëxclusive, and a term totally coïnclusive, of a third, are parti-totally coëxclusive of each other.<br>b) A term parti-totally coïnclusive, and a term totally coëxclusive, of a third, are parti-totally coëxclusive of each other. |
| V. A term totally, and a term toto-partially, coïnclusive of a third, are parti-totally coïnclusive of each other. | a) A term totally coëxclusive, and a term toto-partially coïnclusive, of a third, are totally coëxclusive of each other.<br>b) A term totally coïnclusive, and a term toto-partially coëxclusive, of a third, are parti-totally coëxclusive of each other. |
| VI. A term toto-partially, and a term totally, coïnclusive of a third, are toto-partially coïnclusive of each other. | a) A term toto-partially coëxclusive, and a term totally coïnclusive, of a third, are toto-partially coëxclusive of each other.<br>b) A term toto-partially coïnclusive, and a term totally coëxclusive, of a third, are totally coëxclusive of each other. |
| VII. A term parti-totally, and a term partially, coïnclusive of a third, are partially coïnclusive of each other. | a) A term parti-totally coëxclusive, and a term partially coïnclusive, of a third, are partially coëxclusive of each other.<br>b) A term parti-totally coïnclusive, and a term partially coëxclusive, of a third, are partially coëxclusive of each other. |
| VIII. A term partially, and a term parti-totally, coïnclusive of a third, are partially coïnclusive of each other. | a) A term partially coëxclusive, and a term parti-totally coïnclusive, of a third, are partially coëxclusive of each other.<br>b) A term partially coïnclusive, and a term parti-totally coëxclusive, of a third, are partially coëxclusive of each other. |

| | |
|---|---|
| IX. A term totally, and a term partially, coïnclusive of a third, are partially coïnclusive of each other. | a) A term totally coëxclusive, and a term partially coïnclusive, of a third, are totally coëxclusive of each other.<br>b) A term totally coinclusive, and a term partially coëxclusive, of a third, are partially coëxclusive of each other. |
| X. A term partially, and a term totally, coïnclusive of a third, are partially coïnclusive of each other. | a) A term partially coëxclusive, and a term totally coinclusive of a third, are partially coëxclusive of each other.<br>b) A term partially coinclusive, and a term totally coëxclusive, of a third, are toto-partially coëxclusive of each other. |
| XI. A term parti-totally, and a term toto-partially, coinclusive of a third, are parti-totally coinclusive of each other. | a) A term parti-totally coëxclusive, and a term toto-partially coinclusive, of a third, are parti-totally coëxclusive of each other.<br>b) A term parti-totally coïnclusive, and a term toto-partially coëxclusive, of a third, are parti-totally coëxclusive of each other. |
| XII. A term toto-partially, and a term parti-totally, coinclusive of a third, are toto-partially coinclusive of each other. | a) A term toto-partially coëxclusive, and a term toto-partially coinclusive, of a third, are toto-partially coëxclusive of each other.<br>b) A term toto-partially coïnclusive, and a term parti-totally coëxclusive, of a third, are toto-partially coëxclusive of each other. |

## VI. — OBJECTIONS TO THE DOCTRINE OF A QUANTIFIED PREDICATE CONSIDERED.

### (a) *GENERAL.*

### MATERIAL AND FORMAL. — THEIR DISTINCTION.

But it is requisite, seeing that there are such misconceptions prevalent on the point, to determine precisely what is the *formal* which lies within the jurisdiction of Logic, and which Logic guarantees, and what the *material* which lies without the domain of Logic, and for which Logic is not responsible. This is fortunately easy.

Logic knows — takes cognizance of — certain general relations; and from these it infers certain others. These, and these alone, it knows and guarantees; and these are formal. Of all beyond these forms or general relations it takes no cognizance, affords no assurance; and only hypothetically says, — If the several notions applied to these forms stand to each other in the relation of these forms, then so and so is the result. But whether these notions are rightly applied, that is, do or do not bear a certain reciprocal dependence, of this Logic, as Logic, knows nothing. Let A B C represent three notions, A containing B, and B containing C; in that case Logic assures us that C is a part of B, and B a part of A; that A contains C; that C is a part of B and A. Now all is formal, the letters being supposed to be mere abstract symbols. But if we apply to them — fill them up by — the three determinate notions, — *Animal*, — *Man*, — *Negro*, we introduce a certain *matter*, of which Logic is not itself cognizant; Logic, therefore, merely says, — If these notions hold to each other the relations represented by A B C, then the same results will follow; but whether they do mutually hold these relations, — that, as *material*, is extra-logical. Logic is, therefore, bound to exhibit a scheme of the forms, that is, of the relations in their immediate and mediate results, which are determined by the mere necessities of thinking, — by the laws of thought as thought; but it is bound to nought beyond this. That, as material, is beyond its jurisdiction However manifest, this has, however, been frequently misunderstood, and the *material* has been currently passed off in Logic as the *formal*.

But further, Logic is bound to exhibit this scheme full and unexclusive. To lop or limit this in conformity to any circumstance extrinsic to the bare conditions, the mere form, of thought, is a material, and, consequently, an illegitimate curtailment. To take, for instance, the aberrations of common language as a model, would be at once absurd in itself, and absurd as inconsistent even with its own practice. And yet this double absurdity the Logic now realized actually commits. For while in principle it avows its allegiance to thought alone, and in part it has overtly repudiated the elisions of language; in part it has accommodated itself to the usages of speech, and this also to the extent from which even Grammar has maintained its freedom. Grammar, the science proper, the nomology, of language, has not established ellipsis as a third law beside Concord and Government; nor has it even allowed Concord or Government to be superseded by ellipsis. And why? Because the law, though not externally expressed in language, was still internally operative in thought. Logic, on the contrary, the science proper, the nomology, of thought, has established an imperative ellipsis of its abstract forms in conformity to the precarious ellipses of outward speech; and this, although it professes to look exclusively to the internal process, and to explicate, — to fill up what is implied, but not stated, in the short cuts of ordinary language. Logic has neglected, — withheld, — in fact openly suppressed, one-half of its forms (the quantification of the predicate universally in affirmatives, particularly in negatives), because these forms, though always operative in thought, were usually passed over as superfluous in the matter of expression.

Thus has Logic, the science of the form, been made hitherto the slave of the matter, of thought, both in what it has received and in what it has rejected. And well has it been punished in its servitude. More than half its value has at once been lost, confusion on the one hand, imperfection on the other, its lot; disgust, contempt, comparative neglect, the consequence. To reform Logic, we must, therefore, restore it to freedom; — emancipate the form from the matter; — we must, 1°, Admit nothing material under the name of formal, and, 2°, Reject nothing formal under the name of material. When this is done, Logic, stripped of its accidental deformity, walks forth in native beauty, simple and complete; easy at once and useful.

It now remains to show that the quantities of the Predicate denounced by logicians are true logical forms.

* * * * * * *

The logicians have taken a distinction, on which they have defended the Aristotelic prohibition of an overt quantification of the predicate; the distinction, to wit, of the *formal*, in opposition to the *material*, — of what proceeds *vi formæ*, in contrast to what proceeds *vi materiæ*. It will be requisite to determine explicitly the meaning and application of these expressions; for every logical process is *formal*, and if the logicians be correct in what they include under the category of *material*, the whole system which I would propose in supplement and correction of theirs must be at once surrendered as untenable.

In the first place, the distinction is not established, in terms at least, by Aristotle. On the contrary, although the propositional and syllogistic relations which he recognizes in his logical precept be all formal, he, as indeed all others, not unfrequently employs some which are only valid, say the logicians, *vi materiæ*, and not *ratione formæ*, that is, in spite of Logic.

But here it is admitted that a distinction there truly is; it is, consequently, only necessary, in the second place, to ascertain its import. What then is meant by these several principles?

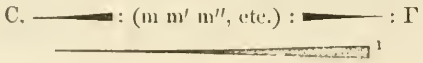
The answer is easy, peremptory, and unambiguous. All that is *formal* is true as consciously necessitated by the laws of thought; all that is *material* is true, not as necessitated by the laws of thought, but as legitimated by the conditions and probabilities discoverable in the objects about which we chance to think. The one is *a priori*, the other *a posteriori;* the one is necessary, the other contingent; the one is known or thought, the other unknown or unthought.

For example: if I think that the notion *triangle* contains the notion *trilateral*, and again that the notion *trilateral* contains the notion *triangle;* in other words, if I think that each of these is inclusively and exclusively applicable to the other; I formally say, and, if I speak as I think, must say — *All triangle is all trilateral.* On the other hand, — if I only think that all triangles are trilateral, but do not think all trilaterals to be triangular, and yet say, — *All triangle is all trilateral*, the proposition, though materially true, is formally false.

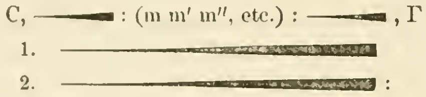
Again, if I think, that this, that, and the other iron-attracting stones are *some* magnets, and yet thereon overtly infer, — *All magnets attract iron;* the inference is formally false, even though materially not untrue. Whereas, if I think that this, that, and the other iron-attracting stones are *all* magnets, and thence conclude, — *All magnets attract iron;* my conclusion is formally true, even should it materially prove false.

To give the former example in an abstract notation: If I note C : ▬▬—— : Γ, I may formally convert the proposition and state Γ : ▬▬—— : C. But if I note C : ▬▬—— Γ, I cannot formally convert it, for the Γ may mean either : Γ or

, Γ; and if I do, the product may or may not be true, according as it is accidentally applied to this or that particular matter. As to the latter example:



This syllogism is formally legitimate. But, to take the following antecedent: this, if formally drawn, warrants only, (1), a particular conclusion; and if, (2), a universal be drawn, such is logically null:



This being the distinction of formal and material, — that what is formally true, is true by a subjective or logical law; — that what is materially true, is true on an objective or extra-logical condition; the logicians, with Aristotle at their head, are exposed to a double accusation of the gravest character. For they are charged: — 1°, That they have excluded, as material, much that is purely formal. 2°, That they have included, as formal, much that is purely material. Of these in their order.

1°, I shall treat of this under the heads of Affirmative and of Negative propositions.

Of the four Affirmative relations of concepts, as subject and predicate; to wit — 1. The *Toto-total;* 2. The *Toto-partial;* 3. The *Parti-Total;* 4. The *Parti-Partial;* one half (1, 3) are arbitrarily excluded from logic. These are, however, relations equally necessary, and equally obtrusive in thought, with the others; and, as formal realities, equally demand a logical statement and consideration. Nay, in this partial proceeding, logicians are not even self-consistent. They allow, for example, the *toto-partial* dependency of notions, and they allow of their conversion. Yet, though the terms, when converted, retain, and must retain, their original relation, that is, their reciprocal quantities; we find the logicians, after Aristotle, declaring that the predicate in affirmative propositions is to be regarded as particular; howbeit, in this instance, where the *toto-partial* is converted into the *parti-total* relation, their rule is manifestly false. When I enounce, — *All man is animal*, I mean, — and the logicians do not gainsay me, — *All man is some animal.* I then convert this, and am allowed to say, — *Some animal is man.* But I am not allowed to say, in words, though I say, indeed must say, in thought, — *Some animal is all man.* And why? Simply because there is an old traditionary rule in Logic which prohibits us in all cases, at least of affirmative propositions, to quantify the predicate universally; and to establish a reason for this exclusion, the principle of materiality has been called in. But if all is formal which is necessitated by thought, and if all that is formal ought to find an expression in Logic, in that case the universal quantification of the notion, when it stands as predicate, may be, ought, indeed, on demand, to be, enounced, no less explicitly than when it stood as

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[1] For an explanation of the notation here employed, in reference to Syllogism, see Appendix XI. — Ed.

subject. The quantification is no more material on the one alternative than on the other; it is formal in both.

In like manner, the *toto-total* relation is denounced. But a similar exposition shows that notions, thought as reciprocating or coëqual, are entitled, as predicate, to have a universal quantification, no less than as subject, and this formally, not materially.[1]

In regard to the four Negative relations of terms, — 1. The *Toto-total*, — 2. The *Toto-partial*, — 3. The *Parti-total*, — 4. The *Parti-partial;* in like manner, one half, but these wholly different classes (3, 4), are capriciously abolished. I say capriciously; for the relations not recognized in Logic are equally real in thought, as those which are exclusively admitted. Why, for example, may I say, as I think, — *Some animal is not any man;* and yet not say, convertibly, as I think, —*Any man is not some animal?* For this no reason, beyond the caprice of logicians, and the elisions of common language, can be assigned. Neither can it be shown, as I may legitimately think, — *Some animal is not some animal* (to take an extreme instance), that I may not formally express the same in the technical language of reasoning.

In these cases, to say nothing of others, the logicians have, therefore, been guilty of extruding from their science much that is purely formal; and this on the untenable plea that what is formal is material.

### (*b*) *SPECIAL.*

Two objections have been taken to the universal quantification of the predicate. It is said to be — 1°, False; 2°, If not false, useless.

I. The first observation may be subdivided into two heads, inasmuch as it may be attempted to establish it, a), on material; b), on formal, grounds. Of these in their order: —

a). This ground seems to be the only one taken by Aristotle, who, on three (perhaps on four) different occasions denounces the universal quantification of the predicate (and he but implicitly limits it to affirmative propositions) as "*always untrue.*"[2] The only proof of this unexclusive denunciation is, however, one special example which he gives of the falsity emerging in the proposition, —*All man is all animal.* This must be at once confessed false; but it is only so materially and contingently, — argues, therefore, nothing for the formal and necessary illegitimacy of such a quantification. As extra-logical, this proof is logically incompetent; for it is only because we happen, through an external knowledge, to be aware of the relations of the concepts, *man* and *animal*, that the example is of any import. But, because the universal quantification of the predicate is, in this instance, materially false, is such quantification, therefore, always formally illegal? That this is not the case, let us take other material examples. Is it, then, materially false and formally incompetent to think and say, —*All human is all rational*, —*All rational is all risible*, —

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[1] It is hardly requisite to notice the blundering doctrine of some authors, that the predicate is materially quantified, even when predesignated as universal. It is sufficient to observe that this opinion is explicitly renounced by the acuter logicians, when they have chanced to notice the absurdity. See Fonseca, *Instit. Dial.* I. vi. c 20.

[2] See p. 546. — Ed.

*All risible is all capable of admiration,* — *All trilateral is all triangular,* — *All triangular is all figure with its angles equal to two right angles*, etc.? Or, employing Aristotle's material example, is it untrue, as he asserts, to say, — *Some animal is all man;* and this either *collectively,* — *A part of the class animal is the whole of the class man,* — or *distributively,* — *Some several animal is every several man?*

But the absurdity of such a reasoning is further shown by the fact, that if it were cogent at all, it would equally conclude against the validity of the universal quantification of the subject. For this proposition is equally untrue (employing always Aristotle's own material example), —*All animal is man.*

After this, it may the less surprise us to find that Aristotle silently abandons his logical canon, and adheres to truth and nature. In fact, he frequently does in practice virtually quantify the predicate, his common reasonings often proceeding on the reciprocation or coëxtension of subject and predicate. Nay, in his logical system, he expressly recognizes this coëxtension; unless, indeed, we overtly supply the quantification of the predicate, his doctrines of Induction and of Demonstration proper have no logical notation; and, unless we covertly suppose it, they are actually arrested. His definitions of the Universal, as severally given in his *Prior* and *Posterior Analytics*, are, in this respect, conflictive. In the former, his universal (known in the schools as the *Universale Prioristicum*) explicitly forbids, whereas the latter (the *Universale Posterioristicum* of the schoolmen) implicitly postulates, the quantification of the predicate.

b). The defect in the polemic of their master was felt by his followers. They, accordingly, in addition to, but with no correction of, Aristotle's doctrine, argue the question on broader ground; and think that they disprove the formal validity of such quantification by the following reasoning. Overlooking the case, where the subject is particularly, the predicate universally, quantified, as in the instance I have just given, they allege the case of what are called *reciprocating propositions*, where both subject and predicate are taken in their utmost extension, *vi materiæ*, as subsequent logicians[1] say, but not Aristotle. In this case, then, as in the example, *All man is all risible*, they assert that the overt quantification of the predicate is inept, because, the *all* as applied to the subject being distributively taken, every individual man, as Socrates, Plato, etc., would be all (that is, the whole class) risible. This objection is only respectable by authority, through the great, the all but unexclusive, number of its allegers; in itself it is futile.

Terms and their quantifications are used either in a distributive, or in a collective, sense. It will not be asserted that any quantification is, *per se*, necessarily collective or necessarily distributive; and it remains to ascertain, by rule and relation, in which signification it is, or may be, employed. Now a general rule or postulate of logic is, — That in the same logical unity (proposition or syllogism), the same term or quantification should not be changed in import.[2] If, therefore, we insist, as insist we ought, that the quantification here, *all*, should be used *in the same proposition in the same meaning*, that is, as applied to the one term, collectively or distributively, it should be so applied likewise to the other, the objection fails. Thus taken *collectively*: — *All* (that is, *the whole class*) *man is all* (that is, *the whole class*) *risible*, the proposition is valid. Again, taken *distributively*: — *All* (that is, *every several*) *man is all* (that is, *every several*) *risible*, the proposition is, in like manner, legitimate. It is only by violating the postulate, — *That in the same logical unity the same sign or word should be used in the same sense*, that the objection applies; whereas, if the postulate be obeyed, the objection is seen to be absurd.

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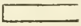
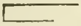
[1] [See, for example, Pacius, *In An. Prior*, L. i. c. 5, p. 134. Alexander, *In An. Prior*, L. i. c. 9, and above, p. 527, note 1, *sub. fin.*]

[2] See p. 512. — Ed.

It is hardly necessary to say anything in confutation of the general doctrine, that in Reciprocating propositions the predicate is taken in its full extent, *vi materiæ*. In the first place, this doctrine was not promulgated by Aristotle; who, frequently allowing, — frequently using, — such propositions, implicitly abandons the rule which he explicitly lays down in regard to the non-predesignation of the predicate by a universal. In the second place, apart from authority, such doctrine is in itself unfounded. For as form is merely the necessity of thought, it is as easy to think two notions as toto-totally coinciding (say, *triangle* and *trilateral*), as two notions toto-partially and parti-totally coinciding (say, *triangle* and *figure*). Accordingly, we can equally abstractly represent their relations both by geometric quantities (lines or figures), and by purely logical symbols. Taking lines: — the former  ; the latter . Taking the symbols, the former C : ▬▬━━━ : Γ; the latter A, ▬▬━━━ : B. But if the reciprocation were determined by the mere matter, by the object contingently thought about, all abstract representation would be impossible. So much for the first objection, — that the universal quantification of the predicate would, at least in affirmative propositions, be false.

II. As to the second objection, that such quantification would be useless and superfluous, disorderly, nay confusive, this only manifests the limited and one-sided view of the objectors, even though Aristotle be at their head.

Is it useless in any case, theoretical or practical, that error be refuted, truth established? And in this case —

1°, Is it disorderly and confusive that the doctrine of *Exponibles*, as they are called, should be brought back from anomaly and pain to ease and order; that propositions Exclusive and Exceptive, now passed over for their difficulty, and heretofore confessedly studied as "opprobria and excruciations," should be shown to be, not merely reducible by a twofold and threefold tortuosity, through eight genera and eight rules, but simple, though misunderstood, manifestations of the universal quantification of the predicate?[1]

2°, Is it useless to demonstrate that every kind of proposition may be converted, and not some only, as maintained by Aristotle and the logicians? And is it disorderly and confusive, in all cases, to abolish the triple (or quadruple) confusion in the triple (or quadruple) processes of Conversion, and to show, that of these processes there is only one legitimate, and that, the one simple of the whole?

3°, Is it disorderly and confusive to abolish the complex confusion of Mood and Figure, with all their array of rules and exceptions, general and special; and thus to recall the science of reasoning to its real unity?

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[1] See p. 517. — Ed.

4°, Is it useless and superfluous to restore to the science the many forms of reasoning which had erroneously, ineffectually, and even inconsistently, been proscribed?

5°, Is it useless or superfluous to prove that all judgment, and, consequently, all reasoning, is simply an equation of its terms, and that the difference of subject and predicate is merely arbitrary?

6°, In fine, and in sum, is it useless or superfluous to vindicate Logic against the one-sided views and errors of logicians, to reconcile the science with truth and nature, and to reëstablish it at once in its amplitude and simplicity?

## VII. — Historical Notices of Doctrine of Quantified Predicate.

### *(a) ARISTOTLE.*

It will be sufficient to make one extract from Aristotle in illustration of his doctrine upon this point, and I select the following passage from his *Categories*, c. v., § 7.

"Further, the primary substances [πρῶται οὐσίαι, — individual existences], — because they are subjects to all the others, and as all the others are predicated of, or exist in, them, — are, for this reason, called *substances* by preëminence. And as the primary substances stand to all the others, so stands the Species to the Genus. *For genera are predicated of species, but not, conversely, species of genera*; so that of these two, the species is more a substance than the genus."

Ammonius, who has nothing in his Commentary on the *Categories* relative to the above passage of Aristotle, states, however, the common doctrine, with its reasons, in the following extract from his Commentary on Porphyry's *Introduction* (f. 29, ed. Ald. 1546).

"But confining ourselves to a logical consideration, it behooves us to inquire, — of these, which are subject to, which predicated of, the others; and to be aware that Genera are predicated of Differences and Species, but not conversely. These, as we have said, stand in a certain mutual order, — the genus, the difference, and the species; the genus first, the species last, the difference in the middle. And the superior must be predicated of the inferior; for to predicate the inferior of the superior is not allowable. If, for example, we say, — *All man is animal*, the proposition is true; but if we convert it, and say, — *All animal is man*, the enouncement is false.[1] Again, if we say, — *All horse is irrational*, we are right; but if conversely we say, — *All irrational is horse*, we are wrong. For it is not allowed us to make a subject of the accidental. Hence it is incompetent to say that *Animal is man*, as previously stated."

[*Categ.* ch. ii., § 1.

"When one thing is predicated of another as of its subject, all that is said [truly] of the predicate will be said [truly] also of the subject. Thus *man* is predicated of this and that man,[1] and *animal* of *man ; animal* will therefore be predicated of this and that individual, for this and that individual is both man and animal."

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[1] The converse of a true proposition is always true; but the false propositions which are here given, as conversions of the true, are not conversions at all. The true propositions, if explicitly stated, are, — *All man is some animal*, and, *All horse is some irrational.* Convert these, — *Some animal is all man*, and, *Some irrational is all horse*; the truth remains, but the one-sided doctrine of the logicians is exploded.

*De Interpret.*, c. vii., § 2–4 ; see also c. x.

"To enounce something of a universal universally, I mean as, *All or every man is white, No man is white*. . . . . . To enounce something of universals not universally, I mean as, *Man is white, Man is not white :* for whilst the term *man* is universal, it is not used in these enouncements as universal. For *all* or *every* (*πᾶς*) does not indicate the universal [itself], but that [it is applied to a subject] universally. Thus, in reference to a universal predicate, to predicate the universal, is not true. For no affirmation is true in which the universal is predicated [of a universal predicate], as, *All or every man is all or every animal*." (See Ammonius, Boethius, Psellus, Magentinus, etc.)

*Prior Analytics*, Bk. I. c. 27, § 9. "The consequent [*i. e.* the predicate] is not to be taken as if it wholly followed [from the antecedent, or subject, exclusively]. I mean, for example, as if *all* [or *every*] *animal* [were consequent] *on man*, or *all* [or *every*] *science on music*. The consequence *simply* [is to be assumed], as in our propositions has been done ; to do otherwise (as to say that *all* [or *every*] *man is all* [or *every*] *animal*, or that *justice is all* [or *every*] *good*), is useless and impossible ; but to the antecedent [or subject] the *all* [or *every*] is prefixed."

*Posterior Analytics*, B. I. c. xii., § 10. "The predicate is not called *all*" [or *every*] ; [that is, the mark of universality is not annexed except to the subject of a proposition].

In refutation of Aristotle's reasoning against the universal predesignation of the predicate — it will equally disprove the universal predesignation of the subject. For it is absurd and impossible to say, *All animal is man ; All (every) immortal is the soul ; All pleasure is health ; All science is music ; All motion is pleasure.*[2] But in point of fact such examples disprove nothing ; for all universal predesignations are applicable neither to subject nor predicate, nor to both *subject* and *predicate* — are *thoughts*, not *things ;* and so are all *predesignations ;* therefore, etc. It is only marvellous that such examples and such reasoning could satisfy the acutest of intellects ; that his authority should have imposed on subsequent logicians is less wonderful.[3]]

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[1] [For the *τίς* here, as elsewhere, denotes the *individuum signatum*, not the *individuum vagum*.]

[2] Examples from Wegelin, *In Greg. Anonymi Comp. Phil. Synt.* L. iv. c. 1, p. 473; L. vi. c. 1, p. 673.

[3] And here I may correct an error, as I conceive it to be, which has descended from the oldest to the most recent interpreters of the *Organon*, and been adopted implicitly by logicians in general. It is found in Alexander and Ammonius, as in Trendelenburg, Saint-Hilaire, and Waitz; nor indeed, as far as I know, has it ever been called in question during the interval. It regards the meaning of the definition elevated into a two-fold axiom, the *esse in toto*, etc., and *dici de omni*, etc., toward the conclusion of the first chapter of the first book of the *Prior Analytics*. *Τὸ δέ ἐν ὅλῳ εἶναι ἕτερον ἑτέρῳ καὶ τὸ κατὰ παντὸς κατηγορεῖσϑαι ϑατερου ϑάτερον ταὐτόν ἐστιν.* This, with its ambiguity, may be thus literally, however awkwardly, translated : — "But [to say] that one thing *is in a whole other*, and [to say] that one thing *is predicated of all another*, are identical." — Now, the question arises, — What does Aristotle here mean by "*a whole other?*" for it may signify either the class or higher notion under which an inferior concept comes,

Quantification of Predicate — Aristotle.

1. Admits that syllogism mental not oral (*An. Post.* I. 10). This to be borne in mind.
2. That individual is never predicated (*Cat.* c. 2), refuted by reciprocation of singular (*An. Pr.* ii. 23, § 4).
3. That affirmative universal not [to] be added to predicate, incompatible with what he says of reciprocation (in *An. Pr.* ii., cc. 22 and 23 *alibi*). That his custom to draw universal conclusions in Third Figure and affirmative in Second[1] with allowance of simple conversion in certain universal affirmatives.
4. That particular not in negative predicate, absurd in *οὐ πας*, *non omnis*.

Aristotle's doctrine of Predesignation.

1°, How can Aristotle, on his doctrine, make universal terms taken indif-

or the inferior concept itself, of which, as of a subject, the higher is predicated. The former is the sense given by all the commentators; the latter, the sense which, I am confident, was intended by Aristotle.

There are only two grounds of interpretation. The rule must be expounded in consistency — 1°, With itself; 2°, Must be with the analogy of Aristotelic usage.

1°. On the former ground, the common doctrine seems untenable; for what Aristotle declares to be identical, by that doctrine becomes different, nay, opposed. An inferior concept may be in a higher whole or class, either partially or totally; and the definition on the prevalent interpretation virtually runs — "To say that one thing is *all or part* in the whole of another, and to say that this other is predicated of it unexclusively, are convertible." Had Aristotle, therefore, used the expression in the signification attributed to him, he must, to avoid the contradiction, have said — *Τὸ δὲ πᾶν ἕτερον ἐν ὅλῳ εἶναι ἑτέρῳ, κ. τ. λ.* ("But to say that one thing is *all* in a whole other," etc.)

2°. On the second ground, it may, however, be answered, that the ambiguity of the word, as it stands, is superseded, its signification being determined by other passages. I join issue; and on this ground am well content to let the question be decided.

In the first place, the meaning I attribute to the expression, "*whole other*" — that is, whole subject or inferior notion — is, in short, in strict conformity with Aristotle's ordinary language. There are, I admit, sundry passages in his logical writings where the term *whole* is clearly used as synonymous with *class*, *or higher notion*; as, to limit ourselves to the *Prior Analytics*, in Book I. iv. § 2; and II. i. § 4. But, *every single text*, in which the term *whole* appears in this relation, is overruled by *more than five others*, in which it is no less clearly applied to denote *the totality of a lower notion*, of which a higher is predicated — passages in which the word *whole* (ὅλος) is used convertibly with *all* (πᾶς). See for example, *An. Pr.* II. ii. § 5, § 16 — iii. § 5, § 7 (*bis*), § 11, § 15 — iv. § 6 (*bis.*), § 8, § 10, § 12 (*bis*) — xxii. § 7, § 8 — xxiii. § 4.

But in the second place (and this is directly subversive of the counter-opinion, even in the principal of the few passages where the term *whole* is used for *class*), the lower notion may be in or under the higher, *only particularly*; and this manifestly shows that Aristotle could not possibly mean, by merely saying that one thing is another, as in a class, that it is so *unexclusively*, or *universally*. Compare *An. Pr.* I. iv. §§ 2, 3, 10. On this interpretation, *Darii* and *Ferio* would then be annulled; a special result which ought to have startled the logicians into a doubt of the accuracy of the received doctrine in general. (See, *instar omnium*, Pacius, in his relative Notes and Commentary.)

That doctrine must, therefore, be abandoned, and the rule, reduced to a definition, read in the following signification: — "But to say that one thing *is in the whole of another*, *as in a subject*, and *to predicate one thing universally of another*, are merely various expressions of the same meaning." This, in fact, is just the preliminary explanation of the two ordinary modes of stating a proposition, subsequently used by Aristotle. Here, in both convertibles, he descends from extension to comprehension, from the predicate to the subject; and the ingenious exposition by the commentators, old and new, of the inverse intention of the philosopher in the two clauses, must be regarded as erroneous.

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[1] See p. 581. — Ed.

ferently, or without predesignation, be tantamount to particulars? (*An. Prior*, I. c. 4, § 13; *Org. Pacii*, p. 135, *alibi*).

2°, *An. Prior*, I c. 27, § 7. He says, as elsewhere, "A proposition being indefinite [preindesignate], it is not clear whether it be universal; when, however, it is definite [predesignate], that is manifest." Contrast this statement with his doctrine of the *all*.

3°, There are syllogisms in Aristotle which are only valid through the quantity of the predicate.[1]

4°, Aristotle requires, though he does not admit, the universal predesignation of the predicate in his syllogism of Induction. (Vide *An. Prior*, L. ii. c. 23, § 4; *Organon Pacii*, p. 399. Compare also his doctrine, p. 396.)

### (b) *ALEXANDER APHRODISIENSIS.*

Alexander Aphrodisiensis, in his commentary on the first book of the *Prior Analytics*, in reference to the second passage of Aristotle, states as follows:

"And in the book of *Enouncement* Aristotle explains why he there says:—'that to predicate the universal of a universal predicate is not true; for there will be no proposition, if in it we predicate the universal of the universal, as, *All man is all animal*.' He repeats the same also here; showing how it is useless to attempt thus to express the consecution [of higher from lower notions]; and adds, that it is not only useless, but impossible. For it is *impossible* that *all men* should be *all animal*, as [*useless to say* (ἄχρηστον εἰπεῖν must have dropt out)], that *all man is all risible*. We must not, therefore, apply the *all* to the subsequent [or predicate], but to that from which it follows [or subject]. For *man* is to be taken universally, as that from which *animal* follows, supposing this to be the consequent of *all man*. Thus shall we obtain a stock of universal propositions. The process is the same in making *man* the consequent on its proper *all*; but *man* is not consequent on *all biped*, but on *all rational*.

"The words, 'as we express ourselves,' mean—as we express ourselves in common usage. For we say, that *all man is* simply *animal*, and not *all animal*, and that *all pleasure is natural*, not *all natural*; prefixing the *all*, not to the consequent, but to the subject from which the predicate follows." (*Edd. Ald.*, f. 100 a; *Junt.*, f. 122 a; compare *Ald.*, f. 86 a; *Junt.*, f. 105 a.)

### (c) *AMMONIUS HERMIÆ.*

Ammonius Hermiæ, *In de Interp.* c. vii. § 2. (Aldine editions, of 1503, sig. C. vii. 59, of 1546, ff. 70, 74.)

"In these words Aristotle inquires,—Whether, as the annexation of the affirmative predesignation (προσδιορισμός) to the subject constitutes one distinct class of propositions, the same annexation to the predicate may not, likewise, constitute another; and he answers, that the supposition is absolutely groundless. Thus the enouncement—*all* (or *every*) *man is all* (or *every*) *animal* (πᾶς ἄνϑρωπος πᾶν ζῶν ἔστι), asserts that *each man is all animal*, as horse, ox, etc

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[1] See p. 581.—Ed.

But this proposition is impossible; as is shown by Aristotle in his here omitting the word 'true.' For no affirmation can be true in which the universal is predicated of a universal predicate; that is, in which the universal predesignate is added to a universal predicate; as when we say that *man* (of whom *all*, or, as he says, universally, *animal* is predicated) is not simply *animal*, but *all animal*. He, therefore, teaches that such an affirmation, as utterly untrue, is utterly incompetent. . . . . .

"Neither does Aristotle allow the predesignation *some* to be annexed to the predicate, that propositions may, thereby, become true always or occasionally. For logicians (as they do not propose to themselves every superfluous variety of enunciation) are prohibited from considering propositions (not only those always true or always false), but those which express no difference in reference to necessary or impossible matter, and afford us absolutely no discrimination of truth from falsehood. Thus, particular propositions, which may be alternatively true and false, ought not to have a predesignated predicate. For in a proposition which has all their power, without any predesignation of its predicate, why should we prefer to the simpler expression that which drags about with it a superfluous additament? Why, for example, instead of — *All man is some animal* [I read, τι ζῶον], or, *All man is not all animal*,[1] should we not say, — *All man is animal*, and in place of *All man is no stone*, not say, — *All man is not stone*: or, what is a simpler and more natural enouncement still, — *No man is stone*!

"And when we find some of the *ancients* teaching that the particular affirmative predesignation is to be connected with the predicate, as when Aristotle himself styles the soul a certain *(some)* entelechy (ἐντελέχειάν τινα), and Plato, rhetoric, a certain *(some)* experience (ἐμπειρίαν τινὰ); it is to be observed that the *some* is there added for the sake of showing, that the predicate is not convertible with the subject, but is its genus, and requires the adding on of certain differences in order to render it the subject's definition.

"But, add they, is not the reasoning of Aristotle refuted by fact itself, seeing that we say, *All man is capable of all science*; thus truly connecting the universal predesignation with the universal predicate? The answer is this: — that, in truth, it is not the predicate to which we here annex the *all*. For what is predicated, is what is said of the subject. But what is here said of man is not that he *is science*, but that he is *capable of science*. If, therefore, the *all* were conjoined with the *capable*, and the proposition then to remain true, as when we say — *all man is all capable of science*: in that case the reasoning of Aristotle would be refuted. But this proposition is necessarily false. It, in fact, asserts nothing less than that of men, each individual is all the kind: — that Socrates is not Socrates only, but also Plato, Alcibiades, and, in short, every other man. For, if *all man is all capable of science*, Socrates being one of the *all*, is, therefore, himself *all capable of science*; so that Socrates will be Plato, Alcibiades, etc., since they also are capable of science. For if

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[1] It will be observed that Ammonius does not attempt an equivalent for this proposition. In fact it is impossible on the common or Aristotelic doctrine; and this impossibility itself ought to have opened his eyes upon the insufficiency of the view he maintained.

Socrates be not, at once, Plato, Alcibiades, etc., neither will he be *all capable of science.*

"Now, that we ought not to prefix the universal affirmative predesignation to the predicate (whether the predicate be more general than the subject, as *All man is all animal*, or whether they be coädequate, as *All man is all risible*), this is manifest from what has been said. Even when the terms are coädequate or reciprocating, the proposition runs into the absurd. For, declaring that *all man is all risible*, it virtually declares that each individual man is identical with all men; that Socrates, in that he is a man, is *all risible*, consequently, *all man*. . . . .

"But why is it that the predicate is intolerant of the predesignation *all*, though this be akin to the counter-predesignation *no* or *none?* Is it because the affirmative predicate, if predicated universally, tends always to contain under it the subject, and this not only when itself coädequate with the subject, but when transcending the subject in extension; while, moreover, through a participation in its proper nature, it is suited to bind up and reduce to unity the multitude of individuals of which the subject is the complement? For, as Aristotle previously observed — 'the *all* does not indicate the universal, but that [the universal predicate inheres in, or is attributed to, the subject] *universally*.' If, therefore, the affirmative predicate thus tend to collect into one what are by nature distracted, in virtue of having been itself previously recognized as simple; in this case, the *all* [superadded to this universal predicate, in fact] enounces not a unity, but a multitude of several things, — things which it is manifestly unable to complicate into reciprocity. But, on the other hand, since what is negatively predicated of, is absolutely separated from, the subject; we are, consequently, enabled to deny of the subject all under the predicate, as in saying, *All man is no stone.* We may indeed condense this proposition, and say more simply, *All man is not stone;* or, more simply still, *No man is stone;* thus dispensing with the affirmative predesignation in a negative proposition."

### (d) *BOETHIUS.*

Boethius, *In Librum de Interpretatione*, editio secunda, et in textum laudatum. *Opera*, p. 348.

"What he says is to this purport: — Every simple proposition consists of two terms. To these there is frequently added a determination either of universality or of particularity; and to which of the two parts these determinations are to be added, he expounds. It appears to Aristotle that the determination ought not to be conjoined to the predicate term; for in this proposition, *Man is animal — (Homo est animal)*, it is inquired whether the determination ought to be coupled with the subject, so that it shall be — *(Omnis homo animal est) — All* (or *every*) *man is animal:* or with the predicate, so that it shall be — *(Homo omne animal est) — Man is all* (or *every*) *animal:* or with both the one and the other, so that it shall be, *All* (or *every*) *man is all* (or *every*) *animal — (Omnis homo omne animal est).* But neither of these latter alternatives is competent. For the determination is never joined to the predicate, but exclusively to the subject; seeing that all predication is either greater than the subject, or equal. Thus in this proposition — *All* (or *every*) *man is animal (omnis homo animal est)*, *animal* [the predicate] is greater than man [the subject]; and, again, in the proposition — *Man is risible* (*homo risibilis est*), *risible* [the predicate] is equated to *man* [the subject]; but that the predicate should be less and narrower than the subject is impossible. Therefore, in those predicates which are greater than the subject, as, for example, where the predication is *animal*, the proposition is manifestly false, if the determination of universality be added to the predicate term. For if we say, *Man is animal* (*homo est animal*), we contract *animal*, which is greater than *man*, by this determination to [an identity of extension with] *man*, the subject, although the predicate, *animal*, may be applied not only to man, but to many other objects. Moreover, in those [subjects and predicates] which are equal, the same occurs; for if I say, *All* (or *every*) *man is all* (or *every*) *risible* (*omnis homo omne risibile est*), — in the first place, in reference to the nature of man itself, it is superfluous to adject the determination; and, again, if it be added to all several men, the proposition becomes false, for when I say, *All* (or *every*) *man is all* (or *every*) *risible*, by this I seem to signify that the several men are [each of them] all or every risible, which is absurd. The determination is, therefore, to be placed not to the predicate but to the subject. But the words of Aristotle are thus reduced to the following import: — *In those predicates which are universal, to add to them aught universal, so that the universal predicate may be predicated universally, is not true.* For this is what he says — "In the case of a universal predicate" (that is, in a proposition which has a universal predicate), "to predicate the universal itself universally, is not true." For in a universal predicate, that is, which is universal and is itself predicated, in this case universally to predicate the predicate which is universal, that is, to adject to it a determination of universality, is not true; for it cannot be that any affirmation should be true in which a universal determination is predicated of a predicate universally distributed; and he illustrates the conception of the matter by the example, "*All or every man is all* (or *every*) *animal* (*omnis homo omne animal est*), of the incompetency of which we have already spoken."

Boethius, *In Librum de Interpretatione*, editio prima. *Opera*, p. 236. (Text so wretchedly printed that the sense must be constituted by the reader.)

[*Aristotle*, c. vii. § 4]. "'In what is predicated as a universal, to predicate the universal universally is not true.'

"In this sentence he instructs us what is the place to which the determination of universality should be rightly added. For he teaches that the universality, which we call the universal determination, is to be connected with the subject term, never with the predicate. For were we to say — *All* (or *every*) *man is animal (omnis homo animal est)*, we should say rightly, annexing the *all* (or *every*) to the subject, that is, to the term *man*. But if we thus speak — *All or every man is all or every animal (omnis homo omne animal est)*, we should speak falsely. He, therefore, does not say this [in the words] — 'in what is predicated as a universal,' as *animal* of *man;* for animal is universal, being predicated of *all* or *every man*. [But he says] — To predicate this universal itself, *animal*, to wit, universally, so that we enounce — *All* (or *every*) *animal is* *man (omne animal esse hominem)*, is not true; for he allows this to be rightly done neither in these nor in any other affirmation.[1] He adds, therefore: — 'For no affirmation will be true in which a universal predicate shall be universally predicated, as *All or every man is all or every animal (omnis homo est omne animal).*'

"Why this happens, I will explain in a few words. The predicate is always greater than the subject, or equal to it. Greater, as when I say, *Man is animal (homo animal est)*; here *animal* is predicated, *man* is subjected, for animal is predicated of more objects than man. Again, it is equal when we thus speak — *Man is risible (homo risibilis est)*; here *man* is the subject, *risible* the predicate. But *man* and *risible* are equal; for it is proper to man to be a risible animal. But that the predicate should be found less than the subject, is impossible. Is the predicate the greater? Then, to adject the universal to the predicate, is *false*, as in the example he himself has given — *All* (or *every*) *man is all* (or *every*) *animal (omnis homo omne animal est).* Is it equal? Then, the adjection is superfluous, as if one should say, *All every man is all or every risible (omnis homo omne risibile est).* Wherefore, to predicate a universal predicate universally is incompetent."

### *(e) AVERROES.*

Averroes, *Perihermenias*, L. I., c. v.

"Propositions are not divided from the conjunction of the predesignation (clausuræ) with the predicate; because the predesignation, when added to the predicate, constitutes a false or a superfluous proposition: — False, as *All or every man is all* (or *every*) *animal (omnis homo est omne animal)*; superfluous, as *All* (or *every*) *man is some* or *a certain animal (omnis homo est quoddam animal).*" Vide Conimbricenses, *In Arist. Dial.* ii. 158.

### *(f) ALBERTUS MAGNUS.*

Albertus Magnus, *Periherminias*, L. I., *Tractatus*, v. c. 1 (*Op.* ed. Lugd. 1651, t. I., p. 261).

["Ly '*omnis*' non est universale, sed signum universalitatis. Quare ly '*omnis*' et hujusmodi signa distributiva non sunt universalia, secundum Avicennam."] Hoc enim signum distributivum, quod est *omnis*, non est universale, proprie loquendo; sed est signum per quod stat pro particularibus universaliter universale, cui tale signum est adjunctum. Causa autem, quare non sit universale, est: — quia, quamvis secundum grammaticum sit nomen appellativum, hoc est, multis secundum naturæ suæ aptitudinem conveniens; tamen est, secundum formam, infinitum, nullam enim naturam unam dicit. Propter quod *omnis* naturæ communis est distributivum. Universale autem est, quod est in multis et de multis, suæ naturæ, suppositis. Ideo *omnis*, et *nullus*, et hujusmodi signa universalia esse non possunt; sed sunt signa designantia utrum universale sit acceptum universaliter vel particulariter, secundum sua supposita. Et hæc sunt verba Avicennæ.

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[1] The Coimbra Jesuits (Sebastianus Contus, 1606) erroneously make Boethius and Averroes oppose Aristotle, "thinking that the sign of universality may be annexed to the predicate of a universal proposition when it is coëxtensive with the subject" (*ad locum* ii., p. 158). This, a mistake, has been copied by their brother Jesuit, P. Vallius, of Rome, in his mighty Logic (*ad locum*). With Boethius he joins Levigersonides; — he means the Rabbi Levi Ben Gerson, of Catalonia, who died at Perpignan in 1370, who wrote on Theology, Philosophy, Mathematics, and Logic. See Jöcher *v. Levi*, from Bartolocci and Wolf.

[" Quare signum universale non sit ponendum a parte prædicati.] In subjecto universali signum distributivum ordinandum: quia per divisionem subjecti, prædicatum partibus attribuitur subjecti, ut divisim participent id per prædicationem, et non in prædicato ponendum: quia quum prædicatum formaliter sit acceptum, non proprie dividitur, nisi alterius, hoc est, subjecti divisione: sed inæqualiter redditur subjecto et partibus ejus. Unde id quod est universale, prædicari potest, ut *Omnis homo est animal;* sed universale universaliter acceptum non potest prædicari: nulla enim vera affirmatio esse potest, in qua de universali aliquo prædicato predicetur sive prædicatio fiat; quoniam universaliter sic patet, quod falsum est, *Omnis homo est omne animal*, et si ponatur, quod *Nullum animal sit nisi homo.* Cum enim *homo* subjiciatur gratia partium suarum, et prædicata formaliter accipiantur, oportet quod *Quilibet homo esset omne animal*, quod falsum est."

### (g) *LEVI BEN GERSON.*

Levi Ben Gerson (or Levi Gersonides), a Jewish philosopher, who died in 1370, at Perpignan, wrote commentaries on Averroes' Commentary upon the logical books of Aristotle. The following is what he says on Averroes' doctrine touching the quantification of the predicate, as it is found (f. 39) of the Venice edition, in folio, of 1552,[1] of the works of Aristotle and Averroes: — "Although it be not necessary that when the quantitative note is attached to the predicate, this should be false or superfluous, seeing that it may be neither, as when we say, *All man is all rational;* and the same holds good in all other reciprocating propositions; — nevertheless, as in certain matters it may so happen, Aristotle has declared that the quantitative note is not to be joined to the predicate in any language. But it may be here objected, that if this be the case, the quantitative note should not be annexed even to the subject, since there *too* it may be either false or superfluous. Superfluous, — as when we say, *Some animal is rational.* For the very same follows here, as if we simply say, *Animal is rational;* the *some*, therefore, is superfluous. False, — as when we say, *All animal is rational.* The reason, therefore, assigned by Aristotle why the quantitative note should not be annexed to the predicate, is futile, seeing that for the same reason it should not be connected with the subject. To this we may answer: That the cause why the quantitative note is not usually conjoined with the predicate, is, that there would thus be two quæsita at once, — to wit, whether the predicate were affirmed of the subject, and, moreover, whether it were denied of everything beside. For when we say, *All man*

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[1] Not in the 8vo edition of these works. Venice, 1560.

*is all rational*, we judge that *all man is rational*, and judge, likewise, that *rational is denied of all but man.* But these are in reality two different quæsita; and therefore it has become usual to state them, not in one, but in two several propositions. And this is self-evident; seeing that a quæsitum, in itself, asks only — Does, or does not, this inhere in that? and not — Does this inhere in that, and, at the same time, inhere in nothing else?"

### (*h*) *THE MASTERS OF LOUVAIN.*

*Facultatis Artium in Academia Lovaniensi Commentaria in Aristotelis Libros de Dialectica* (1535), Tr. iii. c. 1, p. 162, ed. 1547.

Speaking of the text in the *De Interpretatione*, the Masters, *inter alia*, allege: "But if it be even elegantly said by a poet — 'Nemo est omnis homo,' — 'Non omnes omnibus artes' — [proverb, 'Unus homo nullus homo'], why may we not contradict this aptly, howbeit falsely, — 'Aliquis est omnis homo'? Why (they say) do you determine the predicate by the note of universality, seeing that the quantity of the proposition is not to be sought from the predicate, but from the subject? We answer, because we wish to express a certain meaning in words, which by no others can be done. But if the mark of universality could only be employed in changing the quantity of propositions, it would not be lawful to annex it to the part of the predicate. We have, therefore, thought these few cautions requisite to evince that what is condemned by these critics for its folly, is not incontinently sophistical or foolish babbling. But as to the universal rule which Aristotle enounces, — 'No affirmation will be true,' etc., — it is sufficient if it hold good in the majority of cases; whether the predicate exceed the subject, as, *All man is all animal*, — be its equal, as, *All man is all risible*, or its inferior, as, [*Some*] *animal is all man.* In a few cases, however, the exception is valid; as, — *This sun is every sun*, *One phœnix is all phœnix*, and some others. Nor are these futile subtleties, since reason herself approves."

### (*i*) *TITIUS AND RIDIGER.*

The only notice of these speculations of Titius[1] which I have met with in any subsequent philosopher (and I speak from an inspection of several hundred logical systems, principally by Germans), is his friend Ridiger's; who, in his elaborate work, *De Sensu Veri et Falsi*, first published some eight years subsequently (in 1709, but I have only the second edition of 1722), attempts a formal refutation of the heresy of a quantified predicate. It was only, however, after "the most manifest demonstrations of the falsehood of this novel prejudice had been once and again privately communicated to his very learned friend" (Titius?), that Ridiger became at length tired, as he expresses it, "of washing a brick," and laid the polemic before the public. It was not certainly the cogency of this refutation which ought to have thrown the counter opinion into oblivion; but this refutation, such as it is, though with nothing new, is deserving attention, as presenting the most elaborate discussion of the question to be met with, after Ammonius, and in modern times. But the whole argument supposes certain foundations; and it will be sufficient to show that these are false, to dispose of the whole edifice erected upon them. I ought to mention, that it was Ridiger's criticism which first directed my attention to the original of Titius.

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[1] [Titius, *Ars Cogitandi*, c. vi., has the following relative to the quantification of the predicate: — § 36: "Licet autem Propositionum quantitas ex Subjecto æstimetur, attamen Prædicatum non penitus negligendum videbatur, ceu vulgo in hoc tractatione fieri solet, nam et hujus quantitatem observasse utile est, et crediderim et disquisitionis hujus neglectu varios errores tam in doctrina Conversionis, quam Syllogistica esse exortos, quos suis locis videbimus. § 37: Breviter itaque observandum, in propositionibus affirmativis, licet universalibus, prædicatum plerumque esse *particulare*, tribuique subjecto secundum totam quidem suam *comprehensionem*, non vero *extensionem*. § 39: E contrario in propositionibus negativis, licet particularibus, plerumque prædicatum est *universale*, ac tam secundum comprehensionem quam extensionem suam totam, a subjecto removetur § 41, Interim non putarem affirmationem vel negationem ipsam diversam illam prædicati quantitatem necessario postulare, sed crediderim potius, id omne a diverso rerum et idearum habitu oriri, affirmationi vero et negationi prædicati quantitatem esse velut indifferentem. § 42: Nam plerumque prædicata subjectis sunt latiora; quodsi igitur illa cum

"Origo autem hujus erroris neglectus notissimæ aequivocationis signorum *omnis* et *quidam* esse videtur, qua hæc signa, vel *collective* sumi possunt, vel *distributive*. Priori modo, quantitas in prædicato concepta sensum quidem infert non penitus absurdum, cæterum propositionem constituit *identicam et frustraneam*." Ridiger then goes on to a more detailed statement of what he supposes to be the grounds on which the erroneous opinion proceeds.[1]

First Case. — "Verbi gratia, *Quoddam animal est omnis homo;* hoc est, *Species quædam animalis, homo nempe omne id, quod homo est:* quod alium sensum, habere nullum potest, quam, *quod omnis homo sit homo:* sic autem *collective* sumitur et signum subjecti et signum prædicati." This objection is absurd, for it is suicidal; applying equally to the proposition which the objector holds for good, and to that which he assails as bad. *All man is* (*some*) *animal*. Here, is not *animal* or *some animal* just a certain species of animal, and is not this species, *man*, to wit, *all that is man*, and nothing else? There is, consequently, the same tautology in the one case as in the other; and if we are blamed for only virtually saying, by the former, *All man is man*, does the objector say a whit more than this by the latter? Ridiger goes on: "Quodsi vel alterum signum, vel utrumque, *distributive* sumatur, semper absurdus erit propositionis sensus."

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his componas, non poterit non prædicatum particulare inde emergere, dum unice ad subjectum restringi nequit, sed ad alia quoque extendi aptum manet. § 43: Ast si prædicatum a subjecto removeas, universale illud erit, cum quicquid in ejus vel comprehensione vel extensione est ab hoc sejungatur, nec imminuit universalitatem, quod idem ab aliis subjectis quoque removeatur, nam si prædicatum aliis etiam conveniat, tum quidem uni subjecto non potest dici universaliter tributum, verum si de multis negetur, potest nihilominus de certo aliquo subjecto universaliter quoque negari. § 44: Quodsi habitus attributi permittat, poterit aliquando propositio affirmativa prædicatum universale, et negativa particulare habere; nihil enim obstat, quo minus aliquando totum alteri jungere, vel partem ab eodem removere queas. § 45: Hæc itaque propositio: — *Omnis homo est risibilis*, habet prædicatum universale, si risibilitatem pro hominis proprio habeas; sicut hæc, — *Nullus Turca est homo* (Scil. *Christianus*), vel *Quidam medicus non est homo quidam*, prædicatum particulare continent, dum pars solum comprehensionis et extensionis removetur." For the application, by Titius, of the principle of a quantified predicate to the doctrine of Conversion, see above, pp. 528, 529; and to the theory of Syllogism, see below, p. 603, and Appendix, X. — ED.]

[1] Second Edition, pp. 232, 302.

Second Case. — "Verbi gratia, sumatur *utrumque* signum *distributive*, sensus erit, *Quoddam individuum animalis* (v. g. *Petrus*), *est omne individuum hominis* (v. g. *Davus, Oedipus*)." This is a still higher flight of absurdity; for, to refute the proposition, it is first falsely translated into nonsense. Its true meaning, *both* quantified terms being taken *distributively*, is: — *All several men are some several animals*, or, *Every several man is some several animal.*

In these two cases, therefore, all is correct, and the objection from the identity or absurdity of a quantified predicate, null.

Third Case. — "Sumatur signum subjecti *distributive*, signum prædicati *collective*, sensus erit: *Quoddam individuum animalis est universa species hominis.*"

Fourth Case. — "Sumatur, denique, signum subjecti *collective*, signum prædicati *distributive*, sensus erit: *Quædam species animalis, ut universale et prædicabile, est omne individuum hominis.*"

In regard to these last two cases, it is sufficient to refer to what has been already said in answer to Ammonius (p. 549); or simply to recall the postulate, that in the same logical unity (proposition or syllogism) the terms should be supposed in the same sense. If this postulate be obeyed, these two cases are inept, and, consequently, the objections superfluous.

Ridiger then proceeds to treat us with four long "demonstrations *a priori*," and to one elaborate "demonstration *a posteriori*;" but as these are all founded on the blunders now exposed, it would be idle to refute them in detail.

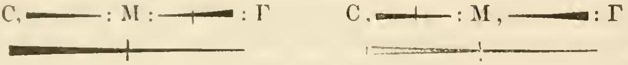
Ridiger, it may well surprise us, howbeit the professed champion of "the old and correct doctrine," is virtually, perhaps unconsciously, a confessor of the truth of "the new and false prejudice;" for I find him propounding four several syllogistic forms, three of which are only valid through the universal quantification of the predicate in affirmatives, and two (including the other one) proceed on a correct, though partial, view, opposed to that of the logicians, touching the conclusion of the Second Figure (L. II. c. iv). I shall insert the quantities, operative but not expressed.

In the First Figure — "At, aut ego nihil video, aut *longe naturalior* est hic processus: — *Quoddam fluidum est* [*quoddam*] *leve; quoddam corpus est* [*omne*] *fluidum; ergo quoddam corpus est quoddam leve*; quam si dicas, etc. (§ 34). — Here the middle term is, and must be, affirmatively distributed as predicate.

C, ———, M : ———, Γ.

In the Second Figure. — "Verbi gratiâ: — *Quoddam ens est* [*omne*] *animal: omnis homo est* [*quoddam*] *animal; ergo, omnis homo est* [*quoddam*] *ens.* Hæc conclusio verissima," etc. (§ 39.) In like manner the middle is here universally quantified in an affirmative. C, ——— : M, ——— : Γ.

The following, Ridiger (p. 330) gives, as "Two new moods, which cannot be dispensed with." — "*Quoddam animal est* [*omnis*] *homo: nullum brutum est* [*ullus*] *homo, ergo, quoddam animal non est* [*ullum*] *brutum.* Item: — *Quoddam animal non est* [*ullus*] *homo, omnis civis est* [*quidam*] *homo; ergo, quoddam animal non est* [*ullus*] *civis.*" In the first of these, the middle, as predicate, is affirmatively distributed; and in both syllogisms, one conclusion, denied by the logicians, is asserted by Ridiger, although the other, which involves a predicate, particular and negative, is recognized by neither.



### (j) GODFREY PLOUCQUET.

Godfrey Ploucquet, a philosopher of some account, Professor of Logic and Metaphysics in the University of Tübingen, by various writings, from the year 1759, endeavored to advance the science of reasoning; and his failure was perhaps owing more to the inadequacy and limitation of his doctrine, than to its positive error. To say nothing about his attempt to reduce Logic to a species of computation, in which his one-sided views came into confliction with the one-sided views of Lambert, he undoubtedly commenced auspiciously, on the principle of a quantified predicate. This, like a few preceding logicians, he certainly saw afforded a mean of simplifying the conversion of propositions;[1] but he did not see that it could accomplish much more, if properly applied, in the theory of syllogism. On the contrary, in syllogistic, he professedly returns, on mature consideration, to the ordinary point of view, and thinks himself successful in recalling the common doctrine of inference to a single canon. That canon is this: — "The terms in the conclusion are to be taken absolutely in the same extension which they hold in the antecedent." — "In conclusione sint termini plane iidem, qui in præmissis, intuitu quantitatis." (*Methodus tam demonstrandi directe omnes syllogismorum species, quam vitia formæ detegendi, ope unius regulæ; — Methodus calculandi in Logicis; passim.* Both in 1763.) This rule, as applied to his logical calculus, he thus enounces: "Arrange the terms in syllogistic order; strike out the middle; and the extremes then afford the conclusion." — "Deleatur in præmissis medius; id quod restat indicat conclusionem." (*Methodus calculandi, passim: Elementa Philosophiæ Contemplativæ, Logica*, § 122, 1778.) This rule is simple enough, but, unfortunately, it is both inadequate and false. Inadequate (and this was always sufficiently apparent); for it does not enable us to ascertain (and these the principal questions) how many terms — of what identity — of what quantity — and of what quality, can be legitimately placed in the antecedent. But it is not true (though this was never signalized); for its peculiar principle is falsified by eight of the thirty-six moods, to wit, in affirmatives, by ix., x., xi., xii., and in negatives, by ix. b, x. a, xi. b, xii. a.[2] In all these, the quantity of an extreme in the conclusion is less than its quantity in the antecedent. We can hardly, therefore, wonder that Ploucquet's logical speculations have been neglected or contemned; although their author be an independent and learned thinker, and his works all well worthy of perusal. But, though dismissed by Hegel and other German logicians, not for its falsity, with supreme contempt, Ploucquet's canon has, however, found its admirers in England, where I have lately seen it promulgated as original.

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[1] An extract from his *Fundamenta Philosophiæ Speculativæ*, 1759, containing Ploucquet's doctrine touching the quantification of the predicate, will be found in Mr. Baynes' *Essay*, p. 128.

[2] See Table of Moods, Appendix XI. — Ed.

*(k) ULRICH.*

*Institutiones Logicæ et Metaphysicæ*, § 171, 1785. — "Non tantum subjecto sed et *prædicato*, ad subjectum relatio, sua constat quantitas, suumque igitur signum quantitatis præfigere licet. Sed hæc prædicati quantitas ex veterum præceptis sæpe justo minor invenitur. In loco de conversione distinctius de eo exponetur." In that place, however, nothing of the kind appears."[1]

# VI.

## CANONS OF SYLLOGISM; GENERAL HISTORICAL NOTICES AND CRITICISM.

### A. — HISTORICAL NOTICES.

### I. — Quotations from Various Logicians.

(Collected and Translated Autumn 1844. See p. 213. — Ed.)

*(a) DAVID DERODON.*

David Derodon (who died at Geneva in 1664, and had been previously Professor of Philosophy at Die, Orange and Nismes) was a logician of no little fame among the French Huguenots; the study of his works was (if I recollect aright) even formally recommended to the brethren of their communion by one of the Gallican Synods. "Either the Devil or Doctor Derodon," was long a proverbial expression in France for the authorship of an acute argument; and the "*Sepulchre of the Mass*" has been translated into the vernacular of every Calvinist country. Derodon has left two systems of Logic;

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[1] [That the Extension of Predicate is always reduced to Extension of Subject, *i. e.*, is equivalent to it, see Purchot, *Instit. Phil.*, *Logica*, i. pp. 123, 125. Tracy, *Elémens d' Idéologie*, t iii. Disc. Prel., pp. 99, 100. Crousaz. *Logique*, t. iii. p. 190. Derodon, *Logica Restituta*, P ii. c. v. art. 4, p. 224. Boethius, *Opera*, p 348 (see above. p. 551). Sergeant, *Method to Science*, b. ii., less. i. p 127 Beneke, *Lehrbuch der Logik*, § 156, p. 100. Stattler, *Logica*, § 196.

That the Predicate has quantity, and potential designation of it as well as the Subject, see Hoffbauer, *Analytic der Urtheile und Schlusse*, § 31 *et seq.* Lambert, *Deutscher Gelehrter Briefwechsel*, Brief vi. vol. i. p 395. Platner, *Philosophische Aphorismen*, i. § 546. Corvinus, *Instit. Phil. Rat.*, § 413. Conimbricenses, *In Arist. Dial.*, t ii. pp. 158, 283. Scotus, *In An. Prior* L. i qu. 4, f. 240; qu. 13, ff. 254b, 255a; qu. 14. f 256b; qu. 23, f. 273a.

For instances of Aristotle virtually using distributed predicate, see *An. Post.*, i. 6, § 1. Cf. Zabarella, *ad loc. Opera Logica*, p. 735. The same, *In An. Post.*, l. 2. *Opera*, p. 827, and *De Quarta Figura Syllog. Op.*, p. 123. The adding mark of universality to predicate is, Aristotle says, "useless and impossible" (*An Prior.*, i. c 27. § 9); yet see ii. c. 22, §§ 7, 8; c. 23. §§ 4. 5. On this question, see Bolzano, *Logik*, § 131, p. 27, (and above, pp. 543, 548, 549.)

That the predesignation of the predicate by *all* collectively, in fact, reduces the universal to a singular proposition, see Purchot, *Instit. Phil.*, i. p. 124. Cf *Logica Contracta Trajectina* P. ii. c. 5. (1707.)]

a larger (*Logica Restituta*, 1659) and a smaller (*Logica Contracta*, 1664), both published in 4to.[1] I shall quote only from the former.

It is impossible to deny Derodon's subtlety, but his blunders unfortunately outweigh his originality. Leaving Conversion as he found it, after repeating, with approbation, the old rules, — that the predicate is not to be overtly quantified universally (p. 573), but to be taken, in affirmative propositions particularly, as in negative propositions universally (p. 623), we are surprised to find him controverting, in detail, the special rules of syllogism. This polemic, as might be expected, is signally unsuccessful; for it is frequently at variance with all principle, and uniformly in contradiction of his own. It is, indeed, only interesting as a manifestation, that the old logical doctrine was obscurely felt by so original a thinker to be erroneous; for the corrections attempted by Derodon are, themselves, especially on the ground which he adopts, only so many errors. He unhappily starts with a blunder; for he gives, as *rectus*, an example of syllogism, in which the middle term is, even of necessity, undistributed; and he goes on (pp. 627, 628, 636, 637, 638, 639, 649) either to stumble in the same fashion, or to adduce reasonings, which can only be vindicated as inferential by supplying a universal quantity to the predicate in affirmative propositions, or by reducing it to particularity in negatives; both in the teeth of Derodon's own laws. I have, however, recorded, in my Table of Syllogisms, some of his examples, both the two forms which he has named, and four others which he only enounces; according, by liberal construction, what was requisite to give them sense, and which, without doubt, the author would himself have recognized.

### (b) RAPIN.

Rapin, *Réflexions sur la Logique*, § 4, 1684.

"Before Aristotle there had appeared nothing on logic systematic and established. His genius, so full of reason and intelligence, penetrated to the recesses of the mind of man, and laid open all its secret workings in the accurate analysis which he made of its operations. The depths of human thought had not as yet been fathomed. Aristotle was the first who discovered the new way of attaining to science, by the evidence of demonstration, and of proceeding geometrically to demonstration, by the infallibility of the syllogism, the most accomplished work and mightiest effort of the human mind," etc.

Rapin errs in making Aristotle lay the rule of proportion along with the *Dictum de Omni* as a principle of Syllogism.

### (c) LEIBNITZ.

Leibnitz, *De la conformité de la Foi avec la Raison*, § 22. *Op.* t. i., p. 81.

"Hence the facility of some writers is too great, in conceding that the doctrine of the Holy Trinity is repugnant with that great principle which enounces — *What are the same with the same third, are the same with each other;* that is, if A be the same with B, and C be the same with B, it is necessary that A and C should also be the same with one another. For this principle flows immediately from the principle of Contradiction, and is the ground and basis of all Logic; if that fail, there is no longer any way of reasoning with certainty."

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[1] Derodon seems wholly unknown to the German logicians, and, I need hardly add, to those of other countries. In Scotland, his works are not of the rarest; a considerable number in the same binding must have been imported at once, probably in consequence of the synodical recommendation.

### (d) *REUSCH.*

Reusch, *Systema Logicum*, 1734.

§ 506. "That dictum of the Aristotelians *de Omni et Nullo* (503) evinces, indeed, a legitimate consequence, but it only regulates one species of syllogisms, at least immediately. By this reason, therefore, logicians have been induced to prove the consequence of the other species by means of the first, to which they are reduced. But, that we may be able to supersede this labor, I have endeavored to give a broader basis to the Dictum de Omni et Nullo, or by whatever name that rule is called, to which, in the construction of syllogisms, the order of thought is conformed.

§ 507. "For the whole business of ordinary reasoning is accomplished by the substitution of ideas in place of the subject or predicate of the fundamental proposition. This some call the *equation of thoughts.* Now, the fundamental proposition may be either affirmative or negative, and in each the ideas of the terms may be considered either agreeing or diverse, and according to this various relation there obtains a various substitution, which we shall clearly illustrate before engaging with our doctrine of the Dictum de Omni et Nullo." [Having done this at great length, he proceeds.]

§ 510. "From what has been now fully declared, the following Dictum de Omni et Nullo may be formed, which the definition itself of reasoning and syllogism (§ 502) supports, and to which all syllogisms in every figure and mood may be accommodated.

"*If two ideas* (two terms) *have, through a judgment* (proposition), *received a relation to each other, either affirmative or negative, in that case it is allowable, in place of either of these* (that is, the subject or predicate of that judgment or proposition), *to substitute another idea* (term), *according to the rules given of Equipollence or Reciprocation* (§ 508, s. 9), *of Subordination, of Coördination.*" (See Waldin, below, p. 565.)

### (e) *CRUSIUS.*

Crusius, *Weg zur Gewissheit.* Ed. i. 1747; Ed. ii. 1762.

§ 256. "The supreme law of all syllogism is, *What we cannot otherwise think than as true, is true, and what we absolutely cannot think at all, or cannot think but as false, is false.*"[1]

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[1] Kant (*Über die Evidenz in metaphysischen Wissenchaften*, 1763, *Verm. Schrift.* ii. 43) has hereon the following observation: — "In regard to the supreme rule of all certainty which this celebrated man thought of placing as the principle of all knowledge, and, conse-

§ 259. Of necessary judgments, of judgments which we cannot but think, "which are not identical, and which constitute, in the last result, the positive or the kernel in our knowledge; to which we apply the principle of Contradiction, and thereby enrich the understanding with a knowledge of real judgments," — such judgments are principally the following: *Every power or force is inherent in a subject: All that arises* (begins to be), *arises in virtue of a sufficient cause: All whose non-existence cannot be thought, has its cause, and has at some time arisen* (begun to be); *Every substance exists somewhere; All that exists, exists at some time; Two material things cannot exist at the same time, and in precisely the same place.* There are also many other propositions, which treat of the determinate qualification of things as present; for example — *The same point of a body cannot be at once red and green; A man cannot be in two places at once*, and so forth.

§ 261. "All the judgments previously alleged (§ 259) may be comprehended under these two general propositions, — *What cannot in thought be separated from each other, cannot be separated from each other in reality:* and, *What cannot in thought be connected into a notion, cannot in reality be connected:* to wit, although no contradiction shows itself between the notions, but we are only conscious of a physical necessity to think the thing so and so, clearly and after a comparison of all the circumstances with each other. For we now speak of propositions which are not identical with the Principle of Contradiction, but of such as primarily afford the matters on which it may be applied. Hence we see that the supreme principle of our knowledge given above (§ 256) has two determinations; inasmuch as the impossibility to think a something arises either because a contradiction would ensue, or because we are positively so compelled by the physical constitution of our thinking faculties.

§ 262. "The highest principle of all syllogism thus resolves itself into the three capital propositions:

1. *Nothing can at once be and not be in the same point of view.*

2. *Things which cannot be thought without each other, without each other cannot exist.*

3. *What cannot be thought as with and beside each other, cannot exist with and beside each other, on the supposition even that between the notions there is no contradiction.*

"The second of these capital propositions I call the *Principle of Inseparables (principium inseparabilium):* and the third the *Principle of Inconjoinables (principium inconjungibilium).* They may be also termed the three *Principles of Reason.*"

Ch. VIII. *Of the different species of syllogisms*, he says (§ 272), "Among

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quently, also of the metaphysical, — *What I cannot otherwise think than as true, is true*, etc; it is manifest that this proposition can never be a principle of truth for any knowledge whatever. For if it be agreed that no other principle of truth is possible than inasmuch as we are incapable of holding a thing not for true, in this case it is acknowledged that no other principle of truth is competent, and that knowledge is indemonstrable. It is indeed true that there are many indemonstrable knowledges, but the feeling of conviction in regard to them is a confession, but not a ground of proof, that they are true." See also Reid, *Intellectual Powers, Essay* iv. ch. 4.

the higher principles of syllogisms it is needful only to enumerate the *Principle of Contradiction*, and the *Principle of Sufficient Reason*, which is subsumed from the principle of Inseparables (§ 262). We shall state the laws of syllogism in this order, — Consider those which flow, 1°, From the *Principle of Contradiction ;* 2°, From the *Principle of Sufficient Reason ;* and, 3°, From both together."

### (*f*) *FRANCIS HUTCHESON.*

[Francisci Hutcheson.] *Logicæ Compendium. Glasguæ, in ædibus academicis, excudebant Robertus et Andreas Foulis, Academiæ Typographi.* 1764.

Part III., Ch. ii., p. 58.

"The whole force of syllogism may be explicated from the following axioms.

"First Axiom. — *Things which agree in the same third, agree among themselves.*

"Second Axiom. — *Things whereof the one agrees, the other does not agree, in one and the same third, these things do not agree among themselves.*

"Third Axiom. — *Things which agree in no third, do not agree among themselves.*

"Fourth Axiom.— *Things which disagree in no third, do not disagree among themselves.*"

"Hence are deduced the general rules of syllogisms.

"Of these the three first regard the *Quality* [not alone] *of Propositions.*

"Rule 1. — *If one of the premises be negative, the conclusion will be negative* (by Ax. 2).

"Rule 2. — *If both premises be affirmative, the conclusion will be affirmative* (by Ax. 1).

"Rule 3. — *If both premises be negative, nothing follows :* because, of things mutually agreeing and mutually disagreeing, both may be different from a third thing (by Ax. 3, 4).

"Two Rules regard the *Quantity of Terms.*

"Rule 4. — *Let the middle be once at least distributed, or taken universally :* for the common term frequently contains two or more species mutually opposed, of which it may be predicated according to various parts of its extension ; these [specific] terms do not, therefore, truly agree in one third, unless one at least of them agrees with the whole middle (by Ax. 3, 4).

"Rule 5. — *No term ought to be taken more universally in the conclusion than in the premises :* because no consequence is valid from the particular to the universal. [Because we should, in that case, transcend the agreement or disagreement of the two terms in a third, on which, *ex hypothesi*, we found.]

"[In like manner there are two rules] concerning the *Quantity of Propositions.*

"Rule 6. — *If one of the premises be particular, the conclusion will also be particular.*

"For, Case I. — If the conclusion be affirmative, therefore both premises will be affirmative (by Rule 1). But, in a particular proposition, there is no term distributed ; the middle is, therefore, to be distributed in one or other of the premises (by Rule 4). It will, therefore, be the subject of a universal affirmative proposition ; but the other extreme is also taken particularly, when it is the predicate of an affirmative proposition, the conclusion will, therefore, be particular (by Rule 5).

"Case II. — Let the conclusion be negative; its predicate is, therefore, distributed: hence, in the premises, the major and the middle terms are to be distributed (by Rules 5 and 4).

"But when one of the premises is negative, the other is affirmative (by Rule 3). If one premise be particular, these two terms only can be distributed; since one premise affirms, whilst the other is particular. The minor extreme, the subject of the conclusion, is not, therefore, distributed in the premises; it cannot, therefore (by Rule 5), be distributed in the conclusion.

"Rule 7. — *From two particular premises nothing follows;* at least according to the accustomed mode of speaking, where the predicate of a negative proposition is understood to be distributed. For, 1°, If the conclusion affirm, both premises will affirm, and, consequently, no term is distributed in the premises; contrary to Rule 4. 2°, Let the conclusion be negative, its predicate is therefore distributed; but in particular premises there is only distributed the predicate of a negative proposition; there is, therefore, necessarily a vice (either against Rule 4 or Rule 5)."[1]

### (g) SAVONAROLA.

Savonarola, *Compendium Logices*, L. iv. p. 115, ed. *Venetiis*, 1542. — "In whatever syllogism any proposition can be concluded, there may also be concluded every other proposition which follows out from it." On this he remarks: "When any syllogism infers a conclusion flowing from its immediate conclusion, it is not to be called *one* syllogism, but *two*. For that other conclusion does not follow simply in virtue of the premises, but in virtue of them there first follows the proper conclusion, and from this conclusion there follows, by another syllogism, the conclusion consequent on it. Hence there are tacitly two syllogisms; otherwise the moods of syllogisms would be almost infinite."

### (h) BAUMGARTEN.

Baumgarten, *Acroasis Logica* Ed. Töllner. Ed. I. 1765.

§ 297. "Every reasoning depends on this proposition: — A *and* B *connected*

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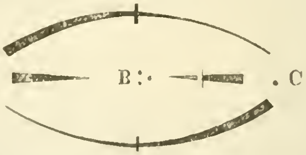
[1] "Rules 1 and 7 are thus contracted into one: *The conclusion follows the weaker part;* that is, the negative or the particular. All these Rules are included in the following verses:

Distribuas medium, nec quartus terminus adsit,
Utraque nec præmissa negans, nec particularis.
Sectetur partem conclusio deteriorem;
Et non distribuat nisi cum præmissa, negetve.

In an unusual mode of speaking, a certain negative conclusion may be effected with a non-distributive predicate. As in this example:

A B
*Some Frenchmen are [some] learned;*
C B
*Some Englishmen are not [any] learned; Therefore, some Englishmen are not some Frenchmen."*



(What are within [ ] are by me). [Written Autumn 1844. In the latest notation (,) is substituted for (.), and (:) for (:,). See Appendix XI. — Ed.]

*with a third* C, *are connected with each other:* in affirmation immediately, in negation mediately. This proposition is, therefore, the foundation and principle of all reasoning; which, however, is subordinate to the principle of Contradiction.

§ 324. "Every ordinary syllogism concluding according to the *Dictum*, either *de Omni*, or *de Nullo.* This *Dictum* is thus the foundation of all ordinary syllogisms." (It had been previously announced, §§ 319, 321.)

"Whatever is truly affirmed of a notion universally, is also truly affirmed of all that is contained under it. Whatever is truly denied of a notion universally, is also truly denied of all that is contained under it."

### *(i) REIMARUS.*

Reimarus, *Vernunftlehre.* 1766.

§ 176. "The fundamental rules of syllogism are, consequently, no other than the rules of *Agreement* [Identity] and of *Contradiction.* For what the geometer in regard to magnitudes takes as the rule of equality or inequality, that the reasoner here adopts as the universal rule of all mediate insight: — *If two things be identical with a third, they are also in so far identical with each other. But if the one be, and the other be not, identical with the third, then they are not mutually identical, but rather mutually repugnant.*"

§ 177. Here he notices that the *Dictum de Omni et Nullo* is not properly a rule for all figures, but for the first alone.

### *(j) WALDIN.*

Waldin, *Novum Logicæ Systema.* 1766.

§ 335. "Since the syllogism requires essentially nothing but a distinct cognition of the sufficient reason of some proposition, the most universal rule of all syllogisms is, — *The sufficient reason of a given proposition is to be distinctly cognized.*

§ 364. "The most general rule of all reasonings (§ 335) remains also the rule of all reasonings as well in synthesis as in analysis. But in the synthesis of the ordinary syllogism the middle term in the major proposition is referred to the major term, in the minor proposition to the minor term. (§ 360.) Wherefore, from this relation we must judge whether the middle term be or be not the sufficient reason of the conclusion. Wherefore, the synthesis of the ordinary syllogism is to be cognized from the relation of its ideas. This you may thus express:

"1.) *After the true proposition, the relation of whose extremes you distinctly apprehend;*

"2.) *Add to its subject or predicate another idea different from both, whether agreeing or disagreeing;*

"3.) *Inquire into the relation of the added idea, to the end that you may know whether the middle term in the given relation infer the conclusion; and this is known by the application of the rules of Reciprocation, Subordination, Coördination, and Opposition.* If any one wish to call this the *Dictum de Omni et Nullo* I have no objections."

"*Observation.*—This they call the *Dictum de Omni et Nullo* of the celebrated Reusch. It stands true indeed, but is beset with difficulties, inasmuch as it is rather a complexus of all rules than one only, which as yet is to be referred to the class of *pia desideria*. Logicians have, indeed, taken pains to discover one supreme rule of all ordinary reasonings; but no one has as yet been so happy as to find it out." Then follows a criticism of the attempts by the Port Royal and Syrbius.

### (k) STATTLER.

Stattler, *Philosophia*, P. I. *Logica*, 1769.

§ 237. "In this comparison of two ideas with a third, six different cases may in all occur: for, either,

1.) "*One of the two ideas contains that same third, which again contains the other*: or,

2.) "*Both of the two are contained in the third*; or,

3.) "*Each of the two contains the third*; or,

4.) "*One of the two contains the third, the other being repugnant with it*; or,

5.) "*One of the two is contained in the third, with which the other is repugnant*; or,

6.) "*Both of the two are repugnant to the third.*

"The former three cases generate an affirmative conclusion, the latter three a negative." In a note Stattler eliminates a seventh case, in which neither may contain, and neither be repugnant to the third.

§ 244. General Law of all Reasonings. "*In all reasonings, as often as a consequent is, by legitimate form, inferred from an antecedent, so often is there included in the antecedent what the consequent enounces; either the congruity and reciprocal containment, or the repugnance of* A *and* C: *and if such be not included in one or other of the antecedents, whatever is inferred in the consequent is void of legitimate form.*"

### (l) SAUTER.

Sauter, *Institutiones Logicæ*, 1798.

§ 123. "*Foundations of Syllogism.* — In every syllogism there are two notions compared with a third, to the end that it may appear whether they are to be conjoined or sejoined. There are, therefore, here, three possible cases. For there *agree* with the assumed third, either *both* notions, or *one*, or *neither*. In reasoning, our mind, therefore, reposes on these axioms, as on fundamental principles.

1.) "*Where two notions agree with the same third, they agree with one another.*

2.) '*Where one is contained by the third, with which the other is repugnant, they are mutually repugnant.*

3.) "*When neither notion agrees with the third, there is between them neither agreement nor repugnance.*"

### (m) SUTER.

Suter, *Logica*.

§ 61. "Quæ eidem tertio conveniunt vel disconveniunt, etiam conveniunt vel disconveniunt inter se."

### (n) SEGUY.

Seguy, *Philosophia ad Usum Scholarum Accommodata*, T. I. *Logica*. Paris, 1771.

P. 175, ed. 1785. "Concerning the rule of recent philosophers."

Having recited the general rule of the *Port Royal Logic*, he thus comments on it:

"1°, This is nothing else than the principle of reasoning; therefore, it is improperly adduced as a new discovery, or a rule strictly so called.

"2°, It may be useful, to the rude and inexperienced, to recognize whether a syllogism be legitimate or illicit.

"But the principal fault of this rule is, that it contains no certain method whereby we may know when, and when not, one of the premises contains a conclusion; for the discovery of which we must frequently recur to the general rules."[1]

P. 178. Seguy exposes Father Buffier's error in saying, "that, according to Aristotle and the common rules of Logic, the middle term ought absolutely to be the predicate in the first or major proposition;" seeing that the middle term is not the predicate in the first and third Figures. This must be a mistake; for I cannot find such a doctrine in Buffier, who, in this respect, in many places teaches the correct.

### (o) HOFFBAUER.

Hoffbauer, *Anfangsgründe der Logik*, 1794, 1810.

"§ 317. *Fundamental Principles*.

"I. 1.) An attribute which belongs to all and every of the objects contained under a notion, may also be affirmed of these objects so contained. (Dictum de Omni.)

"2.) An attribute which belongs to none of the objects contained under a notion, must also be denied of these objects so contained. (Dictum de Nullo.)

"II. When, of the objects X and Z, the one contains an attribute which the other does not contain, and they are thus different from each other, then X is not Z, and Z is not X.

"III. 1.) When objects which are contained under a notion *a* are also contained under another notion *b*, then this last notion contains under it some at least of the objects which are contained under the first.

"2.) If certain objects which are not contained under a notion *a* are contained under *b*, then *b* contains under it some at least of the objects which are not contained under *a*.

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[1] Followed by Larroque, *Elémens de Philosophie*, p. 231; Galluppi, *Lezioni di Logica e di Metafisica*, l. 47, i. 348. *E contra*, *Philosophia Lugdunensis*, i. 159. Troxler, *Logik*, ii. 41.

"IV. 1.) If objects which are contained under a notion *a* belong to those which are contained under another notion *b*, then this second notion *b* contains under it some at least of the objects which are contained under *a*.

"2.) If all objects which are contained under a notion *a* belong to those which are not contained under a certain other notion *b*, then this notion *b* contains under it no object which is contained under the notion *a*.

"3.) If all the objects contained under a certain notion *a* are different from certain other objects contained under *b*, then *b* contains under it at least some objects which are not contained under *a*."

### (*v*) KANT.

Kant, *Logik*. 1800–6. II. Syllogisms.

"§ 56. *Syllogism in General.* — A syllogism is the cognition that a certain proposition is necessary, through the subsumption of its condition under a given general rule.

"§ 57. *General principle of all Syllogisms.* — The general principle whereon the validity of all inference, through the reason, rests, may be determinately enounced in the following formula:

"*What stands under the condition of a rule, that stands also under the rule itself.*

"*Observation.* — The syllogism premises a *General Rule*, and a *Subsumption* under its *Condition*. Hereby we understand the conclusion *a priori*, not as manifested in things individual, but as universally maintained, and as necessary under a certain condition. And this, that all stands under the universal, and is determinable in universal laws, is the Principle itself of *Rationality* or of *Necessity (principium rationalitatis seu necessitatis)*.

"§ 58. *Essential constituents of the Syllogism.* — To every syllogism there belong the three following parts:

"1.) A general rule, styled the *Major proposition (propositio major, Obersatz)*.

"2.) The proposition which subsumes a cognition under the condition of the general rule, called the *Minor proposition (propositio minor, Untersatz)*; and, finally,

"3.) The proposition which affirms or denies the predicate in the rule of the subsumed cognition, — the *Concluding proposition*, or *Conclusion (Conclusio, Schlussatz)*.

"The two first propositions, taken in connection with each other, are called the *Antecedents*, or *Premises (Vordersätze)*.

"*Observation.* — A rule is the assertion of a general condition. The relation of the condition to the assertion, how, to wit, this stands under that, is the *Exponent* of the rule. The cognition, that the condition (somewhere or other) takes place, is the *Subsumption*.

"The nexus of what is subsumed under the condition, with the assertion of the rule, is the *Conclusion*."

Having shown the distribution of syllogisms into *Categorical*, *Hypothetical*, and *Disjunctive*, he proceeds to speak of the first class.

"§ 63. *Principle of Categorical Syllogisms.* — The principle whereon the possibility and validity of Categorical Syllogisms is this, — What pertains to the attribute of a thing, that pertains to the thing itself; and what is repugnant to the attribute of a thing, that is repugnant to the thing itself *(Nota notæ est nota rei ipsius ; Repugnans notæ, repugnat rei ipsi).*

"*Observation.* — From this principle, the so-called Dictum de Omni et Nullo is easily deduced, and cannot, therefore, be regarded as the highest principle either of the Syllogism in general, or of the Categorical Syllogism in particular. *Generic and Specific Notions* are in fact the general notes or attributes of all the things which stand under these notions. Consequently the rule is here valid — *What pertains or is repugnant to the genus or species, that also pertains or is repugnant to all the objects which are contained under that genus or species.* And this very rule it is which is called the Dictum de Omni et Nullo."

### (q) CHRISTIAN WEISS.

Christian Weiss, *Logik*, 1801.

"§ 216. *Principle for all Syllogisms.* — The principle of every perfect Syllogism consists in *the relation of one of the notions contained in the conclusion to a third notion (terminus medius), to which the other notion of the conclusion belongs. Now the relation which the first of these holds to the middle notion, the same must hold to the second, just because the second coincides with the middle notion to the same extent as the first.*

"*Remark.* — '*Relation to*' means only any determinately thought relation expressed in a judgment. . . . .

"The older logicians adopt, some of them, the principle *Nota notæ est nota rei ipsius, — quod repugnat notæ, repugnat ipsi rei ;* this, however, is only properly applicable to the first figure. The expression of others is preferable, *Quæcumque conveniunt (vel dissentiunt) in uno tertio, eadem conveniunt (vel dissentiunt) inter se.* Others, in fine, among whom is Wolf, give the Dictum de Omni et Nullo (cf. § 233) as the principle of syllogisms in general ; compare *Philosophical Aphorisms* [of Platner], P. i. § 546. All inference takes place according to a universal rule of reason, here only expressed in reference to syllogism, to which, however, some have chosen to give a more mathematical expression : — *If two notions be equal to a third, they are also equal to each other.*

[*Nota bene.* — Weiss's mistake (§ 231) in supposing that Aristotle "designated the syllogistic moods with words, like his learned followers."]

"§ 231. Categorical Syllogisms, Figure I. — The first figure concludes by means of a subordination of the minor term in the conclusion under the subject of another judgment.

"§ 233. This takes place under the general principle :

"1.) *What pertains to all objects contained under a notion, that pertains also to some and to each individual of their number among them.*

"2.) *What belongs to none of the objects contained under a notion, that also does not pertain to some or to any individual of their number among them.*

"These are the celebrated Dicta de Omni and de Nullo, — *Quidquid præ-*

*dicatur de omni, idem etiam de aliquo*, and, *Quidquid prædicatur de nullo, id nec de aliquo prædicatur.*"

### (r) FRIES.

Fries, *System der Logik.*

"§ 52. Hitherto we have maintained two views of the Syllogism in connection. The end in view of reasoning is this, — that cases should be subordinated to general rules, and through them become determined. For example, the general law of the mutual attraction of all heavenly bodies has its whole significance, for my knowledge, in this, that there are given individual heavenly bodies, as Sun and Earth, to which I apply it. To enounce these relations, it is, in the first place, necessary that I have a general rule, as Major Proposition (Obersatz); in the second, a Minor Proposition (Untersatz), which subordinates cases to the rule; and, finally, a Concluding Proposition, which determines the cases through the rule. On the other hand, we see that every Conclusion is an analytico-hypothetic judgment, and this always flows from the Dictum de Omni et Nullo, inasmuch as the relation of subordination of particular under universal notions, is the only relation of Reason and Consequent given in the form of thought itself. Now, if the conclusion, as syllogism, combines a plurality of judgments in its premises, in this case the principle of the inference must lie in a connection of the thoughts, — a connection which is determined by the matter of these judgments. In the simplest case, when taking into account only a single syllogism, I thus would recognize in the premises the relation of subordination between two notions by reference to the same third notion, and therethrough perceive in the conclusion the relation of these two notions to each other. I know, for example, that *all men are mortal*, and that *Caius is a man*. Consequently, through the relation of the notion of *mortality*, and of my imagination of *Caius*, to the notion *man*, the relation of *Caius* to *mortality* is likewise determined: — *Caius is mortal.* The first of these views is a mere postulate; but in conformity to the second we are enabled immediately to evolve the general form of syllogisms, and from this evolution does it then become manifest that all possible syllogisms satisfy the postulate. We, therefore, in the first instance, attach ourselves to the second view. Through this there is determined as follows:

"1.) Here the determination of one notion is carried over to another, superordinate or subordinate to itself. To every syllogism there belong three notions, called its *terms (termini)*. (We say *notions (Begriff)*, because they are, in general. such, and when individual representations [or images] appear as terms, in that case there is no inter-commutation possible.) A *major term*, or *superior notion (Oberbegriff)*, P, is given as the logical determination of a *middle term* or *notion (Mittelbegriff)*, M, and, through this, it is positively or negatively stated as the determination of a *minor term* or *notion (Unterbegriff)*, S.

"2.) If, then, we regard the propositions in which these relations are enounced, there is, firstly, in the *conclusion (Schlussatz)*, the minor term, or inferior notion, subordinated to the major term, or superior notion (S *is* P). Further, in one of the premises, the middle must be connected with the major term or notion (M *is* P). This is called the *major proposition (Obersatz)*. In the other, again, the minor is connected with the major term or notion (S *is* M); this is called the *minor proposition (Untersatz).*

"The form of every syllogism is therefore —

Major Proposition, M *is* P.
Minor Proposition, S *is* M.

Conclusion, S *is* P.

"In the example given above, *man* is the middle term; *mortality* the major term; and *Caius* the minor term. The syllogism is —

Major Proposition, *All men are mortal;*
Minor Proposition, *Caius is a man;*

Conclusion, *Caius is mortal.*

"The fundamental relation in all syllogisms is that of the middle term to the major and minor terms; in other words, that of the carrying over of a logical determination from one notion to another, through certain given subordinations. For, howbeit the Dictum de Omni et Nullo, as a common principle of all syllogisms in the formula, — *What holds good of the universal, holds also good of the particulars subordinate thereto*, and still more in that other, — *The attribute of the attribute is also the attribute of the thing itself*, — is proximately only applicable to the categorical subordination of a representation [or notion] under a notion; still, however, the law of mental connection is altogether the same in syllogisms determined by the subordination of consequence under a reason [Hypothetic Syllogisms], or of the complement of parts under a logical whole [Disjunctive Syllogisms]. The displayed form is the form of every possible syllogism. In fact, it also coincides with the first requirement that, in the syllogism, a case should always be determined by a rule, inasmuch as every syllogism proposes a universal premise, in order rigorously to infer its conclusion. This will be more definitely shown when we treat of syllogisms in detail. Only the declaration, *that the rule is always the major proposition*, is sometimes at variance with the declaration, *that the major proposition contains the relation of the middle term to the major term.* We must, however, in the first place, always follow the determination of the latter. For every syllogism properly contains the three processes: — 1). The subordination of a particular under a universal; this is the function of the minor proposition, and the relation between the minor and major terms; 2). Postulate of a logical determination for one of these two; this is the function of the major proposition, and the relation of the middle to the major term; 3). The carrying over this determination to that other; this is the function of the conclusion and the relation of the minor to the major terms.

"§ 53. The subordination of a particular to a universal must, therefore, in every syllogism, be understood wholly in general. Here either a particular may be determined through the superordinated universal, and such an inference from universal to particular we shall call a *syllogism in the first figure;* or there is a universal known through its subordinated particular, and this inference from the particular to the universal is called *a syllogism in the second* [*third*] *figure.* If, for example, the subordination is given me, — *All gold is* *metal;* I can either transfer an attribute of metal, for instance *fusibility*, to the gold, or enounce an attribute of gold, *ductility*, for instance, of some metal. In the first case, I draw a conclusion in the first figure, from the universal to the particular:

*All metal is fusible;*
*All gold is metal;*
———
*All gold is fusible.*

"In the other case, I conclude in the second [third] figure from the particular to the general:

*All gold is ductile;*
*All gold is metal;*
———
*Some metal is ductile.*"

Then, after distribution of the Syllogism into Categorical, Hypothetical, and Divisive (Disjunctive), he proceeds with the first class.

### *(s) KIESEWETTER.*

Kiesewetter, *Allgemeine Logik*, 1801, 1824. I. Theil.

"§ 228. — All pure Categorical Syllogisms, whose conclusion is an affirmative judgment, rest on the following principle: — *What pertains to the attribute of an object, pertains to the object itself.* All syllogisms, whose conclusion is a negative judgment, are based upon the principle: — *What is repugnant to the attributes of an object, is repugnant to the object itself.* Two principles which can be easily deduced, — the first from the principle of Identity, the second from the principle of Contradiction.

"§ 229. — If we take into consideration that the major proposition of every categorical syllogism must be a universal rule, — from this there flow the following rules:

"1. Whatever is universally affirmed of a notion, that is also affirmed of everything contained under it. The *Dictum de Omni.*

"2. What is universally denied of a notion is denied also of everything contained under it. The *Dictum de Nullo.*

"These rules are also thus expressed:

"What pertains to the genus or species, pertains also to whatever is contained under them. What is repugnant to the genus or species, is repugnant also to whatever is contained under them."

See also the *Weitere Auseinandersetzung* on the paragraphs.

### *(t) LARROQUE.*

Larroque, *Elémens de Philosophie*, Paris, 1830. *Logique*, ch. i., p. 202. "The attribute of an affirmative proposition is taken sometimes particularly, sometimes universally. It is taken particularly when it has a greater extension than the subject; universally, when it has not a greater extension, which occurs in every proposition where the two terms are identical. The reason of this difference is palpable. If the attribute be a term more general than the subject, we affirm that the subject is a species or individual contained in the extension of the attribute: — *Man is mortal; Paul is learned;* — that is, *man* is one, and not the only, species contained in the extension of the term *mortal; Paul* is an individual, and not every individual, contained in the extension of the term *learned*. If, on the contrary, the attribute be not more general than the subject, the attribute is the same thing with the subject, and, consequently, we affirm that the subject is all that is contained in the extension of the attribute:—*A circle is a plane surface, which has all the points in [a line called] its circumference at an equal distance from a point called its centre,* — that is, a circle is *all* or *every* plane surface, etc.

"The attribute of a negative proposition is always taken universally. When we deny an attribute of a subject, we deny of this subject everything that has the nature of that attribute, that is to say, all the species, as all the individuals, contained in its extension: *The soul is not extended;* to wit the *soul* is *not any* of the species, *not any* of the individuals contained in the extension of the term *extended*."

Ch. ii., p. 230. "We have supposed, in the demonstration of these rules [the general rules of the Categorical Syllogism], that the attribute of an affirmative premise is always taken particularly. It would, therefore, seem that the calculations on which this demonstration rests are erroneous, whensoever the attribute is not a term more general than the subject, for we have seen that, in these cases, the attribute can be taken universally. But it is to be observed, that when the two terms of a proposition are identical, if the one or the other may be taken universally, they cannot both be so taken at once; and that, if it be the attribute which is taken universally, it ought to be substituted for the subject, which then affords a particular attribute. *A triangle is a figure which has three sides and three angles.* We cannot say, *All triangle is all figure, which,* etc.; but we can say, *All triangle is some figure, which,* etc.; or, *All figure which has three sides and three angles is some triangle.* Now, in adopting either of these last expressions of the proposition, the attribute is particular."

Ch. ii., p. 231. "We have seen that the Syllogism inferred from its premises a proposition to be proved; now this conclusion cannot be inferred from, unless it be contained in, the premises. From this incontestable observation the author of the Port Royal Logic has endeavored to draw the following pretended rule, by aid of which we may detect the vice of any fallacious reasoning whatsoever: *Thus should one of the premises contain the conclusion, and the other show that it is so contained.* A great many treatises on Logic call this *the single rule of the moderns.* This pompous denomination seems to point at some marvellous discovery, of which the ancients had no conception, — at some consummative result of the efforts of the human intellect. It is true, indeed, that a syllogism is invalid if the conclusion be not contained in the premises; but a fine discovery forsooth! This all the world already knew, — Aristotle among the rest; but he justly noted that it is not always easy to see whether the conclusion be contained in the premises, and it is to assure ourselves of this that he laid down his rules. The pretended rule of the Port

Royal is, therefore, not one at all; it enounces only an observation, true but barren."

### (u) GALLUPPI.

Galluppi, *Lezioni di Logica e di Metafisica.* 1832. Lez. xlvii., p. 353, ed. 1841.

"In a reasoning there must be an idea, common to the two premises; and a judgment which affirms the identity, either partial or perfect, of the other two ideas."

In the same Lecture (p. 348) he shows that he is ignorant of the law quoted from the *Philosophia Lugdunensis*, being by the authors of the *L' Art de Penser.*

### (v) BUFFIER.

Buffier, *Première Logique*, about 1725. The following is from the Recapitulation, § 109:

The Syllogism is defined, a tissue of three propositions, so constituted that if the two former be true, it is impossible but that the third should be true also. (§ 63.)

The first Proposition is called the *Major:* the second the *Minor;* the third the *Conclusion*, which last is the essential end in view of the syllogism. (§ 65.)

Its art consists in causing a consciousness, that in the conclusion the idea of the *subject* comprises the idea of the *predicate;* and this is done by means of a third idea, called the *Middle Term* (because it is intermediate between the subject and predicate), in such sort that it is comprised in the subject, and comprises the predicate. (§ 67.)

If the first thing comprise a second, in which a third is comprised, the first comprises the third. If a *fluid* comprise *chocolate*, in which *cocoa* is comprised, the *fluid* itself comprises *cocoa.* (§ 68.)

To reach distant conclusions, there is required a plurality of syllogisms. (§ 71.)

Our rule of itself suffices for all syllogisms, even for the negative; for every negative syllogism is equivalent to an affirmative. (§ 77.)

Hypothetical syllogisms consist in the enouncement, by the major premise, that a proposition is true in case there be found a certain condition; and the minor premise shows that this condition is actually found. (§ 79.)

Disjunctive syllogisms, to admit of an easy verification, ought to be reduced to hypotheticals. (§ 81.)

Although the single rule, which is proposed for all syllogisms, be subject to certain changes of expression, it is nevertheless always the most easy; in fact, all logical laws necessarily suppose this condition. (§ 87.)

The employment of Grammar is essential for the practice of Logic. (§ 90.)

By means of such practice, which enables us to estimate accurately the value of the terms in every proposition, we shall likewise obtain the rule for the discovery of all sophisms, which consist only of the mere equivocation of words, and of the ambiguity of propositions. (§ 92 *et seq.*)

### (w) *VICTORIN.*

Vietorin, *Neue natürlichere Darstellung der Logik*, Vienna, 1835.

II. Simple Categorical Syllogisms. § 94. The fundamental rule of all such syllogisms:

"*In what relation a concept stands to one of two reciprocally subordinate concepts, in the same relation does it stand to the other.*"

§ 94. First Figure; fundamental rule: — "*As a notion determines the higher notion, so does it determine the lower of the same;*" or, "*In what relation a notion stands to one notion, in the same relation it stands to the lower of the same.*"

§ 96. Second Figure; fundamental rule: — "*When two notions are oppositely determined by a third notion, they are also themselves opposed;*" or, "*If two notions stand to a third in opposed relations, they also themselves stand in a relation of opposition.*"

§ 98. Third Figure; fundamental rule: — "*As a notion determines the one of two [to it] subordinate notions, so does it determine the other;*" or, "*In what relation a notion stands to the one of two [to it] subordinate notions, in the same relation stands it also to the other.*"

§ 100. Fourth Figure; fundamental rule: — "*As a notion is determined by the one of two subordinate notions [two notions in the relation to each other of subordination], so does it determine the other:*" or, "*In what relation one of two subordinated notions [notions reciprocally subordinate or superordinate] stands as to a third, in the same relation stands it also to the other.*"

## II. — FUNDAMENTAL LAWS OF SYLLOGISM. — REFERENCES.

(See Galluppi, *Lezioni di Logica e di Metafisica*, Lez. xlvii., vol. i. p. 345 *et seq.*; Troxler, *Logik*, i. p. 33: Bolzano, *Wissenschaftslehre, Logik*, vol. ii. § 263, p. 543.)

I. Logicians who confound the Nota notæ and the Dictum de Omni, being ignorant of their several significances; making them —

a) Coördinate laws without distinction.

Jäger, *Handb. d. Logik*, § 68 (1839); Prochazka, *Gesetzb., f. d. Denken*, § 217 (1842): Calker, *Denklehre*, § 143 (1822). Troxler, *Logik*, ii. p. 40.

b) Derivative: the Dictum de Omni, to wit, from the Nota notæ. This supreme or categorical.

Wenzel, *Elem. Philos. Log.*, §§ 253, 256. *Canonik*, § 64. Kant, *Die falsche Spitzf.*, § 3. *Logik*, § 63. Krug, *Logik*, § 70. Bachmann, *Logik*, § 123. Jakob. *Logik*. § 262, 4th ed. 1800; 1st ed. 1788.

II. Logicians who enounce the law of Identity (Proportion), in the same third, by the mathematical expression *Equality*.

Reimarus, *Vernunftlehre*, § 176. Mayer, *Vernunftschlusse*, i. p. 290. Arriaga, *In. Sum.*, D. III. § 3, p. 23.

III. Logicians who make the Dictum de Omni the fundamental rule of syllogisms in general.

Aristot., *An. Prior.*, L. i. c. 1, § 4. Wolf, *Phil. Rat.*, § 353. Scheibler, *Op.* P. iv. *De Syll.* c. ii. § 12. Jac. Thomasius, *Erot. Log.*, c. 395. Buttner, *Cur-*

*sus Philos., Log.*, § 146. Conimbricenses, *In Arist. Dial., An. Prior.*, L. i. c. 2, p. 204.

IV. Logicians who confound or make coördinate the law of Proportion or Analogy, and the Dictum de Omni.

Wyttenbach, *Prac Philos. Log.*, P. iii. c. 6. § 4. Whately, *Logic*, Intr., ch. II. p. iii., § 2. Leechman, *Logic*, P. III. ch. 2. Keckermann, *Systema Logicæ Minus*, L. iii. c. 2. *Syst. Log. Majus.*, L. iii. c. 5.

V. Logicians who make the Law of Identity the one supreme.

Suter, *Logica*. § 61, calls this the principle of Identity and Contradiction. Aldrich, *Comp.*, L. i. c. 3, § 3, p. 2. Hutcheson, *Log. Comp.*, P. iii. c. 2. Arriaga, *Cur. Phil., In. Sum.*, D. iii. §§ 16–22, pp. 23, 24. Larroque, *Logique*, p. 224. Mayer, *Vernunftschusse*, i. p. 293. Troxler, *Logik*, ii. pp. 33, 40. Reimarus, *Vernunftlehre*, § 176. Mendoza, *Disp. Log. et Met.*, I. p. 470. Derodon, *Log. Rest., De Log.*, pp. 639, 644. Darjes, *Via.*, etc., § 271, p. 97. Smiglecius, *Logica*, D. xiii. p. 517, qu. etc. Fran. Bonæ Spei, *Com. Prim. in Log. Arist.*, D. vii. d. 2, p. 25. *Cursus Complut., De Arg.*, L. iii. c. 4, p. 57. Alstedius, *Enc. Logica*, § ii. c. 10, p. 435. Havichorst, *Inst. Log.*, § 324. Poncius, *Cursus Philos. In An. Prior.*, D. xx. qu. 5, p. 282.

VI. Logicians who restrict the Dictum de Omni to the First Figure (immediately).

Aldrich, *Comp.* l. 1, c. 3, § 7. Noldius, *Log. Rec.*, c. xii. p. 290. Grosser, *Pharus Intellectus*, § iii. p. 1, memb. iii. p. 137.

VII. Logicians who make the Dicta de Omni et Nullo the supreme canons for Universal Syllogisms; the law of Proportion for Singular Syllogisms.

Burgersdicius, *Inst. Log.*, L. ii. c. 8, p. 171. Melancthon, *Erot. Dial., De Syll. Expos.*, L. iii. p. 172, ed. 1586. Fonseca, *Instit. Dial.*, L. vi. cc. 21, 24, pp. 363, 373.

VIII. What name given by what logicians to the Law of Proportion, etc.

*Law of Proportion, or of Analogy*, Keckermann, *Syst. Log.* L. iii. c. 5, *Op.*, p. 746. Alstedius, *Encycl.*, p. 435. τὸ ἀναλογίας. *Dictum de Omni et Nullo Majus*, Noldius, *Log.*, p. 288. Of *Identity*, Zedler's *Lex. Pr. convenientiæ.* Darjes, *Via ad Verit*, § 270, p. 96. *Law of Proportional Identity and Non-Identity*, Self.

IX. Logicians erroneously supposing Aristotle to employ, besides the Dictum de Omni, the rule of Proportion as a fundamental law of syllogism.

Rapin, *Réflexions sur la Logique*, § 4.

X. Terms under which the law of Proportion has been enounced.

*Agree with. Coincide with. The same with. Cohere* (Syrbius). *Coëxist* (bad). *Coïdentical with. Equal to* (No. ii.). *In combination with*, Darjes, *Via ad Ver.*, p. 97 (includes negative). *Convertible.*

## III —Enunciations of the Higher Laws of Syllogism.

Law of Proportion.

Aristotle, *Elench*, c. vi. § 8. "Things the same with one and the same, are the same with one another." Compare *Topica*, L. vii. c. 1, § 6. Thus Scotus, *In An. Prior.*, L. i. qu. 9, f. 218.

Some say, "Uni tertio *indivisibili*,"— some others, "Uni tertio indivisibili. indivisibiliter sumpto." Others, in fine, say, "Uni tertio, adequate sumpto" See Irenæus, *Integ. Philos. Log.*, §§ 3, 5. Some express it, "Things that are equal to the same third are equal to each other." See Irenæus, *ib.* So Reimarus, Mayer.

Some express it, "Quæcunque conveniunt (vel dissentiunt) in uno tertio. eadem conveniunt (vel dissentiunt) inter se."

"Quæ duo conveniunt cum uno quodam tertio, eatenus conveniunt inter se; quando autem duorum unum convenit cum tertio, et alterum huic repugnat, repugnant quoque eatenus sibi invicem." Wynpersse, *Inst. Logicæ*, § 272, Lug. Bat. 3d ed. 1806.

Noldius (*Logica*, p. 288) calls these the Dicta de Omni et de Nullo. The former is, "Quæcunque affirmantur in aliquo tertio (singulari identice, universali et identice et complete distributive), affirmantur inter se." The latter, "Quorum unum [totaliter] affirmatur in aliquo tertio, alterum negatur, ea inter se negantur."

Noldius.—"Whatever is affirmed essentially of a subject, is affirmed of all that is inferior or reciprocal to that subject. Whatever is denied of a subject, is denied of all inferior or reciprocal." (See Noldius against the universal application of these Dicta, *Log. Rec.*, p. 290.)

Reusch (*Syst. Logicum*, ed. i. 1734, § 503) makes the Dicta de Omni et Nullo the rule of ordinary syllogisms, and thus enunciates them: "Si quid prædicatur de omni, illud etiam prædicatur de aliquo: et, Si quid predicatur de nullo, illud etiam non prædicatur de aliquo. Sensus prioris est, Quidquid de genere, vel specie omni prædicari potest, illud etiam prædicatur de quovis sub illo genere, vel sub illa specie, contento; Item,—Cuicunque competit definitio, illi quoque competit definitum." (And so *vice versâ* of the other.)

Syrbius gives these two rules:

1) "If certain ideas cohere with a one-third, they also cohere in the same manner with each other."

2) "Ideas which do not cohere with the same one-third, these do not cohere with each other." (Given in the original by Waldin, *Systema*, p. 162. See also *Acta Eruditorum*, 1718, p. 333.) Syrbius thinks that the law of Proportion, unless limited, is false.

Darjes, *Via ad Veritatem* (1755), § 270, p. 96, 2d ed. 1764. "Two [things or notions] in combination with the same third, may be combined together in the same respect (ea ratione) wherein they stood in combination with that third." (See further; shows that other rules are derived from this.)

Dictum de Omni, etc.

Aristotle, *Anal. Pr.*, L. i. c. i. § 11.

"To be predicated, de Omni, universally, is when we can find nothing under the subject of which the other [that is, the predicate] may not be said; and to be predicated de Nullo, in like manner."

Jac. Thomasius, *Erotemata Logica*, 1670.

"40. What do you call the foundation of syllogism?—The Dictum de Omni et Nullo.

"41. What is the Dictum de Omni?—When nothing can be subsumed under the subject of the major proposition of which its predicate may not be affirmed.

"42. What is the Dictum de Nullo?—When nothing can be subsumed under the subject of the major proposition of which its predicate is not denied."

Thomasius notices that the first rule applies only to the affirmative moods of the first figure, Barbara and Darii; the second only to the negative moods of the same figure, Celarent and Ferio.

## IV.—OBJECTIONS TO THE DICTUM DE OMNI ET NULLO.

I. As a principle of syllogism in general.

II. As a principle of the First Figure, as enounced by Aristotle.

1°, Only applies to syllogisms in extension.

2°, Does not apply to individual syllogisms; as, *Peter is running; but some man is Peter: therefore, some man is running.*

(Arriaga, *In. Summ.*, p. 24.)

3°, Does not apply to coëxtensive reasonings; as, *All trilateral is (all) triangular; but all triangular has three angles equal to two right angles; ergo*, etc. Arriaga, *ib.*

Dictum de Omni et Nullo does not apply,

1°, To the other Figures than the First.

2°, Not to all the moods of First Figure, for in many of these the higher class is subjected to the lower.

3°, The form of the First Figure does not depend upon the principle of the Dictum de Omni et Nullo. This imperfect; not upon the thorough-going principle, that in this figure one notion is compared to a second, and this second with a third.

## V.—GENERAL LAWS OF SYLLOGISM IN VERSE.

(1) Partibus ex puris sequitur nil (2) sive negatis.
(3) Si qua præit partis, sequitur conclusio partis.
(4) Si qua negata præit, conclusio sitque negata.
(5) Lex generalis erit, medium concludere nescit.[1]
(6) Univocusque: (7) triplex; (8) ac idem terminus esto.[2]
(1) Distribuas medium; (2) nec quartus terminus adsit.
(3) Utraque nec præmissa negans; (4) nec particularis.
(5) Sectetur partem conclusio deteriorem;
(6) Et non distribuat nisi cum præmissa, (7) negetve.[3]

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[1] Petrus Hispanus, *Summulæ*. [Tr. iv. c. 3, f. 45 b.—Ed.]

[2] Campanella, *Dialect.*, p. 384.

[3] Hutcheson, *Log. Comp.* [P. iii. c. 3, p. 53.—Ed.]

(1) Terminus esto triplex: medius, majorque, minorque:
(2) Latius hunc quam præmissæ, conclusio non vult,
(3) Nequaquam medium capiat conclusio oportet.
(4) Aut semel aut iterum medium generaliter esto.
(5) Nil sequitur geminis ex particularibus unquam.
(6) Utraque si præmissa neget, nihil inde sequetur.
(7) Ambæ affirmantes nequeunt generare negantem.
(8) Est parti similis conclusio deteriori.
Pejorem sequitur semper conclusio partem.[1]
(1) Terminus est geminus, mediumque accedit utrique.
(2) Præmissis dicat ne finis plura, caveto.
(3) Aut semel. aut iterum medium genus omne capessat;
(4) Officiique tenax rationem claudere nolit.
(1) Terminus est triplex. (2) Medium conclusio vitet.
(3) Hoc ex præmissis altera distribuat.
(4) Si præmissa simul fuit utraque particularis,
(5) Aut utrinque negans, nulla sequela venit.
(6) Particulare præit? sequitur conclusio partis.
(7) Ponitur ante negans? Clausula talis erit.
(8) Quod non præcessit. conclusio nulla requirit.[2]
Tum re, tum sensu, triplex modo terminus esto.
Argumentari non est ex particulari.
Neque negativis recte concludere si vis.
Nunquam complecti medium conclusio debet.
Quantum præmissæ, referat conclusio solum.
Ex falsis falsum verumque aliquando sequetur;
Ex veris possunt nil nisi vera sequi.[3]

### VI. — Special Laws of Syllogism in Verse.

1. Fig. Sit minor affirmans, nec major particularis.
2. Fig. Una negans esto, major vero generalis.
3. Fig. Sit minor affirmans, conclusio particularis.
4. Fig. a) Major ubi affirmat. generalem sume minorem.
   b) Si minor affirmat, conclusio sit specialis.
   c) Quando negans modus est, major generalis habetur.[4]

## B. — CRITICISM.

### I. — Criticism of the Special Laws of Syllogism.

The Special Laws of Syllogism, that is, the rules which govern the several Figures of Categorical Reasonings, all emerge on the suspension of the logical

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[1] Purchot, with variations of Seguy, *Ph. Lugd.*, Galluppi [Purchot. *Inst. Phil.*, vol. i., *Logica*, P. iii. c. 3. p. 171. — Ed.]

[2] Isendoorn, *Logica*, L. iii. c. 8, p. 427, 8°, (1652). Chauvin and Walch, *Lex. v. Syllog.*

[3] Crakanthorpe, *Logica*, L. iii. c. 15, p. 210.

[4] Ubaghs, *Logicæ Elementa*, § 225. Sancrucius, *Dialectica ad Mentem Doct. Subtilis*, L. i. c. 3, p. 103. Lond. 1673.

postulate, — To be able to state in language what is operative in thought. They all emerge on the refusal or neglect to give to the predicate that quantity in overt expression which it possesses in the internal operations of mind. The logicians assert, 1°, That in affirmative propositions the predicate must be always presumed particular or indefinite, though in this or that proposition it be known and thought as universal or definite; and, 2°, That in negative propositions this same predicate must be always presumed absolutely (*i. e.*, universally or definitely) excluded from the sphere of the subject, even though in this or that proposition it be known and thought as partially (*i. e.*, particularly or indefinitely) included therein. The moment, however, that the said postulate of Logic is obeyed, and we are allowed to quantify the predicate in language, as the predicate is quantified in thought, the special rules of syllogism disappear, the figures are all equalized and reduced to unessential modifications; and while their moods are multiplied, the doctrine of syllogism itself is carried up to the simplicity of one short canon. Having already shown that the general laws of syllogism are all comprised and expressed in this single canon,[1] it now only remains to point out how, on the exclusive doctrine of the logicians, the special rules became necessary, and how, on the unexclusive doctrine which is now propounded, they became at once superfluous and even erroneous. It is perhaps needless to observe, that the following rules have reference only to the whole of Extension.

The double rule of the First Figure, that is, the figure in which the middle term is subject in the sumption, and predicate in the subsumption, is, — *Sit minor affirmans, nec major particularis.* Here, in the first place, it is prescribed that the minor premise must be affirmative. The reason is manifest; because, if the minor premise were negative, the major premise behooved to be affirmative. But in this figure, the predicate of the conclusion is the predicate of the major premise; but if affirmative, the predicate of that premise, on the doctrine of the logicians, is presumed particular, and as the conclusion following the minor premise is necessarily negative, a negative proposition thus, contrary to logical law, has a particular predicate. But if we allow a negative proposition to have in language, as it may have in thought, a particular or indefinite predicate, the rule is superseded.

The second rule, or second part of the rule, of this First Figure, is, that the major premise should be universal. The reason of this is equally apparent. For we have seen that, by the previous rule, the minor premise could not be negative, in which case certainly, had it been allowable, the middle term would, as predicate, have been distributed. But whilst it behooved that the middle term should be once at least distributed (or taken universally), and, as being the subject of the major premise, it could only be distributed in a universal proposition, the rule, on the hypothesis of the logicians, was compulsory. But as we have seen that the former rule is, on our broader ground, inept, and that the middle term may be universally quantified, as the predicate either of an affirmative or negative subsumption, it is equally manifest that this rule is, in like manner, redundant, and even false.

In the Second Figure, that is, the figure in which the middle term is predicate both in sumption and subsumption, the special rule is, — *Una negans esto; major vero generalis.*

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[1] See pp. 536 and 583. — Ed.

In regard to the first rule, or first half of the rule, — That one or other of the premises should be negative, — the reason is manifest. For, on the doctrine of the logicians, the predicate of an affirmative proposition is always presumed to be particular; consequently, in this figure the middle term can, on their doctrine, only be distributed (as distributed at least once it must be) in a negative judgment. But, on our doctrine, on which the predicate is quantified in language as in thought, this rule is abolished.[1]

The second rule, or second moiety of the rule, — That the sumption should be always universal, — the reason of this is equally clear. For the logicians, not considering that both extremes were in equilibrio in the same whole of extension, and, consequently, that neither could claim [in either quantity] the place of major or minor term, and thereby constitute a true major or a true minor premise; — the logicians, I say, arbitrarily drew one instead of two direct conclusions, and gave the name of major term to that extreme which formed the predicate in that one conclusion, and the name of major premise to that antecedent proposition which they chose to enounce first. On their doctrine, therefore, the conclusion and one of the premises being always negative, it behooved the sumption to be always general, otherwise, contrary to their doctrine, a negative proposition might have a particular predicate. On our doctrine, however, this difficulty does not exist, and the rule is, consequently, superseded.

In the Third Figure, that is, the figure in which the middle term is subject of both the extremes, the special rule is, — *Sit minor affirmans; conclusio particularis.*

Here the first half of the rule, — That the minor must not be negative, — is manifestly determined by the common doctrine. For (major and minor terms, major and minor propositions, being in this figure equally arbitrary as in the second) here the sumption behooving to be affirmative, its predicate, constituting the major term or predicate of the conclusion, behooved to be particular also. But the conclusion following the minor premise would necessarily be negative; and it would have — what a negative proposition is not allowed on the common doctrine — an undistributed predicate.

The second half of the rule, — That the conclusion must be particular, — is determined by the doctrine of the logicians, that the particular antecedent, which they choose to call the minor term, should be affirmative. For, in this case, the middle term being the subject of both premises, the predicate of the subsumption is the minor extreme; and that, on their doctrine, not being distributed in an affirmative proposition, it consequently forms the undistributed subject of the conclusion. The conclusion, therefore, having a particular subject, is, on the common doctrine, a particular proposition. But as, on our doctrine, the predicate of an affirmative proposition may have a universal quantification, the reason fails.

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[1] [For examples from Aristotle of affirmative conclusions in the Second Figure, see *De Cœlo*, L ii. c. 4, § 4, text 23, *ibi* Averroes. *Phys.* L. ii. c. 2, § 12, text 23, *ibi* Averroes; c. 4, § 8, text 33, *ibi* Averroes. *Ib.* c. 7, § 1, text 42, *ibi* Averroes. *An Post*, L. i. c. 12, § 12, text 92, *ibi* Averroes et Pacius. Argues himself, like Cæneus, from two affirmative propositions in Second Figure, and does not give the reason why the inference is good or bad in such syllogism. Cf. Ammonius and Philoponus *ad. loc.* *An. Prior*, L. ii. c. 22, §§ 7, 8. *An. Post*, L. i. c. 6, § 1, *et ibi*. Themistius, Pacius, Zabarella. Cf. also Zabarella, *De Quarta Fig. Syll.*, c. x.]

### II. — LAWS OF SECOND FIGURE — ADDITIONAL.[1]

By designating the quantity of the predicate, we can have the middle term (which in this figure is always a predicate) distributed in an affirmative proposition. Thus:

*All* P *is all* M;
*All* S *is some* M;
*Therefore, all* S *is some* P.

*All the things that are organized are all the things that are endowed with life;*
*But all plants are some things endowed with life;*
*Therefore, all plants are some things organized.*

This first rule (see above, p. 291) must, therefore, be thus amplified: — The middle term must be of definite quantity, in one premise at least; that is, it must either, 1°, Be a singular, — individual, — concept, and, therefore, identical in both premises; or, 2°, A universal notion presumptively distributed by negation in a single premise; or, 3°, A universal notion expressly distributed by designation in one or both premises.

But the second rule, which has come down from Aristotle, and is adopted into every system of Logic, with only one exception, an ancient scholiast, is altogether erroneous. For, 1°, There is properly no sumption and subsumption in this figure: for the premises contain quantities which do not stand to each other in any reciprocal relation of greater or less. Each premise may, therefore, stand first. The rule ought to be, "One premise must be definite;" but such a rule would be idle; for what is here given as a special canon of this figure, was already given as one of the laws of syllogism in general. 2°, The error in the principle is supported by an error in the illustration. In both the syllogisms given,[2] the conclusion drawn is not that which the premises warrant. Take the first or affirmative example. The conclusion here ought to have been, *No* S *is some* P, or, *Some* P *is no* S; for there are always two equivalent conclusions in this figure. In the concrete example, the legitimate conclusions, as necessitated by the premises, are, — *No horse is some animal*, and, *Some animal is no horse.* This is shown by my mode of explicating the quantity of the predicate, — combined with my symbolical notation. In like manner, in the second or negative syllogism, the conclusion ought to have been either of the two following: In the abstract formula, — *All* S *are not some* P, or, *Some* P *are not all* S; — in the concrete example, *All topazes are not some min-*

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[1] What follows to page 583 was an early written interpolation by the author in *Lectures* (p. 291), being an application of the principle of a quantified predicate to syllogism. The interpolation appears in students' notes of the Lectures of session 1841-42, and was probably given still earlier. — ED.

[2] See p. 292. — ED.

*erals, i. e., No topazes are some minerals*, or, *Some minerals are not all topazes. i. e., Some minerals are no topazes.*

The moods Cesare and Camestres may be viewed as really one, for they are only the same syllogism, with premises placed first or second, as is always allowable in this [Figure], and one of the two conclusions, which are always legitimately consequential, assigned to each.

A syllogism in the mood Festino admits of either premise being placed first; it ought, therefore, to have had another mood for its pendant, with the affirmative premise first, the negative premise second, if we are to distinguish moods in this figure by the accidental arrangement of the premises. But this was prohibited by the second Law of this Figure, — that the Sumption must always be universal. Let us try this rule in the formula of Festino now stated, reversing the premises.

*Some* S *are* M (i. e., *some* M);  
*No* P *is* M;

{ *No* P *is some* S. }  
{ *Some* S *are no* P. }

*Some actions are praiseworthy;*  
*No vice is praiseworthy;*

{ *No vice is some action.* }  
{ *Some action is no vice.* }

From what I have now said, it will be seen that the Dictum de Omni et de Nullo cannot afford the principle of the Second Figure.

The same errors of the logicians, on which I have already commented, in supposing that the sumption or major premise in this figure must always be universal, — an error founded on another error, that there is (properly speaking) either sumption or subsumption in this figure at all, — this error, I say, has prevented them recognizing a mood corresponding to Baroco, the first premise being a particular negative, the second a universal affirmative, *i. e.*, Baroco with its premises reversed. That this is competent is seen from the example of Baroco now given. Reversing it we have:

| | |
|---|---|
| [*Some á are not* B; | *Some animals are not (any) oviparous;* |
| *All* a *are* B. | *All birds are (some) oviparous.* |
| *No* a *is some á;* | *No bird is some animal;* |
| *Some á are no* a.] | *Some animal is no bird.* |

### III. — Author's Supreme Canons of Categorical Syllogisms.

[The supreme Canon or Canons of the Categorical Syllogism, finally adopted by Sir W. Hamilton, are as follows:]

I. "For the Unfigured Syllogism, or that in which the terms compared do not stand to each other in the reciprocal relation of subject and predicate, being, in the same proposition, either both subjects or (possibly) both predicates,

— the canon is: — *In so far as two notions* (notions proper, or individuals) *either both agree, or one agreeing, the other does not, with a common third notion; in so far, these notions do or do not agree with each other.*

II. "For the Figured Syllogism, in which the terms compared are severally subject and predicate, consequently, in reference to each other, containing and contained in the counter wholes of Intension and Extension, — the canon is: — *What worse relation of subject and predicate subsists between either of two terms and a common third term, with which one, at least, is positively related; that relation subsists between the two terms themselves.*

"Each Figure has its own Canon.

"First Figure: — *What worse relation of determining (predicate) and of determined (subject) is held by either of two notions to a third, with which one at least is positively related; that relation do they immediately (directly) hold to each other, and indirectly (mediately) its converse.*

"Second Figure: — *What worse relation of determined (subject) is held by either of two notions to a third, with which one at least is positively related; that relation do they hold indifferently to each other.*

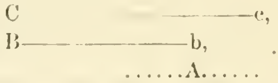
"Third Figure: — *What worse relation of determining (predicate) is held by either of two notions to a third, with which one at least is positively related; that relation do they hold indifferently to each other.*"[1]

## IV. — ULTRA-TOTAL QUANTIFICATION OF MIDDLE TERM.

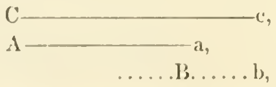
### (a) LAMBERT'S DOCTRINE.

Lambert, *Neues Organon.*

*Dianoiologie*, § 193. "If it be indetermined how far A does, or does not, coincide with B, but, on the other hand, we know that A and B, severally, make up *more than half*[2] the individuals under C, in that case it is manifest that a [linear] notation is possible, and that of the two following kinds:



"For since B and A are each *greater than the half* of C, A is consequently greater than C less by B; and in this case, it is of necessity that some A are B, and some B are A.[3] We may accordingly so delineate:



seeing that it is indifferent whether we commence with A or with B. I may add, that the case which we have here considered does not frequently occur, inasmuch as the comparative extension of our several notions is a relation which remains wholly unknown.[1] I, consequently, adduce this only as an example, that a legitimate employment may certainly be made of these relations."

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[1] *Discussions*, pp. 654, 655. — ED.

[2] It is enough if either A or B exceed the half; the other need be only half. This, which Lambert here and hereafter overlooks, I have elsewhere had occasion to show. See below, p 588.

[3] In the original, for A there is, by a typographical erratum, C. See *Ph.* § 208.

*Phänomenologie*, § v. *Of the probable* —

"§ 188. In so far as such propositions are particular, they may, like all other particular propositions, be syllogistically employed; but no farther, unless we look to their degree of particularity, or other proximate determination, some examples of which we have adduced in the *Dianoiologie* (§ 235 *et seq.*). Thus the degree of particularity may render a syllogism valid, which, without this, would be incompetent. For example:

*Three-fourths of* A *are* B;
*Two-thirds of* A *are* C;
*Therefore, some* C *are* B.

The inference here follows, because three-fourths added to two-thirds are greater than unity; and, consequently, there must be, at least, five-twelfths of A which are at once B and C.

"§ 204. In the Third Figure we have the middle term, subject in both premises, and the conclusion, particular. If, now, the subjects of the two premises be furnished with fractions [*i. e.*, the middle term on both sides], both premises remain, indeed, particular, and the conclusion, consequently, indetermined. But, inasmuch as, in both premises, the degree of particularity is determined, there are cases where the conclusion may be drawn not only with probability, but with certainty. Such a case we have already adduced (§ 188.) For, if both premises be affirmative, and the sum of the fractions with which their subjects are furnished greater than unity, in that case a conclusion may be drawn. In this sort we infer with certainty:

*Three-fourths of* A *are* B;
*Two-thirds of* A *are* C;
*Therefore, some* C *are* B.

"§ 205. If, however, the sum of the two fractions be less than unity, as —

*One-fourth of* A *are* B;
*One-third of* A *are* C,

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[1] In reference to this statement, see above, *Dian.* § 179, and below, *Ph.* § 157, where it is repeated and confirmed. Lambert might have added that, as we rarely can employ this relation of the comparative extension of our notions it is still more rarely of any import that we should. For in the two abstract, or notional, wholes, — the two wholes correlative and counter to each other, with which Logic is always conversant (the Universal and Formal), — if the extension be not complete, it is of no consequence to note its comparative amount. For Logic and Philosophy tend always to an unexclusive generality; and a general conclusion is invalidated equally by a single adverse instance as by a thousand. It is only in the concrete or real whole, — the whole quantitative or integrate, and, whether continuous or discrete, the whole in which mathematics are exclusively conversant, but Logic and Philosophy little interested, — that this relation is of any avail or significance.

in that case there is no certainty in any affirmative conclusion [indeed in any conclusion at all]. But if we state the premises thus determinately, —

*Three-fourths of* A *are not* B;
*Two-thirds of* A *are not* C;

in that case, a negative conclusion may be drawn. For, from the propositions,

*Three-fourths of* A *are not* B;
*One-third of* A *are* C;

there follows — *Some* C *are not* B. And this, again, because the sum of the two fractions (three-fourths added to one-third) is greater than unity." And so on. See the remainder of this section and those following, till § 211.

### (b) *AUTHOR'S DOCTRINE.*

Aristotle, followed by the logicians, did not introduce into his doctrine of syllogism any quantification between the absolutely universal and the merely particular predesignations, for valid reasons. — 1°, Such quantifications were of no value or application in the one whole (the universal potential, logical), or, as I would amplify it, in the two correlative and counter wholes (the logical and the formal, actual, metaphysical), with which Logic is conversant. For all that is out of classification, — all that has no reference to genus and species, is out of Logic, indeed out of Philosophy; for Philosophy tends always to the universal and necessary. Thus the highest canons of deductive reasoning, the *Dicta de Omni et de Nullo*, were founded on, and for, the procedure from the universal whole to the subject parts; whilst, conversely, the principle of inductive reasoning was established on, and for, the (real or presumed) collection of all the subject parts as constituting the universal whole. — 2°, The integrate or mathematical whole, on the contrary (whether continuous or discrete), the philosophers contemned. For whilst, as Aristotle observes, in mathematics genus and species are of no account, it is, almost exclusively, in the mathematical whole that quantities are compared together, through a middle term, in neither premise, equal to the whole. But this reasoning, in which the middle term is never universal, and the conclusion always particular, is, as vague, partial, and contingent, of little or no value in philosophy. It was accordingly ignored in Logic; and the predesignations *more*, *most*, etc., as I have said, referred to universal, or (as was most common) to particular, or to neither, quantity.[1] This discrepancy among logicians long ago attracted my attention; and I saw, at once, that the possibility of inference, considered absolutely, depended exclusively on the quantifications of the middle term, in both premises, being, together, more than its possible totality — its distribution, in any one. At the same time I was impressed — 1°, With the almost utter inutility of such reasoning, in a philosophical relation; and, 2°, Alarmed with the load of valid moods which its recognition in Logic would introduce. The mere quantification of the predicate, under the two pure quantities of *definite* and *indefinite*, and the two qualities of *affirmative* and *negative*, gives (abstractly) in each figure *thirty-six* valid moods; which (if my present calculation be correct) would be multiplied, by the introduction of the two hybrid or ambiguous quantifications of *a majority* and *a half*, to the fearful amount of *four hundred and eighty* valid moods for each figure. Though not, at the time, fully aware of the strength of these objections, they, however, prevented me from breaking down the old limitation; but as my supreme canon of Syllogism proceeds on the mere formal possibility of reasoning, it of course comprehends all the legitimate forms of quantification. It is: — *What worst relation of subject and predicate subsists between either of two terms and a common third term, with which one, at least, is positively related; that relation subsists between the two terms themselves:* in other words, — *In as far as two notions both agree, or, one agreeing, the other disagrees, with a common third notion; in so far those notions agree or disagree with each other.* This canon applies, and proximately, to all categorical syllogisms, — in extension and comprehension, — affirmative and negative, — and of any figure. It determines all the varieties of such syllogisms: is developed into all their general, and supersedes all their special, laws. In short, without violating this canon, no categorical reasoning can, formally, be wrong. Now, this canon supposes that the two extremes are compared together through the *same common middle;* and this cannot but be if the middle, whether subject or predicate, in both its quantifications together, exceed its totality, though not taken in that totality in either premise.

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[1] [Cf. Corvinus, *Instit. Phil.* c. v. § 376, p. 123. Ienæ, 1742 Reusch, Wallis.] [Reusch, *Syst. Log.* § 360. Wallis, *Instit. Log.* L. ii c 4, p. 100. 5th ed. — Ed.]

But, as I have stated, I was moved to the reconsideration of this whole matter; and it may have been Mr. De Morgan's syllogism in our correspondence (p. 19) which gave the suggestion. The result was the opinion, that these two quantifications should be taken into account by Logic, as authentic forms, but then relegated, as of little use in practice, and cumbering the science with a superfluous mass of moods.[1]

### *AUTHOR'S DOCTRINE — continued.*

No syllogism can be formally wrong in which (1°), Both premises are not negative; and (2°), The quantifications of the middle term, whether as subject or predicate, taken together, exceed the quantity of that term taken in its whole extent. In the former case, the extremes are not compared together; in the latter, they are not necessarily compared through the same third. These two simple rules (and they both flow from the one supreme law) being obeyed, no syllogism can be bad, let its extremes stand in any relation to each other as major and minor, or in any relation to the middle term. In other words, its premises may hold any mutual subordination, and may be of any Figure.

On my doctrine, Figure being only an unessential circumstance, and every proposition being only an equation of its terms, we may discount Figure, etc., altogether; and instead of the symbol (▬▬——) marking subject and predicate, we might use the algebraical sign of equality (=).

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[1] Extract from *A Letter to A. de Morgan, Esq., from Sir W. Hamilton*, p. 41. — ED.

The rule of the logicians, that the middle term should be once at least distributed [or indistributable] (*i. e.*, taken universally or singularly = definitely), is untrue. For it is sufficient if, in both the premises together, its quantification be more than its quantity as a whole (Ultratotal). Therefore, a *major part* (a *more* or *most*) in one premise, and a *half* in the other, are sufficient to make it effective. It is enough, for a valid syllogism, that the two extreme notions should (or should not), of necessity, partially coincide in the third or middle notion; and this is necessarily shown to be the case if the one extreme coincide with the middle to the extent of a half (Dimidiate Quantification); and the other to the extent of aught more than a half (Ultradimidiate Quantification). The first and highest quantification of the middle term ( : ) is sufficient, not only in combination with itself, but with any of all the three inferior. The second ( . , ) suffices in combination with the highest, with itself, and with the third, but not with the lowest. The third ( . ) suffices in combination with either of the higher, but not with itself, far less with the lowest. The fourth and lowest ( , ) suffices only in combination with the highest. [1. Definite; 2. Indefinito-definite; 3. Semi-definite; 4. Indefinite.]

(1*st March*, 1847. — Very carefully authenticated.)

There are 4 quantities ( , | . | ., | : ), affording (4×4) 16 possible double quantifications of the middle term of a syllogism.

Of these 10 are legitimate equivalents ( : $\overset{1}{M}$ : | $\overbrace{:M.,\ |\ .,M.}^{2}$ | $\overbrace{:M.\ |\ .M:}^{3}$ | $\overbrace{:M,\ |\ ,M:}^{4}$ | ., $\overset{5}{M}$ ., | $\overbrace{.,M.\ |\ .M.,}^{6}$ ); and 6 illegitimate, as not, together, necessarily exceeding the quantity of that term, taken once in its full extent ( ., M , | , M ., | . M . | . M , | , M . | . M , ).

Each of these 16 quantified middle terms affords 64 possible moods; to wit, 16 affirmative, 48 negative; legitimate and illegitimate.

Altogether, these 16 middle terms thus give 256 affirmative and 768 negative moods; which, added together, make up 1024 moods, legitimate and illegitimate, for each figure. For all three figures = 3072.

The 10 legitimate quantifications of the middle term afford, of legitimate moods, 160 affirmative and 320 negative (= 480), *i. e.*, each 16 affirmative and 32 negative moods (= 48); besides of illegitimate moods, from double negation, 160, *i. e.*, each 16. The 6 illegitimate quantifications afford, of affirmative moods, 96; of simple negative moods, 192; of double negative moods, 96 (= 384). Adding all the illegitimates = 544.

The 1024 moods, in each figure, thus afford, of legitimate, 480 moods (1440 for all 3 Figs.); being of affirmative 160 (480 for 3 Figs.), of negative 320 (960 for 3 Figs.), of illegitimate 544 moods; there being excluded in each, from inadequate distribution alone (§), 288 moods (viz., 96 affirmative, 192 negative); from double negation alone (‡), 160 moods; from inadequate distribution and double negation together (§‡), 96 moods.

### (c) *MNEMONIC VERSES.*

A it affirms of *this*, *these*, *all* —
Whilst E denies of *any:*
I, it affirms, whilst O denies,
Of *some* (or few or many).

Thus A affirms, as E denies,
And definitely either:
Thus I affirms, as O denies,
And definitely neither.

A *half*, left semi-definite,
Is worthy of its score;
U, then, affirms, as Y denies,
This, neither less nor more.

Indefinito-definites,
To UI and YO we come;
And that affirms, and this denies,
Of *more*, *most* (half plus some).

UI and YO may be called Indefinito-definite, either (1°). Because they approximate to the whole or definite, [forming] more than its moiety, or (2°), Because they include a half, which, in a certain sense, may be regarded as definite, and something, indefinite, over and above.

# VII.

## INDUCTION AND EXAMPLE.

(See p. 225.)

### I. — Quotations from Authors.

### (a) *ARISTOTLE.*

Aristotle, *Prior Analytics*, B. ii. c. 23. After stating that "we believe all things either through [deductive] Syllogism or from Induction," he goes on to expound the nature of this latter process.

"Now, Induction, and the Syllogism from Induction, is the inferring one extreme [the major] of the middle through the other; if, for instance, B is the middle of A C, and, through C, we show that A inheres in B. Thus do we institute Inductions. In illustration: — Let A be *long-lived*, B, *wanting-bile*, and C, *individual long-lived animals, as man, horse, mule*, etc. A, then, inheres in the whole of C (for all animal *without bile* is [at least some] *long-lived*); but

B, *wanting bile*, also [partially, at least] inheres in all C.[1] If now C reciprocate with B, and do not go beyond that middle [if C and B, subject and predicate, are each all the other], it is of necessity that A [some, at least] should inhere in [all] B. For it has been previously shown,[2] that if any two [notions] inhere in the same [remote notion], and if the middle[3] reciprocate with either [or with both], then will the other of the predicates [the syllogism being in the third figure] inhere in the co-reciprocating extreme. But it behooves us to conceive C as a complement of the *whole* individuals; for Induction has its inference *through* [as it is of] all.[1]

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[1] I have, however, doubts whether the example which now stands in the Organon be that which Aristotle himself proposed. It appears, at least, to have been considerably modified, probably to bring it nearer to what was subsequently supposed to be the truth. This I infer as likely from the Commentary of Ammonius on the *Prior Analytics*, occasionally interpolated by, and thus erroneously quoted under the name of a posterior critic, — Joannes, surnamed Philoponus, etc. His words are, in reference to Aristotle, as follows: — "He wishes, through an example, to illustrate the Inductive process; it is of this intent. Let A be *long-lived*; B, *wanting bile*; C, as *crow, and the like*. Now, he says, *that the crow and the stag*, being animals without bile and long-lived, therefore, animal wanting bile is long lived. Thus, through the last [or minor] do we connect the middle term with the [major] extreme. For I argue thus: — the individual animals wanting bile are [all] long-lived; consequently, [all] animals wanting bile are long-lived." F. 107, a. ed. Ald. Compare also the greatly later Leo Magentinus, on the *Prior Analytics*, f. 41, a. ed. Ald. On the age of Magentinus, historians (as Saxius and Fabricius) vary, from the seventh century to the fourteenth. He was certainly subsequent to Michael Psellus, junior, whom he quotes, and, therefore, not before the end of the eleventh century; whilst his ignorance of the doctrine of Conversion, introduced by Boethius, may show that he could hardly have been so recent as the fourteenth.

Aristotle, *De Part. Animal* (L. iv. c. 2), says, "In some animals the gall [bladder] is absolutely wanting, as in the horse, mule, ass, stag, and roe." . . . . "It is, therefore, evident that the gall serves no useful purpose, but is a mere excretion. Wherefore those of the ancients say well, who declare that the cause of longevity is the absence of the gall, and this from their observation of the solidungula and deer, for animals of these classes want the gall, and are long-lived." — *Hist. An.* L. ii. c. 11, Schn. 18, Scal. 15 vul. Notices that some animals have, others want, the gall-bladder (χολὴ, v. Schn. iii. p. 106), at the liver. Of the latter, among viviparous quadrupeds, he notices stag, roe, horse, mule, ass, etc. Of birds who have the gall-bladder apart from the liver and attached to the intestines, he notices the pigeon, crow, etc.

[2] Aristotle refers to the chapter immediately preceding, which treats of the Reciprocation of Terms, and in that to the fifth rule which he gives, and of the following purport: "Again, when A and B inhere in all C [*i. e.*, all C is A and is B], and when C reciprocates [*i. e.*, is of the same extension and comprehension] with B, it is necessary that A should inhere in all B [*i. e.*, that all B should be A]."

[3] For ἄκρον, I read μέσον; but perhaps the true lection is — *πρὸς τοῦτο θάτερον αὐτῶν ἀντιστρέφῃ τῶν ἄκρων*. The necessity of an emendation becomes manifest from the slightest consideration of the context. In fact, the common reading yields only nonsense, and this on sundry grounds. — 1°, There are three things to which θάτερον is here applicable, and yet it can only apply to two. But if limited, as limited it must be, to the two inherents, two absurdities emerge. 2°, For the middle, or common, notion, in which both the others inhere, that, in fact, here exclusively wanted, is alone excluded. 3°, One, too, of the inherents is made to reciprocate with either; that is, with itself, or other. 4°, Of the two inherents, the minor extreme is that which, on Aristotle's doctrine of Induction, is alone considered as reciprocating with the middle or common term. But, in Aristotle's language, τὸ ἄκρον, "*The Extreme*," is (like ἡ πρότασις, *The Proposition* in the common language of the logicians) a synonyme for the major, in opposition to, and in exclusion of, the minor, term. In the two short correlative chapters, the present and that which immediately follows, on Induction and on Example, the expression, besides the instance in question, occurs at least seven times; and in all as the major term. — 5°, The emendation is required by the demonstration itself, to which Aristotle refers. It is found in the chapter immediately preceding (§ 5), and is as follows: — "Again, when A and B inhere in all C, *and when C reciprocates with B*, it necessarily follows that A should [partially, at least] inhere in all B. For whilst A [some, at least] inheres in all C, and [all] C, by reason of their reciprocity, inheres in [all] B; A will also [some, at least] inhere in all B." The mood here given is viii. of our Table. (See Appendix XI.)

"This kind of syllogism is of the primary and immediate proposition. For the reasoning of things mediate is, through their medium, of things immediate, through Induction. And in a certain sort, Induction is opposed to the [Deductive] Syllogism. For the latter, through the middle term, proves the [major] extreme of the third [or minor]; whereas the former, through the third [or minor term, proves] the [major] extreme of the middle. Thus [absolutely], in nature, the syllogism, through a medium, is the prior and more notorious; but [relatively] to us, that through Induction is the clearer."

*An. Pr.*, L. ii. c. 24. Of Example. — § 1. "Example emerges, when it is shown that the [major] extreme inheres in the middle, by something similar to the third [or minor term]. . . . . § 4. Thus it is manifest that the Example does not hold the relation either of a whole to part [Deduction], nor of a part to whole [Induction], but of part to part; when both are contained under the same, and one is more manifest than the other. § 5. And [Example] differs from Induction, in that this, from all the individuals, shows that the [major] extreme inheres in the middle, and does not [like Deduction] hang the syllogism on the major extreme; whereas that both hangs the syllogism [on the major extreme], and does not show from all the individuals [that the major extreme is inherent in the minor.]"

*An. Post.*, L. i. c. 1, § 3. — "The same holds true in the case of reasonings, whether through [Deductive] Syllogisms or through Induction; for both accomplish the instruction they afford from information foreknown, the former receiving it as it were from the tradition of the intelligent, the latter manifesting the universal through the light of the individual." (Pacii, p. 413. See the rest of the chapter.)

*An. Pos.*, L. i. c. 18, § 1. — "But it is manifest that, if any sense be wanting, some relative science should be wanting likewise, this it being now impossible for us to apprehend. For we learn everything either by induction or by demonstration. Now, demonstration is from universals, and induction from particulars; but it is impossible to speculate the universal unless through induction, seeing that even the products of abstraction will become known to us by induction."

A. Aristotle's Errors regarding Induction.

Not making Syllogism and its theory superior and common to both Deductive and Inductive reasonings.

A corollary of the preceding is the reduction of the genus Syllogism to its species Deductive Syllogism, and the consequent contortion of Induction to Deduction.

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[1] This requisite of Logical Induction, — that it should be thought as the result of an agreement of all the individuals or parts, — is further shown by Aristotle in the chapter immediately following, in which he treats the reasoning from Example. See passage quoted on page 590 (§ 5).

B. Omissions.
Omission of negatives.
Of both terms reciprocating.

C. Ambiguities.
Confusion of Individuals and Particular. See Scheibler [*Opera Logica*, P. iii. *De Prop.*, c. vi., tit. 3, 5. — Ed.].
Confusion or non-distinction of Major or Minor extremes.

The subsequent observations are intended only to show out Aristotle's authentic opinion, which I hold to be substantially the true doctrine of Induction; to expose the multiform errors of his expositors, and their tenth and ten times tenth repeaters, would be at once a tedious, superfluous, and invidious labor. I shall, first of all, give articulately the correlative syllogisms of Induction and Deduction which Aristotle had in his eye; and shall employ the example which now stands in the *Organon*, for, though physiologically false, it is, nevertheless (as a supposition), valid, in illustration of the logical process.

ARISTOTLE'S CORRELATIVE SYLLOGISMS.

| (*a*) Of Induction. | (*b*) Of Deduction. |
|---|---|
| *All* C (*man, horse, mule, etc.*) *is some* A (*long-lived*); | *All* A (*wanting-bile*) *is some* A (*long-lived*); |
| *All* C (*man, horse, mule, etc.*) *is all* B (*wanting-bile*); | *All* C (*man, horse, mule, etc.*) *is all* B (*wanting-bile*); |
| *All* B (*wanting-bile*) *is some* A (*long-lived*). | *All* C (*man, horse, mule, etc.*) *is some* A (*long-lived*). |

A, ——: C (p, q, r, etc.) : ——: B    A, ——: B : ——: C (p, q, r, etc.)

These syllogisms, though of different figures, fall in the same mood; in our table they are of the eighth mood of the third and first Figures. Both unallowed. (See Ramus, quoted below, p. 593.)

The Inductive syllogism in the first figure given by Schegkius, Pacius, the Jesuits of Coimbra, and a host of subsequent repeaters, is altogether incompetent, so far as meant for Aristotle's correlative to his Inductive syllogism in the third. Neither directly nor indirectly does the philosopher refer to any Inductive reasoning in any other figure than the third. And he is right; for the third is the figure in which all the inferences of Induction naturally run. To reduce such reasonings to the first figure, far more to the second, is felt as a contortion, as will be found from the two following instances, the one of which is Aristotle's example of Induction, reduced by Pacius to the first figure, and the other the same example reduced by me to the second. I have taken care also to state articulately what are distinctly thought, — the quantifications of the predicate in this reasoning, ignored by Pacius and logicians in general, and admitted only on compulsion, among others, by Derodon (below, p. 594), and the Coimbra commentator.[1]

### ARISTOTLE'S INDUCTIVE SYLLOGISM IN FIGURES.

| (*c*) Fig. I. | (*d*) Fig. II. |
|---|---|
| *All* C (*man, horse, mule, etc.*) *is some* A (*long-lived*); | *Some* A (*long-lived*) *is all* C (*man, horse, mule, etc.*); |
| *All* B (*wanting-bile*) *is all* C (*man, horse, mule, etc.*); | *All* B (*wanting-bile*) *is all* C (*man, horse, mule, etc.*); |
| *All* B (*wanting-bile*) *is some* A (*long-lived*). | *All* B (*wanting-bile*) *is some* A (*long-lived*). |

### (*b*) *PACHYMERES.*

Pachymeres, *Epitome of Aristotle's Logic* (Title viii. ch. 3, c. 1280). — "Induction, too, is celebrated as another instrument of philosophy. It is more persuasive than Deductive reasoning, for it proposes to infer the universal from singulars, and, if possible, from all. But as this is frequently impossible, individuals being often in number infinite, there has been found a method through which we may accomplish an Induction, from the observation even of a few. For, after enumerating as many as we can, we are entitled to call on our adversary to state on his part, and to prove, any opposing instances. Should he do this, then [for, 'data instantia, cadit inductio'] he prevails; but should he not, then do we succeed in our Induction. But Induction is brought to bear in the third figure; for in this figure is it originally cast. Should, then, the minor premise be converted, so that the middle be now predicated of all the minor extremes, as that extreme was predicated of all the middle; in that case, the conclusion will be, not of *some*, but of *all*. [In induction] the first figure, therefore, arises from conversion, — from conversion of the minor premise, — and this, too, converted into *all*, and not into *some*. But [an inductive syllogism] is drawn in the third figure, as follows: — Let it be supposed that we wish to prove, — *every animal moves the lower jaw*. With that intent, we place as terms: — the major, *moves the under jaw:* the minor, [*all*] *animal;* and, lastly, the middle, *all contained under animal*, so that *these contents* reciprocate with *all animal*. And it is thus perfected [?] in the first figure, as follows: — *To move the lower jaw* is predicated of *all individual animals; these all* are predicated of *all animal;* therefore, *moving the lower jaw* is predicated of *all animal*. In such sort induction is accomplished."

### (*c*) *RAMUS.*

Ramus, *Scholæ Dialecticæ*, L. viii. c. 11. "Quid vero sit inductio perobscure [Aristoteli] declaratur: nec ab interpretibus intelligitur, quo modo syllogismus per medium concludat majus extremum de minore: inductio majus de medio per minus." Ramus has confirmed his doctrine by his example. For, in his expositions, he himself is not correct.

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[1] [*In An. Prior*, L. ii. p. 403. Cf. Perionius, *Dialectica*, L. iii. p. 366 (1544). Tosca, *Comp. Phil Logica*, t. I. l. iii. c. 1, p. 115 ]

### (d) DERODON.

Derodon. *Logica Restituta*, 1659, p. 602. *Philosophia Contracta*, 1664, *Logica*, p. 91. "Induction is the argumentation in which, from *all* the particulars, their universal is inferred; as — *Fire, air, water, earth, are bodies; therefore, every element is body.* It is recalled, however, to syllogism, by assuming all the particulars [including singulars] for the middle term, in this manner: —*Fire, air, water, and earth are bodies; but fire, air, water, and earth are every element; therefore, every element is body.* Again: — *The head, chest, feet,* etc., *are diseased; but the head, chest, feet,* etc., *are the whole animal; therefore, the whole animal is diseased.* Thus induction is accomplished when, by the enumeration of *all* the individuals, we conclude of the species what holds of all its individuals; as — *Peter, Paul, James,* etc., *are rational; therefore, all man is rational;* or when, by the enumeration of *all* the species, we conclude of the genus what holds of all its species; as — *Man, ass, horse,* etc., *are sensitive; therefore, all animal is sensitive;* or when, by the enumeration of *all* the parts, we conclude the same of the whole; as — *Head, chest, feet,* etc., *are diseased; therefore, the whole animal is diseased.*"

### (e) THE COLLEGE OF ALCALA.

A curious error in regard to the contrast of the Inductive and the Deductive syllogism stands in the celebrated *Cursus Complutensis*, — in the *Disputations on Aristotle's Dialectic*, by the Carmelite College of Alcala, 1624 (L. iii. c. 2). We there find surrendered Aristotle's distinctions as accidental. Induction and Deduction are recognized, each as both ascending and descending, as both from, and to, the whole; the essential difference between the processes being taken, in the existence of a middle term for Deduction, in its non-existence for Induction. The following is given as an example of the descending syllogism of Induction: —*All men are animals; therefore, this, and this, and this,* etc., *man is an animal.* An ascending Inductive syllogism is obtained from the preceding, if reversed. Now all this is a mistake. The syllogism here stated is Deductive; the middle, minor, and major terms, the minor premise and the conclusion being confounded together. Expressed as it ought to be, the syllogism is as follows: —*All men are (some) animals; this, and this, and this,* etc., *are (constitute) all men: therefore, this, and this, and this,* etc., *are (some) animal.* Here the middle term and three propositions reäppear; whilst the Deductive syllogism in the first figure yields, of course, on its reversal, an Inductive syllogism in the third.

The vulgar errors, those till latterly, at least, prevalent in this country, — that Induction is a syllogism in the Mood Barbara of the first figure (with the minor or the major premise usually suppressed); and still more that from a *some* in the antecedent we can logically induce an *all* in the conclusion, — these, on their own account, are errors now hardly deserving of notice, and have been already sufficiently exposed by me, upon another occasion *(Edinburgh Review*, LVII. p. 224 *et seq.).*' [*Discussions*, p. 158 *et seq.* — Ed.]

### *(f) FACCIOLATI.*

Facciolati, *Rudimenta Logica*, P. iii. c. 3, defines Induction as "a reasoning without a middle, and concluding the universal by an enumeration of the singulars of which it is made up." His examples show that he took it for an Enthymeme. — "*Prudence, Temperance, Fortitude*, etc., *are good habits* [*these constitute all virtue*] ; *therefore* [*all*] *virtue is a habit.*"

### *(g) LAMBERT.*

Lambert, *Neues Organon*, i. § 287. "When, in consequence of finding a certain attribute in all things or cases which pertain to a class or species [genus (?)], we are led to affirm this attribute of the notion of the class or genus; we are said to find the attribute of a class or genus through induction. There is no doubt that this succeeds so soon as the induction is complete, or so soon as we have ascertained that the class or species A contains under it no other cases than C, D, E, F, . . . . . . M, and that the attribute B occurs in each of the cases C, D, E, F, . . . . . . . M. This process now presents a formal syllogism in *Caspida*. For we thus reason —

C, *as well as* D, E, F, . . . . . . M *are all* B;
*But* A *is either* C, *or* D, *or* E, *or* F . . . . . *or* M;
*Consequently, all* A *are* B.

"The example previously given of the syllogistic mood *Caspida* may here serve for illustration. For, to find whether every syllogism of the Second Figure be negative, we go through its several moods. These are *Cesare*, *Camestres*, *Festino*, *Baroco*. Now both the first conclude in E, both the last in O. But E and O are negative, consequently all the four, and herewith the Second Figure, in general, conclude negatively.[1] As, in most cases, it is very difficult to render the minor proposition, which has the disjunctive predicate for its middle term, complete, there are, therefore, competent very few perfect inductions. The imperfect are [logically] worthless, since it is not in every case allowable to argue from *some* to *all*. And even the perfect we eschew, whensoever the conclusion can be deduced immediately from the notion of the genus, for this inference is a shorter and more beautiful."

Strictures on Lambert's doctrine of Induction.

1°, In making the minor proposition disjunctive.

2°, In making it particular.

3°, In making it a minor of the First Figure instead of the Third.

Better a categorical syllogism of the Third Figure, like Aristotle, whom he does not seem to have been aware of. Refuted by his own doctrine in § 230.

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[1] It is given in § 285, as follows:

"*The syllogisms, as well in Cesare as in Camestres, Festino, and Baroco, are all negative ;*

"*Now every syllogism of the Second Figure is either in Cesare, or Camestres, or Festino, or Baroco ;*

"*Consequently every syllogism in the Second Figure is Negative.*"

The recent German Logicians,[1] following Lambert (*N. Org.* i. § 287), make the inductive syllogism a byword. Lambert's example: — "C, *as well as* D, E, F . . . . . M, *all are* B; *but* A *is either* C, *or* D, *or* E, *or* F, . . . . . *or* M; *therefore, all* A *is* B." Or, to adapt it to Aristotle's example: — *Man, as well as horse, mule*, etc., *all are long-lived animals; but animal void of gall is either man, or horse, or mule*, etc.; *therefore, all animal void of gall is long-lived.*

This, I find, was an old opinion, and is well invalidated by the commentators of Louvain.[2]

The only inducement to the disjunctive form is, that the predicate is exhausted without the predesignation of universality, and the First Figure attained. But as these crotchets have been here refuted, therefore, the more natural, etc.

Some logicians, as Oxford Crakanthorpe (*Logica*, l. iii. c. 20, published 1622, but written long before), hold that induction can only be recalled to a Hypothetical syllogism. As, — *If Sophocles be risible, likewise Plato and all other men, then all man is risible; but Socrates is risible, likewise Plato and all other men; therefore all man is risible.* Against the Categorical syllogism in one or other figure he argues: — "This is not a universal categorical, because both the premises are singular; nor a singular categorical, because the conclusion is universal." It is sufficient to say, that, though the *subjects* of the premises be singular (Crakanthorpe does not contemplate their being particular), as supposed to be *all* the constituents of a species or relatively universal whole, they are equivalent to that species; their universality (though contrary to Aristotle's canon) is, indeed, overtly declared, in one of the premises, by the universal predesignation of the *predicate.* Our author further adds, that Induction cannot be a categorical syllogism, because it contains *four* terms; this quaternity being made by the "*all men*" (in his example) of the premises being considered as different from the "*all man*" of the conclusion. This is the veriest trifling. The difference is wholly factitious: *all man, all men*, etc., are virtually the same; and we may indifferently use either or both, in premises and conclusion.

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[1] As Herbart, *Lehrbuch der Logik*, § 69, Twesten, Drobisch, H. Ritter.

[2] "I am aware of the opinion of many, that the singulars in the Inductive syllogism should be enumerated by a disjunctive conjunction, in so much that the premises of such a syllogism are commonly wont to be thus cast: *Whatsoever is John, or Peter, or Paul, etc., is capable of instruction.* But they err, not observing that the previous proposition is manifestly equivalent to the following, — *John, and Peter, and Paul, etc., are capable of instruction.*" (Lovanienses, *Com. In An. Pr.*, L. ii. tr. 3, c. 2, p. 283, ed. 1547: 1st ed., 1555.) This here said of the major is true of Lambert's minor. The Louvain masters refer probably [to Versor, etc.] This doctrine, — that the Inductive syllogism should be drawn in a disjunctive form, — was commonly held, especially by the scholastic commentators on Petrus Hispanus. Thus Versor (to take the books at hand), whose *Exposition* first appeared in 1487, says: — "In the fourth place, Induction is thus reduced to syllogism, seeing that, in the conclusion of the Induction, there are two terms of which the subject forms the minor, and the predicate the major, extreme in the syllogism; whilst the singulars, which have no place in the conclusion, constitute the middle term. Thus the Induction — *Socrates runs, Plato runs (and so of other men); therefore, all man runs*, — is thus reduced: *All that is Socrates, or Plato (and so of others), runs; but all man is Socrates, or Plato (and so of others); therefore, all man runs.* And these singulars ought to be taken disjunctively, and disjunctively, not computatively, verified of their universal." — (*In Hisp. Summul.* Tr. v.)

The same doctrine is held in the *Reparationes* of Arnoldus de Tungeri and the Masters Regent in the Burse (or College) of St. Lawrence, in Cologne, 1496 (Tr. iii. c. ii., Sec. Pri.)

It is also maintained in the *Copulati* of Lambertus de Monte, and the other Regents in the Bursa Montis of Cologne, 1490. They give their reasons, which are, however, not worth stating and refuting.

But Tartaretus, neither in his Commentaries on Hispanus nor on Aristotle, mentions this doctrine.

## II. — MATERIAL INDUCTION.

Material or Philosophical Induction is not so simple as commonly stated, but consists of two syllogisms, and two deductive syllogisms, and one an Epicheirema. Thus:

I —*What is found true of some constituents of a natural class, is to be presumed true of the whole class (for nature is always uniform); $a$ $a'$ $a''$ are some constituents of the class* A; *therefore, what is true of $a$ $a'$ $a''$ is to be presumed true of* A.

II —*What is true of $a$ $a'$ $a$,″ is to be presumed true of* A; *but $z$ is true of $a$ $a'$ $a'$; therefore, $z$ is true of* A.

It will be observed, that all that is here inferred is only a presumption, founded, 1°, On the supposed uniformity of nature; 2°, That A is a natural class; 3°, On the truth of the observation that $a$ $a'$ $a''$ are really constituents of that class A; and, 4°, That $z$ is an essential quality, and not an accidental. If any be false, the reasoning is nought, and, in regard to the second, $a$ $a'$ $a''$ *(some)* cannot represent A *(all)* if in any instance it is found untrue. "*Data instantia cadit inductio.*" In that case the syllogism has an undistributed middle.

# VIII.

## HYPOTHETICAL AND DISJUNCTIVE REASONING — IMMEDIATE INFERENCE.

### I. — Author's Doctrine — Fragments.

(See p. 231.)

All Mediate inference is one; that incorrectly called *Categorical;* for the *Conjunctive* and *Disjunctive* forms of *Hypothetical* reasoning are reducible to immediate inferences.

Inference, (Subject and Predicate Quantified.)
- Immediate; of which some kinds are
  - Recognized, as Propositional. (Various.)
  - Not recognized, as Syllogistic,
    - Disjunctive, / Conjunctive, — Hypothetical.
- Mediate; Syllogism Proper, (Categorical.)
  - A) Analytic. / B) Synthetic.
    - a) Unfigured.
    - b) Figured, (Intensive or Extensive) in
      - F. I. / F. II. / F. III. — All with same Moods.[1]

§ 1. Reasoning is the showing out explicitly that a proposition, not granted or supposed, is implicitly contained in something different, which is granted or supposed.

§ 2. What is granted or supposed is either a single proposition, or more than a single proposition. The Reasoning in the former case is Immediate, in the latter Mediate.

§ 3. The proposition implicitly contained may be stated first or last. The Reasoning in the former case is Analytic, in the latter Synthetic.

*Observations.* — § 1. "A proposition," not a truth; for the proposition may not, absolutely considered, be true, but, relatively to what is supposed its evolution, is and must be necessary. All Reasoning is thus hypothetical; hypothetically true, though absolutely what contains, and, consequently, what is contained, may be false.[2]

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[1] Reprinted from *Discussions*, p. 656. — Ed.

[2] That all logical reasoning is hypothetical, and that Categorical Syllogism is really, and in a higher signification, hypothetical, see Maimon, *Versuch einer neuen Logik*, § vi. 1.,

*Observations.* — § 2. Examples: Immediate — *If* A *is* B, *then* B *is* A; Mediate — *If* A *is* B, *and* B *is* C, *then* A *is* C.

*Observations.* — § 3. Examples: Analytic — B *is* A, *for* A *is* B; A *is* C, *for* A *is* B, *and* B *is* C. Synthetic — A *is* B; *therefore*, B *is* A; A *is* B, and B *is* C; *therefore*, A *is* C.

## ON THE NATURE AND DIVISIONS OF INFERENCE OR SYLLOGISM IN GENERAL.

(November, 1848.)

I. Inference, what . . . . . .

II. Inference is of three kinds; what I would call the — 1°, *Commutative;* 2°, *Explicative;* and, 3°, *Comparative.*

1°, In the first, one proposition is given; and required what are its formal commutations?

2°, In the second, two or more connected propositions are given, under certain conditions (therefore, all its species are conditionals); and required what are the formal results into which they may be explicated. Of this genus there are two species, — the one the Disjunctive Conditional, the other the Conjunctive Conditional. In the Disjunctive (the Disjunctive also of the Logicians), two or more propositions, with identical subjects or predicates, are given, under the disjunctive condition of a counter quality, *i. e.*, that one only shall be affirmative; and it is required what is the result in case of one or other being affirmed, or one or more denied. (Excluded Middle.) In the Conjunctive (the Hypotheticals of the logicians), two or more propositions, convertible or contradictory, with undetermined quality, are given, under the conjunctive condition of a correlative quality, *i. e.*, that the affirmation or negation of one being determined, determines the corresponding affirmation or negation of the others; and it is required what is the result in the various possible cases. (Identity and Contradiction, not Sufficient Reason, which in Logic is null as a separate law.)

3°, In the third, three terms are given, two or one of which are positively related to the third, and required what are the relations of these two terms to each other?[1]

III. All inference is hypothetical.

IV. It has been a matter of dispute among logicians whether the class which

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pp. 82, 88. E. Reinhold, *Logik*, § 109, p. 253 *et seq.* Smiglecius, *Logica*, Disp xiii. q. 5, p. 495 (1st ed. 1616)

On the nature of the Necessity in Syllogistic Inference; distinction of Formal and Material Necessity, or of *necessitas consequentiæ* and *necessitas consequentis*, see Scotus, *Quæstiones, Super Elenchos*, qu iv., 227. ed 1639, and that all inference hypothetical, *In An. Prior*, L. ii. qu. i. p. 331. Apuleius, *De Hab. Doct Plat.*, p. 34. Aristotle, *An. Prior*, i. 32, § 5. Smiglecius, *Logica, loc. cit.* Balforeus, *In Arist. Org., An. Prior*, i. t. 8, p. 451. 1616. [See also *Discussions*, p. 146, note. — ED.]

[1] A better statement of the three different processes of Reasoning.

I. Given a proposition; commutative; — what are the inferences which its commutations afford?

II. Given two or more propositions; related and conditionally; — what are the inferences which the relative propositions, explicated under these conditions, afford?

III. Given three notions; two related, and at least one positively, to a third; — what are the inferences afforded in the relations to each other, which this comparison of the two notions to the third determines?

I call *Explicative* (viz., the Hypothetical and Disjunctive Syllogisms) be of Mediate or Immediate inference. The immense majority hold them to be mediate: a small minority, of which I recollect only the names of Kant [Fischer, Weiss, Bouterwek, Herbart],[1] hold them to be immediate.

The dispute is solved by a distinction. Categorical Inference is mediate, the medium of conclusion being a term; the Hypothetical and Disjunctive syllogisms are mediate, the medium of conclusion being a proposition, — that which I call the *Explication.* So far they both agree in being mediate, but they differ in four points. The first, that the medium of the Comparative syllogism is a term; of the Explicative, a proposition. The second, that the medium of the Comparative is one; of the Explicative, more than one. The third, that in the Comparative the medium is always the same; in the Explicative, it varies according to the various conclusion. The fourth, that in the Comparative the medium never enters the conclusion; whereas, in the Explicative, the same proposition is reciprocally medium or conclusion.

V. Logicians, in general, have held the Explicative class to be composite syllogisms, as compared with the Categoric; whilst a few have held them to be more simple. This dispute arises from each party taking a partial or one-sided view of the classes. In one point of view, the Explicative are the more complex, the Comparative the more simple. In another point of view, the reverse holds good.

Our Hypothetical and Disjunctive Syllogisms may be reduced to the class of Explicative or Conditional. The Hypotheticals should be called, as they were by Boethius and others, *Conjunctive*, in contrast to the coördinate species of *Disjunctive.* Hypothetical, as a name of the species, ought to be abandoned.

The Conjunctive are conditional, inasmuch as negation or affirmation is not absolutely asserted, but left alternative, and the quality of one proposition is made dependent on another. They are, however, not properly stated. The first proposition, — that containing the condition, — which I would call the *Explicand*, should be thus enounced: *As* B, *so* A; — or, *As* B *is*, *so is* A; or, *As* C *is* B, *so is* B A. Then follows the proposition containing the explication, which I would call the *Explicative;* and, finally, the proposition embodying the result, which I would call the *Explicate.*

They are called *Conjunctives* from their conjoining two convertible propositions in a mutual dependence, of which either may be made antecedent or consequent of the other.

Disjunctive syllogisms are conditional, inasmuch as a notion is not absolutely asserted as subject or predicate of another or others, but alternatively conjoined with some part, but only with some part, of a given plurality of notions, the affirmation of it with one part involving the negation of others. The first proposition, containing the condition, I would call the *Explicand*, and so forth as in the Conjunctives. They are properly called *Disjunctives.*

[1] [Kant, *Logik*, § 75. Bouterwek, *Lehrbuch der philosophischen Vorkenntnisse*, § 100, p. 158, 2d ed. 1820. Fischer, *Logik*, c. v. §§ 99, 100, p. 137. Weiss, *Logik*, §§ 210, 251. Herbart, *Lehrbuch zur Einleitung in die Philosophie*, § 64, p. 87, 1834.]

### DISTRIBUTION OF REASONINGS.

(Nov. 1848). — Inference may be thus distributed, and more fully and accurately than I have seen. It is either (I.) Immediate, that is, without a middle term or medium of comparison; or (II.) Mediate, with such a medium.[1]

Both the Immediate and the Mediate are subdivided, inasmuch as the reasoning is determined (A) to one, or (B) to one or other, conclusion. (It is manifest that this latter division may constitute the principal, and that *immediate* and *mediate* may constitute subaltern classes.)

All inference, I may observe in the outset, is hypothetic, and what have been called *Hypothetical Syllogisms* are not more hypothetic than others.

I. A — Immediate Peremptory Inference, determined one conclusion, contains under it the following species:[2] . . . . .

I. B — Immediate Alternative Inference contains under it these five species, —

1°, Given one proposition, the alternative of affirmation and negation. As — A *either is or is not; but* A *is; therefore*, A *is not not.* Or, A *is or is not* B; but A *is* B; *therefore*, A *is not not*-B.

This species is anonymous, having been ignored by the logicians; but it requires to be taken into account to explain the various steps of the process.

2°, Given one proposition, the alternative between different predicates. This is the common Disjunctive Syllogism.

3°, The previous propositions conjoined, given one proposition, etc. As, A *either is or is not either* B *or* C *or* D; *but* A *is* B; *therefore, it is not not*-B, *it is not* C, *it is not* D.

Alias, A *is either* B *or non*-B, *or* C *or non*-C, *or* D *or non*-D; *but* A *is* B; *therefore it is not non*-B, *and it is non*-C, *and it is non*-D.

4°, Given two propositions, second dependent on the first, and in the first the alternative of affirmation and negation. This is the Hypothetical Syllogism of the logicians. It is, however, no more hypothetical than any other form of reasoning; the so-called hypothetical conjunction of the two radical propositions being only an elliptical form of stating the alternation in the one, and the dependence on that alternation in the other. For example: *If* A *is* B, B *is* C; this merely states that A *either is or is not* B, and that B *is or is not* C, *according as* A *is or is not* B. In short — *As* A *is or is not* B, *so* B *is or is not* C.

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[1] [Cf. Fonseca, *Instit. Dial.*, L. vi. c. 1., 1st ed. 1564. Eustachius, *Summa Philosophiæ Quadripartita, Dialectica*, P. iii. tract. i., p. 112. ["Quoniam argumentatio est quædam consequentia (latius enim patet consequentia quam argumentatio), prius de consequentia, quam de argumentatione dicendum est. Consequentia igitur, sive consecutio, est oratio in qua ex aliquo aliquid colligitur; ut, *Omnis homo est animal, igitur aliquis homo est animal.*" — Ed.] [Whether Immediate Inference really immediate, see, on the affirmative, E. Reinhold, *Logik*, § 106; on the negative, Wolf, *Phil. Rat.*, § 461. Krug, *Logik*, § 94. p. 287. Schulze, *Logik*, §§ 85-90 (§ 80, 5th ed.). Cf. Maimon, *Versuch einer neuen Logik*, Sect. v. § 2, p. 74 *et seq.* F. Fischer, *Logik*, p. 104 *et seq.* Bachmann, *Logik*, § 105, p. 154 *et seq.* Reimarus, *Vernunftlehre*, § 159 *et seq.* (1765) Bolzano, *Wissenschaftslehre, Logik*, vol. ii. § 255 *et seq.* Twesten, *Logik, insbesondere die Analytik*, § 77, p. 66. Rösling, *Die Lehren der reinen Logik*, § 130, p. 391. Scheibler, *Op. Log., De Proposit. Consecutione*, p. 492 *et seq.*]

[2] [Kinds of Immediate Inference. I Subalternation. II Conversion. III. Opposition — (a) of Contradiction — (b) of Contrariety — (c) of Subcontrariety. IV. Equipollence. V. Modality. VI Contraposition. VII. Correlation. VIII. Identity.

Fonseca (IV), (I), (II). Eustachius (I), (IV), (II), (VIII.) Wolf, (IV), (VII), (III), a, b, c, (II). Stattler, (I), (IV), (II), (III) Kant, (I), (III), a, b, c, (II), (VI). E. Reinhold, (I), (II), (VI), (VII). Rösling, (I). (IV), (II), (III), a, b, c, (V). Krug, (IV), (I), (III), a, b, c, (II), (V). G. E. Schulze, (IV), (I), (III), (II). S. Maimon, (I). (III), (II), (VI). Bachmann, (IV), (I). (III), a, b, c, (II), (VI), (V). Platner, (I), (II), (III), (IV). F. Fischer, (V), (I), (III), (II), (VI) Reimarus, (IV), (I), (III). a, b, (II). Twesten, (I), (V), (III), (IV), (II), (VI). See pp. 534, 535.]

(Errors, — 1°, This is not a mediate inference.

2°, This is not more composite than the categorical.

3°, The second proposition is not more dependent upon the first than the first upon the second.)

5°, Given two propositions, one alternative of affirmation and negation, and another of various predicates; the Hypothetico-disjunctive or Dilemmatic Syllogism of the logicians.

II. A — Mediate Peremptory Inference. This is the common Categorical Syllogism. Three propositions, three actual terms, one primary conclusion, or two convertible equally and conjunctly valid.

II. B — Mediate Alternative Syllogism. Three propositions, three possible terms, and conclusions varying according . . . .

. . . . . . . . . . . . . . . .

2°, The Disjunctive Categorical.

4°, The Hypothetical Categorical.

5°, Hypothetico-Disjunctive Categorical.

. . . . . . . . . . . . . . . .

### HYPOTHETICAL SYLLOGISM. — CANON.

(Oct. 1848.) — Canon — Two or more propositions thought as indetermined in quality, but as in quality mutually dependent, the determination of quality in the one infers a determination of the corresponding quality in the other.

This canon embodies and simplifies the whole mystery of Hypothetical Syllogisms, which have been strangely implicated, mutilated, and confused by the logicians.

1°, What are called Hypothetical Propositions and Syllogisms are no more hypothetical than others. They are only hypothetical as elliptical. When we say, *If* A *is*, *then* B *is*, we mean to say the proposition, A *is or is not*, and the proposition, B *is or is not*, are mutually dependent, — that as the one so the other. *If* here only means taking for the nonce one of the qualities to the exclusion of the other; I, therefore, express in my notation the connection of the antecedent and consequent of a hypothetical proposition, thus:

(A x ━━━━━ x ━━┿━━) = (B x ━━━━━ x ━━┿━━)

2°, The interdependent propositions are erroneously called *Antecedent* and *Consequent*. Either is antecedent, either is consequent, as we choose to make them. Neither is absolutely so. This error arose from not expressing overtly the quantity of the subject of the second proposition. For example: *If man is, then animal is.* In this proposition, as thus stated, the negation of the first does not infer the negation of the second. For *man* not existing, *animal* might be realized as a consequent of *dog*, *horse*, etc. But let us consider what we mean: we do not mean *all animal*, but *some* only, and that *some* determined by the attribute of *rationality* or such other. Now, this same *some animal* depends on *man*, and *man* on it; expressing, therefore, what we mean in the proposition thus: —*If all man is, then some animal is*, — we then see the mutual dependence and convertibility of the two propositions.[1] For to say that *no animal is*, is not to explicate but to change the terms.

3°, The interdependent propositions may be dependent through their counter qualities, and not merely through the same. For example: *As our hemisphere is or is not illuminated, so the other is not or is; but the other is not illuminated; therefore ours is.* Another: *If* A *is, then* B *is not; but* B *is; therefore* A *is not.*

### DISJUNCTIVE AND HYPOTHETICAL SYLLOGISMS PROPER.

Aristotle ignores these forms, and he was right.[2] His followers, Theophrastus and Eudemus, with the Stoics, introduced them into Logic as coördinate with the regular syllogism; and their views have been followed, with the addition of new errors, up to the present hour. In fact, all that has been said of them has been wrong.

1°, These are not composite by contrast to the regular syllogism, but more simple.

2°, If inferences at all, these are immediate, and not mediate.

3°, But they are not argumentations, but preparations (explications) for argumentation.[3] They do not deal with the quæsitum, — do not settle it; they only put the question in the state required for the syllogistic process; this, indeed, they are frequently used to supersede, as placing the matter in a light which makes denial or doubt impossible; and their own process is so evident, that they might, except for the sake of a logical, an articulate, development of all the steps of thought, be safely omitted, as is the case with the quæsitum itself. For example:

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[1] Cf. Titius, *Ars Cogitandi*, c. xii. § 26. "In specie falsum quoque arbitror, quod Syllogismi Conditionales duas habeant figuras, quæ his muniantur regulis, (1) *posito antecedente, ponitur consequens*, non vero *remoto antecedente, removetur consequens*. (2) *remoto consequente, removetur antecedens*, non autem *posito consequente, ponitur antecedens*, . . . § 28. Videamus specialius; contra primam regulam sic peccatur:

*Si Chinenses sunt Mahometani, sunt infideles,*
*At non sunt Mahometani,*
*Ergo non sunt infideles,*

"nam conclusio hic est absurda! Verum si prædicatum conclusionis sumatur particulariter, nulla est absurditas, si autem generaliter, tum evadunt quatuor termini. § 9. Eodem exemplo secunda regula etiam illustratur, sed assumemus aliud ex Weisio, *d. l.*

*Si miles est doctus, novit libros* (nempe sicut eruditi solent).

*Sed novit libros* (scil. ut alii homines, etiam indocti, nosse solent)

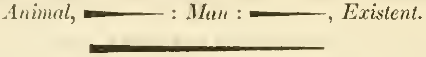
*Ergo miles est doctus.*

"Hæc conclusio itidem pro falsa habetur! Sed jam indicavimus in addita parenthesi veram causam, nempe quatuor terminos, quodsi autem medius terminus eodem sensu accipiatur, ac in syllogismo formaliter proposito queat minor probari, tum conclusio erit verissima, idque virtute præmissarum. § 30. Omnis igitur error exinde habet originem, quod quantitatem prædicati vel non intelligant, vel non observent; si igitur hunc lapsum evites, objecta exempla omnia, qualia etiam Weisius *d. l.* commemorat, facile dilues." — Ed

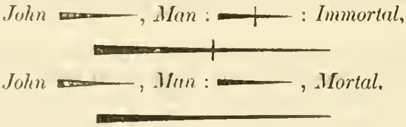
[2] Cf. Titius, *Ars Cogitandi*, c. xii. § 7. "Syllogismus Disjunctivus est enthymema sine majore, bis, oratione disjuncta et positiva, propositum. . . . § 17. Conditionalis seu Hypotheticus nihil aliud est quam enthymema vel sine majore, vel minore, bis, prima scil. vice, conditionaliter, secunda, pure, propositum. § 20. Sequitur nullum peculiare concludendi fundamentum vel formam circa Syllogismos Conditionales occurrere, nam argumentationes imperfectas, adeoque materiam syllogismorum regularium illi continent." — Ed.

[3] This I say, for, notwithstanding what M. St. Hilaire so ably states in refutation of my paradox, I must adhere to it as undisproved. — See his Translation of the *Organon*, vol. iv. p. 55.

1. Hypothetical (so called) Syllogism. Let the quæsitum or problem be, to take the simplest instance. — *Does animal exist?* This question is thus hypothetically prepared — *If man is, animal is. But* [as is conceded] *man is; therefore, animal is.* But here the question, though prepared, is not solved; for the opponent may deny the consequent, admitting the antecedent. It, therefore, is incumbent to show that the existence of *animal* follows that of *man*, which is done by a categorical syllogism.



2. Disjunctive (so called) Syllogism. Problem — *Is John mortal?* Disjunctive syllogism — *John is either mortal or immortal; but he is not immortal: ergo* [and this, consequently, is admitted as a necessary alternative] *he is mortal.* But the [alternative antecedent] may be denied, and the alternative consequent falls to the ground. It is, therefore, necessary to show either that *he is not immortal*, or — the necessary alternative — that *he is mortal*, which is done by categorical syllogism.



### HYPOTHETICAL INFERENCE.

Inasmuch as a notion is thought, it is thought either as existing or as non-existing; and it cannot be thought as existing unless it be thought to exist in this or that mode of being, which, consequently, affords it a ground, condition, or reason of existence. This is merely the law of Reason and Consequent; and the hypothetical inference is only the limitation of a supposed notion to a certain mode of being, by which, if posited, its existence is affirmed; if sublated, its existence is denied. For example: *If* A *is, it is* B; *but* A *is*, etc.

Again, we may think the existence of B (consequently of A B) as dependent upon C, and C as dependent upon D, and so forth. We, accordingly, may reason: *If* A *is* B, *and* B *is* C, *and* C *is* D, etc.

### DISJUNCTIVE SYLLOGISM PROPER.

(October 1848.) — Inasmuch as a notion is thought, it is thought as determined by one or other, and only by one or other, of any two contradictory attributes; and inasmuch as two notions are thought as contradictory, the one or the other, and only the one or the other, is thought as a determining attribute of any other notion. This is merely the law of Excluded Middle. The disjunctive inference is the limitation of a subject notion to the one or to the other of two predicates thought as contradictories; the affirmation of the one inferring the negation of the other, and *vice versâ.* As, A *is either* B *or not* B, etc. Though, for the sake of brevity, we say A *is either* B *or* C *or* D, each of these must be conceived as the contradictory of every other; as, B = | C | D, and so on with the others.

### HYPOTHETICALS (CONJUNCTIVE AND DISJUNCTIVE SYLLOGISM).

(April 30, 1849.) — These syllogisms appear to be only modifications or corruptions of certain immediate inferences; for they have only two terms, and obtain a third proposition only by placing the general rule of inference (stating, of course, the possible alternatives), disguised, it is true, as the major premise. It is manifest that we might prefix the general rule to every mediate inference; in which case a syllogism would have four propositions; or, at least, both premises merged in one complex proposition, thus:

> *If* A *and* C *be either subject or predicate* [*of the same term?*], *they are both subject or predicate of each other;*
> *But* B *is the subject of* A *and predicate of* B [C?];
> ∴ A *is the predicate of* C.[1]

Thus, also, a common hypothetical should have only *two* propositions. Let us take the immediate inference, prefixing its rule, and we have, in all essentials, the cognate hypothetical syllogism.

### 1. — Conjunctive Hypothetical.

| | |
|---|---|
| *All* B *is* (*some or all*) A; | *All men are* (*some*) *animals;* |
| *Some or all* B *exists;* | (*All or some*) *men exist;* |
| *Therefore, some* A *exists.* | *Therefore, some animals exist.* |

Here it is evident that the first proposition merely contains the general rule upon which all immediate inference of inclusion proceeds; to wit, that, the subjective part being, the subjective whole is, etc.

Now, what is this but the Hypothetical Conjunctive?

| | |
|---|---|
| *If* B *is,* A *is;* | *If man is, animal is;* |
| *But* B *is;* | *But man is;* |
| *Therefore,* A *is.* | *Therefore, animal is.* |

---

[1] There seems to be an error here in the author's MS. It is obvious that a mediate inference may be expressed in the form of a hypothetical syllogism. Thus: *If* B *is* A, *and* C *is* B, *then* C *is* A; *but* B *is* A, *and* C *is* B; *therefore,* C *is* A. This is apparently what the author means to express in a somewhat different form. — ED

### 2. — Hypothetical Disjunctive.

| | |
|---|---|
| B *is either* A *or not* A; | *Man is either animal or non-animal;* |
| *But* B *is* A; | *But man is animal;* |
| *Therefore*, B *is not not*-A. | *Therefore, is not non-animal.* |

Stating this hypothetically, we may, of course, resolve the formal contradictory into the material contrary. But this is wholly extralogical.

### HYPOTHETICAL AND DISJUNCTIVE SYLLOGISMS.

(1848 or 1849.) — The whole antecedent must be granted; and there cannot be two propositions inferred. In Categorical Syllogisms, the antecedent is composed of the major and minor premises, and there is only one simple conclusion (though this may, in the second and third figures, vary). So in Hypothetical and Disjunctive Syllogisms the whole antecedent is the two clauses of the first proposition; and the whole inference is the first and second clauses of the second proposition, erroneously divided into minor proposition and conclusion.

(January 1850.) — The Medium or Explicative may be indefinitely various, according to the complexity of the Explicand; and so may the Explicate. The explicative and the explicate change places in different explications. There is, in fact, no proper medium-explicative or conclusion-explicate.

(January 1850.) — In Disjunctives there is always at least double the number of syllogisms (positive and negative) of the disjunct members; and in all syllogisms where the disjunct members are above two, as there is thus afforded the possibility of disjunctive explicates, there is another half to be added. Thus, if there be two disjunct members, as A—x B C, there are four syllogisms, but all of an absolute conclusion, — explicate. But if there be three disjunct members, as A—x B C D, in that case there are six absolute explicates, three positive and three negative, and, moreover, three disjunctivo-positive conclusions, — explicates, after a negative explicative, and so on.

### HYPOTHETICAL SYLLOGISM. — CANONS.

(February 1850.) — I. For *Breadth*, — The extensive whole or class being universally posited or sublated, every subjacent part is posited or sublated; or, for *Depth*, — All the comprehensive wholes being posited or sublated, the comprehended parts are universally posited or sublated.

II. For *Breadth*, — Any subjacent part being posited or sublated, the extensive whole or class is partially posited or sublated; or, for *Depth*, — Any comprehensive whole being posited or sublated, the comprehended parts (or part) are, *pro tanto*, posited or sublated, — Conversion and Restriction.

III. If one contradictory be posited or sublated, the other is sublated or posited. — Contradiction.

IV. If some or a part only of a notion be posited or sublated, all the rest (all other some) is sublated or posited, — Integration.

V. If the same under one correlation be posited or sublated, so under the other, — Equipollence.

VI. Law of Mediate Inference.[1] — Syllogism.

Mem. — The *some* in the explicand is (as in the Conversion of propositions) to be taken in the explicative as the *same some*. There is thus an inference equally from consequent to antecedent, as from antecedent to consequent.[2]

### HYPOTHETICALS, OR ALTERNATIVES.

### CONJUNCTIVE (HYPOTHETICALS EMPHATICALLY) AND DISJUNCTIVE (ALTERNATIVES EMPHATICALLY.)

(August 1852.)

Quantification, — *Any.*

Affirmative, — *Any (Anything, Aught)* contains under it every positive quantification, — *All* or *Every,* — *Some at least,* — *Some only,* — *This, These.* (Best.)

Negative, — *Not any, None, No (Nothing, Naught),* is equivalent to the most exclusive of the negations, *All not: All* or *every not: Not one,* and goes beyond the following, which are only partial negations, — *Not all; Not some; Some not.* (Worst.)

Affirmative, — *Any,* a highest genus and best; not so Negative — *Not any,* — a lowest species, and worst. Therefore can restrict, — subalternate in the former, not in the latter.

$$\underbrace{\overbrace{\text{— \textit{Any} (\textit{all} or \textit{every}, — \textit{some}).}}^{1}}_{\text{Pure affirmative.}} \qquad \underbrace{\overbrace{\text{\textit{Some not}, or \textit{not some}, or \textit{not all} — \textit{some only} (def.).}}^{2}}_{\text{Mixed affirmative and negative.}}$$

$$\underbrace{\overbrace{\text{\textit{All} or \textit{every not, not one, not any.}}}^{3}}_{\text{Pure negative.}}$$

*If any* (*every*) M *be an* (*some*) A, *and any* (*every*) A *an* (*some*) S, *then is any* (*every*) M *an* S; *and, v. v., if no* (*not any*) A *be any* S, *and any* M *some* A, *then is no* M *any* S.

∴ (On one alternative), *some* M *being some* A, *and all* A *some* S, *some* M *is some* S.

(On the other), *no* A *being any* S, *and every* M *some* A, *no* M *is any* S.

*If* (on any possibility) M *is, some* A *is; or, v. v., if no* A *is, no* M *is.*

∴ (on one alternative) (in this actuality), *some* M *being, some* A *is;* (*on the other*), *no* A *being, no* M *is.*

Possible M : , ▬▬ , A *or* A : ▬▬ : M. Supposition of universal Possibility. *In any case.*

Actual M , ▬▬ , A *or* A : ▬▬ : A. Assertion of particular Actuality. *In this case.*

From *Possible,* we can descend to *Actual;* from *Any,* to *Some;* but *Not any* being lowest or worst, we can go [no] lower.

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[1] See p. 536. — Ed.

[2] See p. 603. — Ed.

The *Possible* indifferent to Affirmation or Negation, it contains both implicitly. But when we descend to the *Actual* (and *Potential?*), the two qualities emerge. This explains much in both kinds of Hypotheticals or Alternatives, — the Conjunctives and Disjunctives.

Higher classes. — *Possible, Actual — Semper, quandocunque, tunc, nunc — Ubicunque, ubique, ibi, hoc — Any, all, some — In all, every, any case, in this case — Conceivable, real.*

### RULES OF HYPOTHETICAL SYLLOGISMS.

1. Universal Rule of Restriction. — What is thought of all is thought of some. — what is thought of the whole higher notion (genus) is thought of all and each of the lower notions (special or individual).

2. General Rule of both Hypotheticals. — What is thought (implicitly) of all, the Possible (genus), is thought (explicitly) of all and each, the Actual (species).

3 Special Rule of Conjunctives. — What is thought as consequent on every Possible, is thought as consequent on every Actual, antecedent.

4. Special Rule of Disjunctives. — What is thought as only Possible (alternatively), is thought as only Actual (alternatively).

5. Most Special Rule of Conjunctives. . . . . . . . . . . . . . . .

6. Most Special Rule of Disjunctives. . . . . . . . . . . . . . . .

### HYPOTHETICALS — EXAMPLES UNQUANTIFIED.

(Higher to Lower.)

| AFFIRMATIVE. | NEGATIVE. |
|---|---|
| *If the genus is, the species is.* | *If the genus is not, the species is not.* |
| *If the stronger can, the weaker can.* | *If the stronger cannot, the weaker cannot.* |

(Lower to Higher.)

| | |
|---|---|
| *If the species is, the genus is.* | *If the species is not, the genus is not.* |
| *If the weaker can, the stronger can.* | *If the weaker cannot, the stronger cannot.* |

(Equal to Equal.)

*If triangle, so trilateral.*

*Such poet Homer, such poet Virgil.*

*Where (when) the carcass is, there (then) are the flies.*

*If Socrates be the son of Sophroniscus, Sophroniscus is the father of Socrates.*

*If equals be added to equals, the wholes are equal.*

*If* A *be father of* B, B *is son of* A;

∴ A *being father of* B, B *is son of* A;

∴ B *not being son of* A, A *is not father of* B.

*If the angles be proportional to the sides of a* △:

∴ *An equiangular will be an equilateral* △.

*If wheresoever the carcass is, there will the eagles be gathered together* (Matt. xxiv. 28);

∴ *If here the carcass is, here,* etc.

### A.) — CONJUNCTIVE HYPOTHETICALS.

$$\text{1.) } \textit{If } \text{A } \textit{be } \text{D}, \textit{ it is } \Delta;\ \therefore \begin{cases} \text{A}, \textit{ being } \text{D}, \textit{ is } \Delta; \\ \text{A}, \textit{ not being } \Delta, \textit{ is not } \text{D}; \end{cases}$$

*In other words* — A *is either* D *or not* Δ D.

Identity and Contradiction.

$$\text{2.) } \textit{If } \text{B } \textit{be } \text{A}, \textit{ it is not non-}\text{A};\ \therefore \begin{cases} \text{B}, \textit{ being } \text{A}, \textit{ is not non-}\text{A}; \\ \text{B}, \textit{ being non-}\text{A}, \textit{ is not } \text{A}; \end{cases}$$

*In other words* — B *is either* A *or non*-A.

Excluded Middle.

$$\text{3.) } \textit{If } \text{B } \textit{be not } \text{A}, \textit{ it is non-}\text{A};\ \therefore \begin{cases} \text{B}, \textit{ not being } \text{A}, \textit{ is non-}\text{A}; \\ \text{B}, \textit{ being non-}\text{A}, \textit{ is not } \text{A}; \end{cases}$$

*In other words* — B *is either not* A *or not non*-A.

Excluded Middle.

$$\text{4.) } \textit{If } \text{E } \textit{be not } \text{D}, \textit{ it is not } \Delta;\ \therefore \begin{cases} \text{E}, \textit{ not being } \text{D}, \textit{ is not } \Delta; \\ \text{E}, \textit{ being } \Delta, \textit{ is } \text{D}; \end{cases}$$

*In other words* — E *is either not* D Δ, *or* Δ D.

Contradiction and Identity.

### B.) — DISJUNCTIVE HYPOTHETICALS.

$$\textit{If } \text{B } \textit{be either } \text{A } \textit{or non-}\text{A};\ \therefore \begin{cases} \text{B } \textit{being } \text{A}, \textit{ is not non-}\text{A}; \\ \text{B } \textit{being non-}\text{A}, \textit{ is not } \text{A}. \end{cases}$$

Excluded Middle.

"*If*" means *suppose that*, — *in case that*, — *on the supposition* — *hypothesis*, — *under the condition*, — *under the thought that*, — *it being supposed possible;*

∴ etc., means *then*, — *therefore*, — *in that case*, etc., etc., — *in actuality either*.

Only, properly, in both Conjunctives and Disjunctives, two contradictory alternatives. For contrary alternatives only material, not formal, and, in point of fact, *either* A *or* B *or* C means A *or non*-A, B *or non*-B, C *or non*-C.

The minor premise, on the common doctrine, a mere materiality. Formally, — logically, it is a mere differencing of the conclusion, which is by formal alternative afforded.

1.) In Hypotheticals (Conjunctive and Disjunctive), two or three hypotheses. The first is in the original supposition of *possibility*. (*If* B *be* A, *it is not non*-A — *If* B *be either* A *or non*-A.) The *second* (and *third*) is in the alternative suppositions of *actuality* (∴ *either if* B *be* A, *it is not non*-A, *or if* B *be non*-A, *it is not* A. — ∴ *If* B *be* A, *it is not non*-A, *or if* B *be non*-A, *it is not* A). (Possibly, — by possible supposition) *If man is, animal is;* ∴ (actually) *Man being, animal is;* (or) *animal not being, man is not.*

1.) Possibility — a genus indifferent to negative and affirmative. These two *species* of Possibility, to wit, two Actuals, — an actual yes, and an actual no. The total formal conclusion is, therefore, of two contradictories. This explains why, in Conjunctive and Disjunctive Hypotheticals, there are two alternative consequents, and only one antecedent.

2.) In Hypotheticals (Conjunctive and Disjunctive) a division of genus in the first supposition into two contradictories, — species. The inference, therefore, one of subalternation or restriction.

3.) In Hypotheticals (Conjunctive and Disjunctive), two alternative contradictory conclusions — the form giving no preference between the two, the matter only determining (other immediate inferences have only one determinate conclusion, and all mediate syllogism has virtually only one). Formally, therefore, we cannot categorically, determinately, assert, and assert exclusively, either alternative, and make a minor separate from the conclusion. This only materially possible; for we know not, by the laws of thought, whether a certain alternative is, knowing only that one of two alternatives must be. Formally, therefore, only an immediate inference, and that alternative double.

4.) Hypothetical (Conjunctive and Disjunctive) reasoning more marking out, — predetermining how a thing is to be proved, than proving it.

5.) Thus, three classes of inference: 1°, Simple Immediate Inference. — 2°, Complex Immediate Inference (Hypotheticals Conjunctive and Disjunctive). — 3°, Syllogisms Proper, Mediate Inference.

6.) If we quantify the terms, even the formal inference breaks down.

7.) The only difference between the first proposition and the two latter, is the restriction or subalternation. These last should, therefore, be reduced to one, and made a conclusion or restriction. The genera and species are of the most common and notorious kinds, as *Possible and Actual*, — *Wherever*, *Here*, etc., — *Whenever*, *Now*, — *All* or *Every*, *Some*, *This*, etc. The commonness and notoriety of this subordination is the cause why it has not been signalized; and if signalized, and overtly expressed, Hypotheticals might be turned into Categoricals. It is better, however, to leave them as immediate inferences. For it would be found awkward and round-about to oppose, for example, the Possible to the Actual, as determining a difference of terms. (See Molinæus, *Elem. Log.*, L. i. tr. iii. p. 95, and Pacius, *In Org.*, *De Syll. Hyp.*, p. 533.) The example of the *Cadaver* there given shows the approximation to the ordinary Hypotheticals. They may stand, in fact, either for Categoricals or Hypotheticals.

8.) Disjunctives — (Possibly) A *is either* B *or non*-B; ∴ (Actually) A *is either*, etc.

9) The doctrine in regard to the Universal Quantity, and the Affirmative Quality (see Krug, *Logik*, §§ 57, 83, 86, pp. 171, 264, 275), of the supposition, proposition, of Conjunctive (?) and Disjunctive Hypotheticals, is solved by my theory of *Possibility*. In it is virtually said (whatever quantity and quality be the clauses), — "*on any possible supposition.*" (On the Quality, v. Krug, *Logik*, § 57, p. 172. Pacius, *In Org.*, p. 533. Molinæus, *Elem. Log.*, *l. c.*)

10.) *Possibly*, — *problematically* includes as species the actual affirmative and the actual negative. It will thus be superfluous to enounce a negative in opposition to an affirmative alternative; for thus the possible would be brought down to the actual, and the whole syllogism be mere tautological repetition.

11.) The quantified terms, if introduced, must either be made determinate, to suit the Hypotheticals, or must ruin their inference. For example — *If all* *or some man be some animal*, we must be able to say, *But some animal is not, therefore man* (*any or some*) *is not.* But here *some animal*, except definitized into the *same some animal*, would not warrant the required inference. And so in regard to other quantifications, which the logicians have found it necessary to annul.

12.) The minor proposition may be either categorical or hypothetical. (See Krug, *Logik*, § 83, p. 264. Heerebord, *Instit. Logicar. Synopsis*, L. ii. c. 12, pp. 266, 267.) In my way of stating it: — *If man is, animal is*, ∴ *If man is* (or *man being*), *animal is.*

13.) Of notions in the relation of sub-and-superordination (as, in opposite ways Depth and Breadth, Containing and Contained), absolutely and relatively, the lower being affirmed, the higher are (partially) affirmed; and the higher being (totally) denied, the lower are (totally) denied. A, E, I, O, U, Y may represent the descending series.

The first proposition is conditional, complex, and alternative; we should expect that the second should be so likewise. But this is only satisfied on my plan; whereas, in the common, there is a second and a third, each categorical, simple, and determinate.

The subalternation is frequently double, or even triple, to wit, 1°, From the Possible to the Actual. 2° (for example), From *Everywhere* to *here*, or *this place*, or the place by name. 3°, From *all* to *some*, etc. — in fact, this inference may be of various kinds.

The μετάληψις of Aristotle may mean the determination, — the subalternation; the κατὰ ποιότητα may refer to the specification of a particular quality or proportion under the generic; and the πρόσληψις of Theophrastus (for the reading in Aristotle should be corrected) may correspond to the κατὰ ποιότητα.

There is no necessary connection, formally considered, between the antecedent and consequent notions of the Hypothetical major. There is, consequently, no possibility of an abstract notation; their dependence is merely supposed, if not material. Hence the logical rule, — *Propositio conditionalis nihil ponit in esse.* (See Krug, *Logik*, § 57, p. 166.) But on the formal supposition, — on the case thought, what are the rules? . . . . .

We should distinguish in Hypotheticals between a propositional antecedent and consequent, and a syllogistic A and C; and each of the latter is one proposition, containing an A and C.

The antecedent in an inference should be that which enables us formally to draw the conclusion. Show in Categoricals and in Immediate Inferences. On this principle, the conclusion in a Hypothetical will contain what is commonly called the minor proposition with the conclusion proper; but it will not be one and determinate, but alternative.

If there were no alternation, the inference would follow immediately from the fundamental proposition; and there being an alternative only makes the conclusion alternatively double, but does not make a mediate inference.

To make one alternative determinate is extralogical; for it is true only as materially proved. 1°, The splitting, therefore, of the conclusive proposition into two — a minor and a conclusion proper — is wholly material and extralogical; so also, 2°, Is the multiplying of one reasoning into two, and the dividing between them of the alternative conclusion.

Errors of logicians, touching Hypothetical and Disjunctive Reasonings:

1°, That [they] did [not] see they were mere immediate inferences.

2°, Most moderns that both Hypothetical.

3°, That both alternative reasonings in one syllogism.

4°, Mistook a part of the alternative conclusion for a minor premise.

5°, Made this a distinct part (minor premise), by introducing material considerations into a theory of form.

6°, Did not see what was the nature of the immediate inference in both, — how they resembled and how they differed.

## II. — Historical Notices.

### (CONJUNCTIVE AND DISJUNCTIVE.)

### (a) *ARISTOTLE.*

(August 1852.)

Aristotle (*Anal. Pr.* L. i. c. 32, § 5, p. 262, Pacii) describes the process of the Hypothetic Syllogism (that called by Alexander δι' ὅλων), but denies it to be a syllogism. Therefore his syllogisms from Hypothesis are something different. This has not been noticed by Mansel, Waitz, . . . . . .

Thus literally: — "Again, if *man* existing, it be necessary that *animal* exist, and if *animal*, that *substance*: *man* existing, it is necessary that *substance* exist. As yet, there is, however, no syllogistic process; for the propositions do not stand in the relation we have stated. But, in such like cases, we are deceived, by reason of the necessity of something resulting from what has been laid down; whilst, at the same time, the syllogism is of things necessary. But the Necessary is more extensive than the Syllogism; for though all syllogism be indeed necessary, all necessary is not syllogism." Why not? 1°, No middle. 2°, No quality, — affirmation or negation: problem, also not assertory, — hypothetical not syllogistic. 3°, No quantity. Compare, also, *An. Pr.* L. i. c. 24.

Aristotle (*Anal. Post.*, L. i. c. 2, § 15, p. 418; c. 10, §§ 8, 9, p. 438) makes *Thesis* or *Position* the genus opposed to *Axiom*, and containing under it, as species, 1°, *Hypothesis* or *Supposition*; and, 2°, *Definition.* Hypothesis is that thesis which assumes one or other alternative of a contradiction. Definition is that thesis which neither affirms nor denies. Hypothetical, in Aristotle's sense, is thus that which affirms or denies one alternative or other, — which is not indifferent to yes or no, — which is not possibly either, and, consequently, includes both. Hypotheticals, as involving a positive and negative alternative, are thus, in Aristotle's sense, rightly named, if divided; but, in Aristotle's sense, as complete, they are neither propositions nor syllogisms, as not affirming one alternative to the exclusion of the other.[1]

### (b) *AMMONIUS HERMIÆ.*

I. Ammonius Hermiæ, on *Aristotle Of Enouncement*, Introduction, f. 3, ed. Ald. 1546, f. 1. ed. Ald. 1503. After distinguishing the five species of Speech, according to the Peripatetics, — the *Vocative*, the *Imperative*, the *Interrogative*, the *Optative*, and the *Enunciative* or *Assertive*, — having further stated the corresponding division by the Stoics, and having finally shown that Aristotle, in this book, limited the discussion to the last kind, that alone being recipient of truth and falsehood, he thus proceeds: — " Again, of *Assertive* speech (ἀποφαντικοῦ λόγου), there are two species; the one called *Categoric* [or *Predicative*], the other *Hypothetic* [or *Suppositive*]. The Categoric denotes that *something does or does not belong to something:* as when we say, *Socrates is walking*, *Socrates is not walking;* for we predicate *walking* of *Socrates*, sometimes affirmatively, sometimes negatively. The Hypothetic denotes that *something being*, *something* [else] *is or is not*, or *something not being*, *something* [else] *is not or is:* As when we say, *If man be, animal also is*, — *If he be man, he is not stone.* — *If it be not day, it is night*, — *If it be not day, the sun has not risen.*

" The Categoric is the only species of Assertive speech treated of by Aristotle as that alone perfect in itself, and of utility in demonstration; whereas Hypothetic syllogisms, usurping [usually] without demonstration the [minor] proposition, called the *Transumption*, or *Assumption*, and sometimes even a [major premise] Conjunctive or Disjunctive, requiring proof, draw their persuasion from hypotheses, should any one [I read εἴ τις for ἥτις] concede their primary suppositions. If, then, to the establishment of such suppositions we should employ a second hypothetic syllogism, — in that case, we should require a further establishment for confirmation of the suppositions involved in it; for this third a fourth would again be necessary; and so on to infinity, should we attempt by hypotheses to confirm hypotheses. But to render the demonstration complete and final, it is manifest that there is needed a categoric syllogism to prove the point in question, without any foregone supposition. Hence it is that Categoric [reasonings] are styled *Syllogisms* absolutely; whereas Hypothetic [reasonings] of every kind are always denominated *Syllogisms from hypothesis*, and never Syllogisms simply. Add to this, that Hypothetic enouncements are made up of Categoric. For they express the consequence or opposition (ἀκολουθίαν ἢ διάστασιν) of one Categoric proposition and another, uniting them with each other by either the Conjunctive or Disjunctive particle (συμπλεκτικῷ ἢ διαζευκτικῷ συνδέσμῳ), in order to show that they constitute together a single enouncement. For these reasons, therefore, Aristotle has only considered, in detail, the Categoric species of Assertive speech."

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[1] [Whether the *Syllogisms ex hypothesi* of Aristotle are correspondent to the ordinary Hypothetical Syllogism.

For the affirmative, see Pacius, *Com. In Org An. Prior*, L i. cc. 23, 29. 44, pp. 153, 177, 194. St Hilaire, *Translation of Organon*, vol. ii. pp. 107. 139, 178.

For the negative, see Piccartus, *In Org. An. Prior.* L. i. cc. 40, 41, 42, p. 500. Neldelius, *De Usu Org. Arist.* P. iii. c. 2, pp. 38, 45 (1607). Keckermann, *Opera*, pp. 766, 767. Scheibler, *Opera Logica Tract. Syll.* P. iv. c. x. tit. 2, p. 548. Bursgersdicius, *Instit. Log.* L. ii. cc. 12, 14, pp. 263. 270, 275 Ritter, *Gesh der Phil.* iii. p. 96. (Eng. Tr., p 80.) Ramus, *Scholæ Dial.* L. vii. cc. 12, 13 pp 492, 503 Molinæus, *Elementa Logica*, p. 95 *et seq.* Waitz, *Org.* i. pp. 427, 433 Cf. Alexander, *In An. Prior.* ff. 88, 109. Philoponus, *In An. Prior*, ff. $60^a$, $60^b$, $87^b$, 88. Anonymus, *De Syllogismo*, f. $44^b$. Magentinus, *In An. Prior*, f. $17^b$. Ammonius, *In de Interp.*, $3^b$. Blemmidas, *Epit. Log.* c. 36.]

### (c) *ANONYMOUS SCHOLION.*[1]

In Hypothetic Syllogisms, the first [I] are those of two terms [a], Conjunctive, or [b] Disjunctive (ὅροι οἱ συνημμένοι ἢ διαλελυμένοι); then follow [II] the two [classes of] syllogisms with three, and these conjunctive terms.

[I. a.] "There are four syllogisms through the Return (ἡ ἐπάνοδος) on the prior (ὁ πρότερος, ὁ πρῶτος) [or antecedent clause of the hypothetical proposition], and four through it on the posterior (ὁ δεύτερος, ὁ ἔσχατος). For the terms are taken either both affirmatively or both negatively. And the return upon the prior is ponent (κατὰ θέσιν), upon the posterior tollent (κατὰ ἀναίρεσιν). For example [the return upon the prior]:

(1.) *If* A *is*, B *is*; (Return) *but* A *is*; (Conclusion, συμπέρασμα) *therefore*, B *is*.
(2.) *If* A *is*, B *is not*; *but* A *is*; *therefore*, B *is not*.
(3.) *If* A *is not*, B *is*; *but* A *is not*; *therefore*, B *is*.
(4.) *If* A *is not*, B *is not*; *but* A *is not*; *therefore*, B *is not*.

"The return upon the posterior:

(1.) *If* A *is*, B *is*; *but* B *is not*; *therefore*, A *is not*.
(2.) *If* A *is*, B *is not*; *but* B *is*; *therefore*, A *is not*.
(3.) *If* A *is not*, B *is*; *but* B *is not*; *therefore*, A *is*.
(4.) *If* A *is not*, B *is not*; *but* B *is*; *therefore*, A *too is*.

[b.] "Following those of conjunctive, are syllogisms of disjunctive terms. In these, the return is upon either [clause] indifferently. For example: *If it must be that either* A *is or* B *is* [in the one case]; B *is not*, *therefore*, A *is*; or [in the other], A *is not*, *therefore* B *is*.

[II.] "Of three conjunctive terms, there are [in the figures taken together] eight syllogisms, through a return on the prior, and eight [sixteen][2] through a return on the posterior [clause]. For the three terms are correlated (συντίθενται), either all affirmatively, or some; and here either the third alone, or the third and second, or the second alone, negatively. Again, either all are negatively correlated, or some; and here the third alone, or the third and second, or the second alone, affirmatively. In this manner the correlation [in each figure] is eightfold; taking for exemplification only a single mood [in the several figures]:

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[1] In Waitz, *Org.* I. pp 9, 10.

[2] It would seem that the author here, and in the last sentence, discounts altogether the first figure, puzzled, apparently, to which premise (the minor placed first, according to the common practice of the Greeks, or the major prior, in Aristotelic theory) he should accord the designation of first.

*If* A *is*, B *is;*
*If* B *is*, C *is;*
*If* A *is, therefore*, C *is.*

This is of the first figure. For the middle collative term (ὁ συνάγων ὅρος μέσος) is twice taken, being the consequent (ὁ λήγων) in the former conjunctive [premise] (τὸ πρότερον συνημμένον), the antecedent (ὁ ἡγούμενος) in the latter. Wherefore, these syllogisms are indemonstrable,[1] not requiring reduction (ἡ ἀνάλυσις) for demonstration. The other moods of the first figure are, as has been said, similarly circumstanced.

"The second figure is that in which the collative term [or middle] (ὁ συνάγων) holds the same relation to each of the collated [or extreme] terms, inasmuch as it stands the antecedent of both the conjunctive [premises], except that in the one it is affirmative, in the other negative. Wherefore, when reduced to the first figure, they demonstrate, as is seen, through the instance of a single mood composed of affirmative collated terms. As —

*If* A *is*, B *is;*
*If* A *is not*, C *is;*
*If* B *is not, therefore*, C *is.*

"This is reduced to the first figure in the following manner: — Whether it has the collated terms, both affirmative, or both negative, or both dissimilar to the reciprocally placed collative term, there is taken in the reduction the opposite [and converse] of the prior conjunctive [premise]; and the latter is applied, in order that the opposite of the consequent in the former conjunctive [premise] may find a place in the foresaid mood. As —

*If* B *is not*, A *is not;*
*If* A *is not*, C *is;*
*If* B *is not, therefore*, C *is.*

"This it behooved to show.

"The third figure is that in which the collative term holds the same relation to each of the collated terms, being the consequent in either conjunctive [premise] affirmatively and negatively, as in the example of a single mood again consisting of affirmative collated terms. Thus:

*If* A *is*, B *is;*
*If* C *is*, B *is not;*
*If* A *is, therefore*, C *is not.*

"The reduction of this to the first figure is thus effected. The opposite [a converse E] of the second conjunctive [premise] is taken along with the first conjunctive [premise], and the antecedent of the former is applied to the opposite of the latter's consequent; as in the foresaid mood. Thus:

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[1] Vide Apuleius. [*De Dogm. Plat* iii. p. 37. Elm. Cf. *Discussions*, p. 836. — Ed.]

*If* A *is*, B *is*;
*If* B *is*, C *is not*;
*If* A *is, therefore*, C *is not.*

"All this requires to be shown concretely. As in the first figure [first mood]:

*If day is, light is;*
*If light is, visible objects are seen;*
*If day is, therefore, visible objects are seen.*

"Second figure, first mood:

*If day is, light is;*
*If day is not, the sun is under the earth;*
*If light is not, the sun is [therefore] under the earth.*

"Reduction:

*If light is not, day is not;*
*If day is not, the sun is under the earth;*
*If light, therefore, is not, the sun is under the earth.*

"Third figure, first mood:

*If day is, light is;*
*If things visible are unseen, light is not;*
*If day, therefore, is, things visible are not unseen.*

"There are eight moods of the second figure, and eight of the third; two composed of affirmatives, two of negatives, four of dissimilars, with a similar or dissimilar collative.

"End of Aristotle's Analytics."

Relative to the translation from the Greek interpolator on Hypothetical Syllogisms, in Waitz (*Org.* i. p. 9, 10); and in particular to the beginning of [II].

Better thus: — In all the Figures: — the quality of the syllogism is either *Pure*, — and here two, viz., one affirmative and one negative; or *Mixed*, — and here six, viz., three in which affirmation, and three in which negation, has the preponderance.

The following are thus arranged :

| | | First Figure. | Second Figure. | Third Figure. |
|---|---|---|---|---|
| Affirmation of parts preponderant. | All<br>A | *If* A *is*, B *is* ;<br>*If* B *is*, C *is*;<br>∴ *If* A *is*, C *is*. | *If* B *is*, A *is* ;<br>*If* B *is*, C *is* ;<br>∴ *If* A *is*, C *is*. | *If* A *is*, B *is*;<br>*If* C *is*, B *is*;<br>∴ *If* A *is*, C *is*. |
| | 1, 2,<br>B | *If* A *is*, B *is* ;<br>*If* B *is*, C *is not* ;<br>∴ *If* A *is*, C *is not*. | *If* B *is*, A *is* ;<br>*If* B *is*, C *is not* ;<br>∴ *If* A *is*, C *is not*. | *If* A *is*, B *is* ;<br>*If* C *is not*, B *is* ;<br>∴ *If* A *is*, C *is not*. |
| | 1, 3,<br>C | *If* A *is*, B *is not* ;<br>*If* B *is not*, C *is* ;<br>∴ *If* A *is*, C *is*. | *If* B *is not*, A *is* ;<br>*If* B *is not*, C *is* ;<br>∴ *If* A *is*, C *is*. | *If* A *is*, B *is not* ;<br>*If* C *is*, B *is not* ;<br>∴ *If* A *is*, C *is*. |
| | 2, 3,<br>D | *If* A *is not*, B *is* ;<br>*If* B *is*, C *is* ;<br>∴ *If* A *is not*, C *is*. | *If* B *is*, A *is not* ;<br>*If* B *is*, C *is* ;<br>∴ *If* A *is not*, C *is*. | *If* A *is not*, B *is* ;<br>*If* C *is*, B *is* ;<br>∴ *If* A *is not*, C *is*. |
| Negation of parts preponderant; But affirmative in general. | All<br>E | *If* A *is not*, B *is not*.<br>*If* B *is not*, C *is not* ;<br>∴ *If* A *is not*, C *is not*. | *If* B *is not*, A *is not* ;<br>*If* B *is not*, C *is not* ;<br>∴ *If* B *is not*, C *is not*. | *If* A *is not*, B *is not* ;<br>*If* C *is not*, B *is not* ;<br>∴ *If* A *is not*, C *is not*. |
| | 1, 2,<br>F | *If* A *is not*, B *is not* ;<br>*If* B *is not*, C *is* ;<br>∴ *If* A *is not*, C *is*. | *If* B *is not*, A *is not* ;<br>*If* B *is not*, C *is* ;<br>∴ *If* A *is not*, C *is*. | *If* A *is not*, B *is not* ;<br>*If* C *is*, B *is not* ;<br>∴ *If* A *is not*, C *is*. |
| | 1, 3,<br>G | *If* A *is not*, B *is* ;<br>*If* B *is*, C *is not* ;<br>∴ *If* A *is not*, C *is not*. | *If* B *is*, A *is not* ;<br>*If* B *is*, C *is not* ;<br>∴ *If* A *is not*, C *is not*. | *If* A *is not*, B *is* ;<br>*If* C *is not*, B *is* ;<br>∴ *If* A *is not*, C *is not*. |
| | 2, 3,<br>H | *If* A *is*, B *is not* ;<br>*If* B *is not*, C *is not* ;<br>∴ *If* A *is*, C *is not*. | *If* B *is not*, A *is* ;<br>*If* B *is not*, C *is not* ;<br>∴ *If* A *is*, C *is not*. . | *If* A *is*, B *is not* ;<br>*If* C *is not*, B *is not* ;<br>∴ *If* A *is*, C *is not*. |

These eight syllogisms are all affirmative, the negation not being attached to the principal copula.[1] If, therefore, the negation be attached to one or other premise, there will be sixteen negative syllogisms, in all twenty-four. The negatives are, however, awkward and useless. (See Lovanienses, p. 301.)

But each of these twenty-four syllogisms can receive twelve different forms of predesignation, corresponding to the twelve moods of the simple categorical; according to which they are arranged and numbered. It is hardly necessary to notice that the order of the premises is in comprehension, after the Greek fashion of the scholiast.

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[1] See Lovanienses, *In Arist. Dial.*, *Tract. de Hypotheticis Syllogismis*, p. 299.

| | i. | ii. | iii. | iv. | v. | vi. | vii. | viii. | ix. | x. | xi. | xii. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Γ A | : | , | , | : | : | , | : | , | , | : | , | , |
| M B | : : | : : | : : | : : | , : | : , | , : | : , | , : | : , | , : | : , |
| C C | : | , | : | , | : | : | , | : | : | , | , | , |

This is exemplified in the Syllogism E of the preceding table, thus:

1. *If all* A *is not, all* B *is not; if all* B *is not, all* C *is not;* ∴ *if all* A *is not, all* B *is not.*
2. *If some* A *is not, all* B *is not; if all* B *is not, some* C *is not;* ∴ *if some* A *is not, some* C *is not.*
3. *If some* A *is not, all* B *is not; if all* B *is not, all* C *is not;* ∴ *if some* A *is not, all* C *is not.*
4. *If all* A *is not, all* B *is not; if all* B *is not, some* C *is not;* ∴ *if all* A *is not, some* C *is not;*
5. *If all* A *is not, some* B *is not; if all* B *is not, all* C *is not;* ∴ *if all* A *is not, all* C *is not.*
6. *If some* A *is not, all* B *is not; if some* B *is not, all* C *is not;* ∴ *if some* A *is not, all* C *is not.*
7. *If all* A *is not, some* B *is not; if all* B *is not, some* C *is not;* ∴ *if all* A *is not, some* C *is not.*
8. *If some* A *is not, all* B *is not; if some* B *is not, all* C *is not;* ∴ *if some* A *is not, all* C *is not.*
9. *If some* A *is not, some* B *is not; if all* B *is not, all* C *is not;* ∴ *if some* A *is not, all* C *is not.*
10. *If all* A *is not, all* B *is not; if some* B *is not, some* C *is not;* ∴ *if all* A *is not, some* C *is not.*
11. *If some* A *is not, some* B *is not; if all* B *is not, some* C *is not;* ∴ *if some* A *is not, some* C *is not.*
12. *If some* A *is not, all* B *is not; if some* B *is not, some* C *is not;* ∴ *if some* A *is not, some* C *is not.*

# IX.

## SORITES.

(See p. 274.)

(Without order.)

All logicians have overlooked the Sorites of Second and Third Figures.

In Sorites of the Second or Third Figures, every term forms a syllogism with every other, through the one middle term. In Sorites of the First Figure, every Second term at most forms a syllogism with every other, through its relative middle term.

No subordination in Sorites of Second or Third Figure, *ergo* no one dominant conclusion.

Alias — In First Figure, there being a subordination of notions, there may be a Sorites with different middles (all, however, in a common dependency). In Second and Third Figures, there being no subordination of terms, the only Sorites competent is that by repetition of the same middle. In First Figure there is a new middle term for every new progress of the Sorites; in Second and Third, only one middle term for any number of extremes.

In First Figure, a Syllogism only between every second term of the Sorites, the intermediate term constituting the middle term. In the others, every two propositions of the common middle term form a syllogism.

Alias — There being no subordination in Second and Third Figures between the extremes, there, consequently, are —

1°, No relations between extremes, except through the middle term.

2°, There is only one possible middle term; any number of others.

3°, Every two of the terms, with the middle term, may form a syllogism.

4°, No order.

Before concluding this subject, I would correct and amplify the doctrine in regard to the Sorites.[1]

1°, I would state that, by the quantification of the Predicate (of which we are hereafter to treat, in reference to reasoning in general), there are two kinds of Sorites; the one descending from whole to part, — or ascending from part to whole; the other proceeding from whole to whole: of which last it is now alone requisite to speak. It is manifest, that if we can find two notions wholly equal to a third notion, these notions will be wholly equal to each other. Thus, if all trilateral figure be identical with all triangular figure, and all triangular figure with all figure the sum of whose internal angles is equal to two right angles, then all figure, the sum of whose internal angles is equal to two right angles, and all trilateral figure, will also be identical, reciprocating, or absolutely convertible. We have thus a simple syllogism of absolute equation. On the same principle, if A and B, B and C, C and D, are absolutely equivalent, so also will be A and D. We may thus, in like manner, it is evident, have a Sorites of absolute equivalents. It is not, indeed, very easy always to find four or more terms or notions thus simply convertible. In geometry, we may carry out the concrete syllogism just stated, by adding the three following propositions: —*All figure, the sum of whose internal angles is equal to two right angles, is all figure which can be bisected through only one angle; —All figure which can be bisected through only one angle, is all figure which, bisected through an angle and a side, gives two triangles;* and *All figure which, thus bisected, gives two triangles, is all figure which, bisected through two sides, gives a triangle and a quadrangle; and so forth.* In theology, perhaps, however, these series are more frequently to be found than in the other sciences. The following twelve equivalent concepts constitute at once a good example of such a Sorites, and at the same time exhibit a compendious view of the whole Calvinistic doctrine. These are, — 1. *Elected;* 2. *Redeemed;* 3. *Called;* 4. *Graced with true repentance:* 5. *With true faith;* 6. *With true personal assurance;* 7. *Pardoned;* 8. *Justified:* 9. *Sanctified;* 10. *Endowed with perseverance;* 11. *Saved;* 12. *Glorified.* This series could indeed be amplified; but I have purposely restricted it to twelve. Now, as *All the elect are all the redeemed, all the redeemed all the called, all the called all the [truly] penitent, all the [truly] penitent all the [truly] believing, all the [truly] believing all the [truly] assured, all the [truly] assured all the pardoned, all the pardoned all the justified, all the justified all the sanctified, all the sanctified all the perseverant, all the perseverant all the saved, all the saved all the glorified, all the glorified all the blest with life eternal;* it follows, of necessity, that *all the blest with life eternal are all the elect.* To turn this affirmative into a negative Sorites, we have only to say, either at the beginning, — *None of the reprobate are any of the elect,* and, consequently, infer, at the end, that *none of the blessed with eternal life are any of the reprobate;* or, at the end, — *None of the blest with eternal life are any of the punished,* and, consequently, infer that *none of the punished are any of the elect.* Perhaps the best formula for this kind of Sorites is to be found in the letters a, b, c. This will afford us a Sorites of six terms, viz., a, b, c—a, b—b, a, c—b, c, a—c, a, b—c, b, a,—which are all virtually identical in their contents. If there be required a formula for a longer Sorites, we may take the letters a, b, c, d, which will afford us twenty-four terms. Perhaps the best formula for a descending or ascending Sorites is, for example, a, b, c, d, e, f—a, b, c, d, e,—a, b, c, d,—a, b, c,—a, b,—a.

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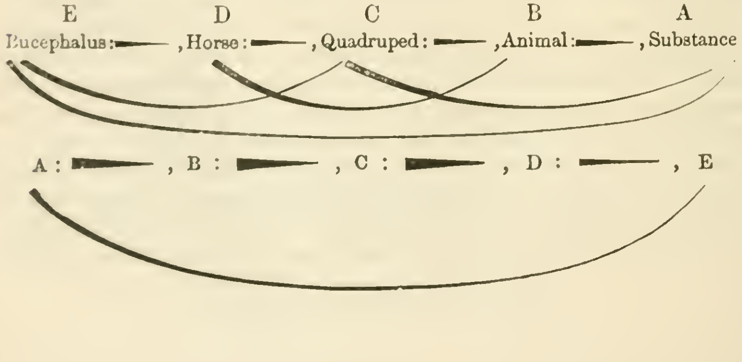
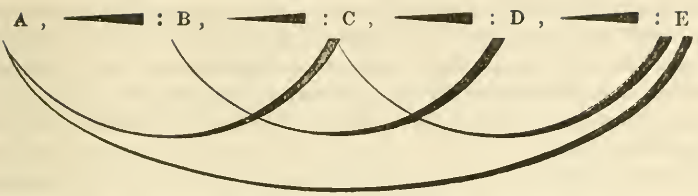
[1] Interpolation in *Lectures*. See p. 274. — ED.

I. — COMPREHENSIVE SORITES — PROGRESSIVE AND REGRESSIVE.


E
D
C
B
A
Bucephalus : ——— , Horse : ——— , Quadruped : ——— , Animal : ——— , Substance
A : ——— , B : ——— , C : ——— , D : ——— , E

### II. — EXTENSIVE SORITES.



# X.

## SYLLOGISM.

### I. — Its Enouncement — Analytic and Synthetic — Order of Premises.

(See p 281.)

#### (a) ENOUNCEMENT OF SYLLOGISM.

(Nov. 1848.) — There are two orders of enouncing the Syllogism, both natural, and the neglect of these, added to the not taking into account the Problem, or Question, has been the ground why the doctrine of syllogism has been attacked as involving a *petitio principii*, or as a mere tautology. Thus, Buffier cites the definition *the art of confessing in the conclusion what has been already avowed in the premises*.[1] This objection has never been put down.

The foundation of all syllogism is the Problem. But this may be answered either Analytically or Synthetically.

1. *Analytically* (which has been wholly overlooked) thus, — Problem or quæsitum, *Is* Γ C? Answer, Γ *is* C; *for* Γ *is* M, *and* M *is* C. This is the reasoning of Depth. More explicitly: — Does Γ *contain in it* C? Γ *contains in it* C; *for* Γ *contains in it* M, *and* M *contains in it* C. But it is wholly indifferent whether we cast it in the reasoning of Breadth. For example: — *Does* C *contain under it* Γ? C *contains under it* Γ; *for* C *contains under it* M, *and* M *contains under it* Γ.[2]

Here all is natural; and there is no hitch, no transition, in the order of progressive statement. The whole reasoning forms an organic unity; all the parts of it being present to the mind at once, there is no before and no after. But it is the condition of a verbal enouncement, that one part should precede and follow another. Here, accordingly, the proposition in which the reasoning is absolved or realized, and which, from the ordinary mode of enouncement, has been styled the *Conclusion*, is stated first; and the grounds or reasons on which it rests, which, from the same circumstance, have been called the *Premise* or *Antecedent*, are stated last. This order is Analytic. We proceed from the effect to the cause, — from the principiatum to the principia. And it is evident that this may be done indifferently either in Depth or Breadth; the only difference being that in the counter quantities the grounds or premises naturally change their order.

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[1] *Seconde Logique*, Art iii. § 126. — Ed.

[2] Plato, in a letter to Dionysius (*Epist.* 2), reverses the common order of Syllogism, placing the conclusion first (*that he thinks there is some sense in the dead*), then the minor (*that good men so think*), lastly the major (*that the presentiments of divine men are of highest authority*). *Platonis Opera*, Bekker. ix. p. 74 Cf. Melanchthon, *Dialectica*, L. iii., *De Figuratione*, p. 93, ed 1542.

II. *Synthetically*, — the only order contemplated by the logicians as natural, but on erroneous grounds. On the contrary, if one order is to be accounted natural at the expense of the other, it is not that which has thus been exclusively considered. For —

1°, It is full of hitches. There is one great hitch in the separation of the conclusion from the question; though this latter is merely the former proposition in an assertive, instead of an interrogative, form. There is also at least one subordinate hitch in the evolution of the reasoning.

2°, The exclusive consideration of this form has been the cause or the occasion of much misconception, idle disputation, and groundless objection.

(On the two Methods; tumultuary observations, to be better arranged, and corrected.)

1°, In the first or analytic order, what is principal in reality and in interest is placed first, that is, the Answer or Assertion, called on the other order the *Conclusion*.

2°, In this order all is natural; there is no hitch, no saltus, no abrupt transition: all slides smoothly from first to last.

a) The question slides into its answer, interrogation demands and receives assertion.

b) Assertion requires a reason, and prepares us to expect it; and this is given immediately in what, from the other order, has been called the *Antecedent* or *Premises*.

c) Then the first term, either in Breadth or Depth, is taken first in the ground or reason, and compared with M; then M is compared with the other. As in Breadth: — *Does* C *contain under it* Γ? C *contains* Γ; *for* C *contains under it* M, *and* M *contains under it* Γ. In Depth — *Does* Γ *contain in it* C? Γ *contains in it* C; *for* Γ *contains in it* M, *and* M *contains in it* C. This is the first Figure. Second Figure, using common language: — *Is* Γ C? Γ *is* C (*and* C *is* Γ); *for* Γ *and* C *are both the same* M. Here the two extremes taken together are compared with M. In the third Figure M is compared with both extremes — *Is* Γ C? Γ *is* C (*and* M *is* Γ); *for the same* M *is both* Γ *and* C.

3°, In this order there is nothing pleonastic, nothing anticipated.

4°, Nothing begged.

5°, In this method the process is simple. Thought is one; but to be enounced it must be analyzed into a many. This order gives that necessary analysis, and nothing more.

6°, In this order, when assertive, answer is limited by question; good reason why, in Second and Third Figures, one answer should be given.

7°, This order is the one generally used by the mathematicians. (See Twesten, *Logik, insbesondere die Analytik*, § 117, p. 105, and below, p. 626. Plato also).

8°, If the Quæsitum be stated as it ought to be, this order follows of course; and the neglect of the quæsitum has followed from the prevalence of the other. If the quæsitum be stated in using the common form, we must almost of course interpolate a yes or a no before proceeding to the premises in the common method; and in that case, the conclusion is only a superfluous recapitulation.

In the Synthetic, or common order, all is contrary. (The numbers correspond.)

1°, In this order, what is first in reality and interest, and in and for the sake of which the whole reasoning exists, comes last; till the conclusion is given we know not (at least we ought not to know) how the question is answered.

2°, In this order all is unnatural and contorted by hitches and abrupt transitions. There is no connection between the question and what prepares the answer, — the premise. (Show in detail.)

3°, In this order all is pleonastic and anticipative. The premises stated, we already know the conclusion. This, indeed, in books of Logic, is virtually admitted, — the conclusion being commonly expressed by a *therefore*, etc. Ancient doctrine of Enthymeme (Ulpian, etc.), unknown to our modern logicians; among their other blunders on the Enthymeme. On the common doctrine, Logic — Syllogistic — is too truly defined the art of confessing in the conclusion what had been already avowed in the premises.

4°, On this order the objection of *petitio principii* stands hitherto unrefuted, if not unrefutable, against Logic.[1]

5°, In this order the process is complex. The simple thought is first mentally analyzed, if it proceed, as it ought, from the quæsitum; but this analysis is not expressed. Then the elements are recomposed, and this recomposition affords the synthetic announcement of the syllogism, — the syllogism being thus the superfluous regress of a foregone analysis. Aristotle's analytic is thus truly a synthetic; it overtly reconstructs the elements which had been attained by a covert analysis.[2]

6°, In this method, the problem hanging loose from the syllogism, and, in fact, being usually neglected, it does not determine in the Second and Third Figures one of the two alternative conclusions which, *ex facie syllogismi*, are competent in them. The premises only being, there is no reason why one of the conclusions should be drawn to the preference of the other. *Mem.* Counter-practice old and new. The logicians ought not, however, to have ignored this double conclusion.

7°, See corresponding number.

8°, See corresponding number.[3]

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[1] [Stewart (*Elements*, vol. ii. ch. 3, § 2, *Works*, vol. iii. p 202, *et alibi*) makes this objection. Refuted by Galluppi, *Lez. di Logica e di Metafisica*, Lez. i. p. 242, *et seq.*]

[2] [Aristotle's *Analytics* are in synthetic order; they proceed from the simple to the compound; the elements they commence with are gained by a foregone analysis, which is not expressed. They are as synthetic as a grammar commencing with the letters. The meaning of the term is the doctrine showing how to analyze or reduce reasonings to syllogisms; syllogisms to figure; figure to mood; second and third figures to first; syllogisms to propositions and terms; propositions to terms; for of all these analysis is said. See *Pacci Organon*, *An. Prior*, i cc. 2, 32, 42, 44, 45, pp. 128, 261, 273, 275, 278, 280.]

[3] Compare *Discussions*, p. 652. — Ed.

### *(b) ORDER OF PREMISES.*

Aristotle places the middle term in the first Figure between the extremes, and the major extreme first; — in the second Figure before the extremes, and the major extreme next to it; — in the third Figure, after the extremes, and the minor extreme next to it.

In his mode of enouncement this relative order is naturally kept; for he expresses the predicate first and the subject last, thus: A *is in all* B, or A *is predicated of all* B, instead of saying *All* B *is* A.

But when logicians came to enounce propositions and syllogisms in conformity to common language, the subject being usually first, they had one or other of two difficulties to encounter, and submit they must to either; for they must either displace the middle term from its intermediate position in the first Figure, to say nothing of reversing its order in the second and third; or, if they kept it in an intermediate position in the first Figure (in the second and third the Aristotelic order could not be kept), it behooved them to enounce the minor premise first.

And this alternative actually determined two opposite procedures, — a difference which, though generally distinguishing the logicians of different ages and countries into two great classes, has been wholly overlooked. All, it must be borne in mind, regard the syllogism in Figure exclusively, and as figured only in Extension.

The former difficulty and its avoidance determined the older order of enouncement, that is, constrained logicians to state the minor premise first in the first Figure; and, to avoid the discrepancy, they of course did the same for uniformity in the second and third. Such is the order.

The latter difficulty and its avoidance determined the more modern order of enouncement, that is, constrained logicians to surrender the position of the middle term as middle, in following the order of the major premise first in all the Figures.

Philoponus on the First Book of the *Prior Analytics*, c. iv. § 4 (Pacian Division), f. xx. ed. Trincavelli. — "This definition appears to be of the extremes and of the middle term; but is not. It behooves, in addition, to interpolate in thought an '*only;*' and thus will it be rightly enounced, as if he had said: — *But the extremes are both that which is only in another, and that in which another only is.* For if A is [predicated] of all B, and B is [predicated] of all C, it is necessary that A should be predicated of all C. This is the first syllogistic mood. Two universal affirmatives, inferring a universal conclusion. For if B is in all C, consequently C is a part of B; but again B is a part of A; consequently, A is in all C, inasmuch as C is a part of B. But what is here said will appear more clearly from a concrete example — *Substance of all animal; animal of all man;* (there follows) *substance of all man.* And backwards (ἀνάπαλιν), *All man animal; all animal substance; all man therefore substance.* In regard to this figure, it is plain how we ought to take the terms of the first mood. The first [major] is most generic; the second [middle] is a subaltern genus; and the third [minor] is a species more special than the middle. But a conclusion is here always necessary. Thus, following the synthetic order, that is, if we start from the major term, *substance* begins, beginning also the conclusion. *Substance of all animal* (*substance* stands first); *animal of all man;* (finally the conclusion commences with *substance*) — *substance of all man.* But if [on the analytic order] we depart from the minor term, as from *man*, in this case the conclusion will, in like manner, begin therewith: *All man animal; all animal substance: all man substance.*"

This is the only philosophic view of the matter. His syllogisms really analytic ( = in Depth).

*Analytic* and *Synthetic* ambiguous. Better, — order of *Breadth* and *Depth.*[1]

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[1] [Instances and authorities for the enouncement of Syllogism, with the Minor Premise stated first:

ANCIENTS.

*Greeks:* — Gregory of Nyssa, *Opera*, t. ii. p. 612. in his 12 (not 10) Syllogisms against Manicheans, varies. These very corrupt. Joannes Damascenus (*Dialectica*, c. 64, *Opera*, ed. Lequien, Paris, 1712, t. i. pp. 65, 66) gives two Syllogisms, one with minor first. Alcinous, *De Doct. Plat* L. i. cc. 5 and 6. Aristotle often places minor first. See Zabarella, *Opera Logica*, *De Quarta Figura*, p. 124 Vallius, *Logica*, t. ii, pp. 72, 76. Aristotle and Alexander not regular in stating major propositions. See in First Figure, *An. Pr.* i. c. 4. Aristotle used the "*whole*" only of the predicate. See Zabarella, *Tabulæ*. *In An. Prior*, p. 149. (But see above, p. 548) Boethius, *Opera*, pp. 562. 583 Aristotle, *An Pr.* i. c 1, *sub fin.*, ubi Alexander, f. 9 a. Philoponus, f. 17 a. t 11 b. Alexander Aph *In An. Pr.* i ff. 9 a, 15 b. Philoponus, *In An Pr.* i. ff. 11 b, 20 a, explains the practice of Greek Peripatetics in this matter. See also ff. 17 a. 18 a; and 11, 21 a — these in i Fig. — in ii. Fig 23 b. The same *In Physica*, i. c 1. f. 2 Themistius, *In An. Post.* ii. c 4. Anonymus, *De Syllogismo*, f. 43 a. Gregorius Aneponymus, *Compend. Philosophiæ Syntagma*, L. v cc. 1, 6, pp. 58, 70. Georgius Diaconus Pachymerius, *Epit. Log.* tit. iv. cc. 1—4. Sextus Empiricus, *Pyrrh. Hypotypos.*, L. ii. cc. 13, 14. pp 103, 110. Clemens Alex. *Strom* L. viii *Opera*, p. 784 (ed. Sylburgii) Blemmidas, *Epitome Logica*, c. 31, p. 219. Gregorius Trapezuntius, *Dialectica*, *De Syll.* p. 30. "Prima (Figura) est in qua medius terminus subjicitur in majore, et in minore prædicatur: *quamvis contra fieri et soleat et possit.*" A Greek, he wrote in Italy for the Latins; but refers here to the practice of his countrymen.

*Latins:* — Cicero, *De Fin.* iii. 8; iv. 18. *Tusc. Disp.* iii 7; v. 15, *Opera Phil.* pp. 885, 903, 981, 1029, ed. Verburgii. Macrobius, *Opera*, p. 181, Zeunii. Seneca, *Epist.* 85, p. 368. Apuleius, *De Habit. Doct Plat.* L. iii. p 36, ed. Elmenhorst. Isidorus in *Gothofr. Auctores*, p. 878. Cassiodorus, *Dialectica*, *Opera*, p. 556, Genev. 1650, gives alternative, but in Psalm xxxi. v. 16, gives a syllogism with minor first. Martianus Capella, *De Septem Artibus Liberalibus*, allows both forms for first Figure; generally makes the minor first (see below, p. 640). Boethius (origo mali), v. *Opera*, p. 594 *et seq.*

ORIENTALS.

*Mohammedans:* — Averroes (enouncing as we) in all the Figures, has minor first. (See below, p. 640)

*Jews:* — Rabbi Simeon [truly Maimonides] (in Hebrew), *Logica*, per S. Munsterum, cc. 6, 7, Basil, 1527.

Modern anticipations of the doctrine that the Minor Premise should precede the Major, Valla, *Dialectica*, f 60 b, etc. *Opera*, pp. 733, 736. Joannes Neomagus, *In Trapezuntium*, f. 38 b. (only adduces examples). Caramuel, *Rat. et Realis Philosophia*, *Logica*, Disp. ix. xvi. Aquinas, *Opusc.* 47. (Camerarius, *Disp. Phil.* P. i. qu. 13, p. 117.) Alstedius, *Encyclopædia*, p. 437. Gassendi, *Opera*, ii. p 413; i. p. 107. Camerarius, *Disp. Phil.* P. i. qu. 13, p. 117. Leibnitz, *Opera* ii. Pars. i. p. 356, *Dissert. de Arte Combinatoria* (1666), ed. Dutens, who refers to Ramus, Gassendi, Alcinous, etc. Cf. *Nouveaux Essais*, L. iv. § 8, p. 454, ed. Raspe; and Locke's *Essay*, *ibid.* Buffier, *Logique*, § 68. Cæsarius, *Dialectica*, Tract. v. *De Syll. Cat.* p 198 (first ed. 1632). J. C. E. *Nova Detecta Veritas*, etc., see Reusch, *Systema Logicum*, § 547, p. 626. Chauvin, *Lexicon Philosophicum*, *v. Figura* Hobbes. *Computatio*, c. iv., prefixes the minor (see Hallam, *Lit. of Europe*, vol. iii. c. 3, p. 309, ed. 1839). Lambert, *Neues Organon*, i. 136, § 225. Bachmann, *Logik*, § 133, pp. 202, 226. Hollmann, *Logica*, § 454. Esser, *Logik*, § 107, p. 210. Krug, *Logik*, § 114, p. 408. Beneke, *System der Logik*, c. v. p. 210 *et seq.* Stapulensis, in Sergeant's *Method to Science*, p. 127. Facciolati (though he errs himself), *Rudimenta Logicæ*, p. 86, P. iii. c. 3, note 4, where Boethius, Sextus Empiricus, Alcinous, etc. Ch Mayne, *Essay on Natural Notions*, p. 122 *et seq.* Lamy, *Acta Erud.*, 1708, p 67.

Who have erred in this subject, — making our order of enunciation the natural and usual. Vives, *Censura Veri. Opera*, t. i. p.

## II. — FIGURE. — UNFIGURED AND FIGURED SYLLOGISM.

### (1853) (a) *CONTRAST AND COMPARISON OF THE VARIOUS KINDS OF FORMAL SYLLOGISM — DIFFERENCE OF FIGURE ACCIDENTAL.*

A.) *Unfigured Syllogism* — One form of syllogism: for here there is abolished, 1°, The difference of Breadth and Depth, for the terms are both Subject or both Predicate, and may be either indifferently; 2°, All order of the terms, for these may be enounced from first or second indifferently; 3°, All difference of major or minor term of proposition, all duplicity of syllogism; 4°, All difference of direct and indirect conclusion.

B.) *Figured Syllogism* — Two forms of syllogism by different orders of terms:

*First Figure.* — Here the two forms of syllogism are possible, each with its major and minor terms, each with its direct or immediate, its indirect or mediate, conclusion. These two various forms of syllogism are essentially one and the same, differing only accidentally in the order of enouncement, inasmuch as they severally depart from one or from the other of the counter, but correlative, quantities of Depth and Breadth, as from the containing whole. But, in fact, we may enounce each order of syllogism [in] either quantity, the one is the more natural. . . . . .

*Second and Third Figures.* — In each of these figures there are possible the two varieties of syllogism; but not, as in the first figure, are these different forms variable by a counter quantity, and with a determinate major and minor term: for in each the extremes and the middle term (there opposed) are necessarily in the same quantity, being either always Subject or always Predicate in the jugation. They differ only as the one extreme, or the other (what is indifferent), is arbitrarily made the Subject or Predicate in the conclusion. Indirect or Mediate conclusions in these figures are impossible; for the indirect or mediate conclusion of the one syllogism is in fact the direct conclusion of the other.

Thus difference of Figure accidental.

If rule true, it will follow that it is of no consequence whether —

1°, The middle one or any other of the three terms be, in any proposition, subject or predicate, if only either. Hence difference of Figure of no account in varying the syllogism. Thus (retaining the subordination of terms), convert major proposition in Extension of first Figure, and you have second Figure;

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606. J. G. Vossius, *De Nat. Art. Liberal.*, *Logica*, c. viii § 9. J. A. Fabricius, *Ad. Sext. Emp.* 103. Facciolati, *Rudimenta Logicæ*, p. 86. Waitz, *In Org. Comm.*, pp. 380, 386.

That Reasoning in Comprehensive Quantity most natural. Wolf, *Phil. Rat.* § 399, p. 327. Reusch, *Systema Logicum*, § 517. Schulze, *Logik*, § 77 of old (1817), § 72 of last (1831) edition, holds that *dictum de omni*, etc., evolved out of *nota notæ*, for mere subordination syllogisms. Hanschius, in *Acta Erud.* 1728, p. 170. Lamy (B.) in *Acta Erud.* 1708, p. 67. Oldfield, *Essay on Reason*, p. 246. Valla, *Dialectica*, L. iii. c. 45. Hoffbauer, *Analytik der Urtheile und Schlusse*, § 152, p. 198. Mayne's *Rational Notions*, p. 123 *et seq.* Mariotte, *Logique*, Part ii., disc. iii. p. 161. Paris, 1678. Chladenus, *Phil. Def.* p. 18 (in Wolf, *Phil. Rat.* § 551). Castillon, *Mem. de Berlin*, 1802. Hallam, *Lit. of Europe*, vol. iii. p. 309. Thomson (W.), *Outlines of the Laws of Thought*, p. 39. In reference to the above, the mathematicians usually begin with what is commonly called the Minor Premise (as A = B, B = C, *therefore* A = C); and frequently they state the Conclusion first (as A = B *for* A = M, *and* M = B), or, etc., see Wolf, *Phil. Rat.* § 551, and Twesten, *Logik*, § 117, p. 105; and Lambert, *Neues Org.* i. § 225.]

convert minor proposition, and you have third Figure; convert both premises and you have fourth Figure.

2°, Whether one of the extremes, one or other of the premises, stand first or second, be, in fact, major or minor term of a proposition; all that is required is, that the terms and their quantities should remain the same, and that they should always bear to each other a relation of subject and predicate. Thus, if [in] any of the Figures the major and minor terms and propositions interchange relation of subordination; when, in the first Figure, you convert and transpose; and when [in] the other three Figures (fourth ?), you simply transpose the premises.

Indifferent (in first Figure) which premise precedes or follows. For of two one not before the other in nature. But not indifferent in either whole, which term should be subject and predicate of conclusion.[1]

### (b) DOUBLE CONCLUSION IN SECOND AND THIRD FIGURES.

My doctrine is as follows:

In the *Unfigured Syllogism* there is no contrast of terms, the notions compared not being to each other subject and predicate; consequently the conclusion is here necessarily one and only one.

In the *Figured Syllogism* we must discriminate the Figures.

In the First Figure, where the middle term is subject of the one extreme and predicate of the other, there is of course a determinate major extreme and premise, and a determinate minor extreme and premise; consequently, also, one proximate or direct, and one remote or indirect, conclusion, — the latter by a conversion of the former.

In the Second and Third figures all this is reversed. In these there is no major and minor extreme and premise, both extremes being either subjects or predicates of the middle; consequently, in the inference, as either extreme may be indifferently subject or predicate of the other, there are two indifferent conclusions, that is, conclusions neither of which is more direct or indirect than the other.

This doctrine is opposed to that of Aristotle and the logicians, who recognize in the Second and Third Figures a major and minor extreme and premise, with one determinate conclusion.

The whole question with regard to the duplicity or simplicity of the conclusion in the latter figures depends upon the distinction in them of a major and a minor term; and it must be peremptorily decided in opposition to the universal doctrine, unless it can be shown that, in these figures, this distinction actually subsists. This was felt by the logicians; accordingly they applied themselves with zeal to establish this distinction. But it would appear, from the very multiplicity of their opinions, that none proved satisfactory: and this general presumption is shown to be correct by the examination of these opinions in detail, — an examination which evinces that of these opinions there is no one which ought to satisfy an inquiring mind.

In all, there are five or six different grounds on which it has been attempted to establish the discrimination of a major and minor term in the Second and Third Figures. All are mutually subversive; each is incompetent. Each following the first is in fact a virtual acknowledgment that the reason on which Aristotle proceeded in this establishment is at once ambiguous and insufficient. I shall enumerate these opinions as nearly as possible in chronological order.

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[1] Compare *Discussions*, p. 653. — Ed.

1. *That the major is the extreme which lies in the Second Figure nearer to, in the Third Figure farther from, the middle.* This is Aristotle's definition (*An. Pr.*, L. i. cc. 5. 6). At best it is ambiguous, and has, accordingly, been taken in different senses by following logicians; and in treating of them it will be seen that in none, except an arbitrary sense, can the one extreme, in these figures, be considered to lie nearer to the middle term than the other. I exclude the supposition that Aristotle spoke in reference to some scheme of mechanical notation.

2. *That the major term in the antecedent is that which is predicate in the conclusion.* This doctrine dates from a remote antiquity. It is rejected by Alexander; but, adopted by Ammonius and Philoponus (f. 17 b, 18 a, ed. Trinc.), has been generally recognized by subsequent logicians. Its recognition is now almost universal. Yet, critically considered, it explains nothing. Educing the law out of the fact, and not deducing the fact from the law, it does not even attempt to show why one being, either extreme may not be, predicate of the conclusion. It is merely an empirical, — merely an arbitrary, assertion. The Aphrodisian, after refuting the doctrine, when the terms are indefinite (preindesignate), justly says: "Nor is the case different when the terms are definite [predesignate]. For the conclusion shows as predicate the term given as major in the premises; so that the conclusion is not itself demonstrative of the major: on the contrary, the being taken in the premises as major, is the cause why a term is also taken as predicate in the conclusion." — (*An. Pr.* f. 24 a, ed. Ald.)

3. *That the proximity of an extreme to the middle term, in Logic, is to be decided by the relative proximity in nature to the middle notion of the notions compared.* This, which is the interpretation of Aristotle by Herminus, is one of the oldest upon record, being detailed and refuted at great length by the Aphrodisian (f. 23 b. 24 a). To determine the natural proximity required is often difficult in affirmative, and always impossible in negative, syllogism; and, besides the objections of Alexander, it is wholly material and extralogical. It is needless to dwell on this opinion, which, obscure in itself, seems altogether unknown to our modern logicians.

4. *That the major term in the Syllogism is the predicate of the problem or question.* This is the doctrine maintained by Alexander (f. 24 b): but it is doubtful whether at first or second hand. It has been adopted by Averroes, Zabarella, and sundry of the acuter logicians in modern times. It is incompetent, however, to establish the discrimination. Material, it presupposes an intention of the reasoner: does not appear *ex facie syllogismi*; and, at best, only shows which of two possible quæsita — which of two possible conclusions — has been actually carried out. For it assumes, that of the two extremes either might have been major in the antecedent, and predicate in the conclusion. If Alexander had applied the same subtlety in canvassing his own

opinion which he did in criticizing those of others, he would not have given the authority of his name to so untenable doctrine.

5. *That the major extreme is that contained in the major premise, and the major premise that in the order of enouncement first.* This doctrine seems indicated by Scotus (*An. Pr.*, L. i. qu. xxiv. §§ 5, 6): and is held explicitly by certain of his followers. This also is wholly incompetent. For the order of the premises, as the subtle doctor himself observes (*Ib.*, qu. xxiii. § 6), is altogether indifferent to the validity of the consequence; and if this external accident be admitted, we should have Greek majors and minors turned. presto, into Latin minors and majors.

6. *That the major extreme is that contained in the major premise, and the major premise that itself most general.* All opposite practice originates in abuse. This opinion, which coincides with that of Herminus (No. 3). in making the logical relation of terms dependent on the natural relation of notions, I find advanced in 1614, in the *Disputationes* of an ingenious and independent philosopher, the Spanish Jesuit Petrus Hurtado de Mendoza (*Disp. Log. et Met.*, L. Disp. x. §§ 50–55). It is, however, too singular, and manifestly too untenable, to require refutation. As material, it is illogical; as formal, if allowed, it would at best serve only for the discrimination of certain moods: but it cannot be allowed, for it would only subvert the old without being adequate to the establishment of aught new. It shows, however, how unsatisfactory were the previous theories, when such a doctrine could be proposed, by so acute a reasoner, in substitution. This opinion has remained unnoticed by posterior logicians.

The dominant result from this historical enumeration is, that, in the Second and Third Figures, there is no major or minor term, therefore no major or minor premise, therefore two indifferent conclusions.

This important truth, however natural and even manifest it may seem when fully developed, has but few and obscure vaticinations of its recognition during the progress of the science. Three only have I met with.

The first I find in the Aphrodisian (f. 24 b); for his expressions might seem to indicate that the opinion of there being no major and minor term in the second figure (nor, by analogy, in the third), was a doctrine actually held by some early Greek logicians. It would be curious to know if these were the "ancients," assailed by Ammonius, for maintaining an overt quantification of the predicate. The words of Alexander are: — "Nor, however, can it be said that in the present figure there is no major. For this at least is determinate, that its major must be universal; and, if there be in it any syllogistic combination, that premise is the major which contains the major term" (f. 24 a.). Demurring to this refutation, it is, however, evidence sufficient of the opinion to which it is opposed. This, as it is the oldest, is, indeed, the only authority for any deliberate doctrine on the point.

The second indication dates from the middle of the fifteenth century, and is contained in the *Dialectica* of the celebrated Laurentius Valla (L. iii. c. 8 [51]). Valla abolishes the third figure, and his opinion on the question is limited to his observations on the second. In treating of *Cesare* and *Camestres*, which, after a host of previous logicians, he considers to be a single mood, there is nothing remarkable in his statement: "Neque distinctæ sunt pro-

positio et assumptio, ut altera major sit, altera minor, sed quodammodo pares; ideoque sicut neutra vindicat sibi primum aut secundum locum, ita utraque jus habet in utraque conclusione. Verum istis placuit, ut id quod secundo loco poneretur, vendicaret sibi conclusionem: quod verum esset nisi semper gemina esset conclusio. Sed earum dicamus alteram ad id quod primo loco, alteram ad id quod secundo loco positum est referri." We, therefore, await the development of his doctrine by relation to the other moods, *Festino*, and *Baroco*, which thus auspiciously begins: — "Item contingit in reliquis duobus: qui tamen sunt magis distincti." We are, however, condemned to disappointment. For, by a common error, excusable enough in this impetuous writer, he has confounded singulars (definites) with particulars (indefinites): and thus the examples which he adduces of these moods are, in fact, only examples of *Cesare* and *Camestres*. The same error had also been previously committed (L. iii. c. 4). The whole, therefore, of Valla's doctrine, which is exclusively founded on these examples, must go for nothing; for we cannot presume, on such a ground, that he admits more than the four common moods, identifying, indeed, the two first, by admitting in them of a double conclusion. We cannot, certainly, infer that he ever thought of recognizing a particular, an indefinite, predicate in a negative proposition.

The third and last indication which I can adduce is that from the *Method to Science* of John Sergeant, who has, in this, as in his other books (too successfully), concealed his name under the initials "J. S." He was a Catholic priest, and, from 1665, an active religious controversialist; whilst, as a philosopher, in his *Idea Philosophiæ Cartesianæ*, a criticism of Descartes, in his *Solid Philosophy*, a criticism of Locke,[1] in his *Metaphysics*, and in the present work, he manifests remarkable eloquence, ingenuity, and independence, mingled, no doubt, with many untenable, not to say ridiculous, paradoxes. His works, however, contain genius more than enough to have saved them, in any other country, from the total oblivion into which they have fallen in this, — where, indeed, they probably never were appreciated. His *Method to Science* (a treatise on Logic) was published in 1696, with a "Preface, dedicatory to the learned students of both our Universities," extending to sixty-two pages. But, alas! neither this nor any other of his philosophical books is to be found in the Bodleian.

In the third book of his *Method*, which treats of Discourse, after speaking of the first, or, as he calls it, "only right figure of a syllogism," we have the following observations on the second and third: — "§ 14. Wherefore the other two figures [he does not recognize the fourth] are unnatural and monstrous. For, since nature has shown us, that what conjoins two notions ought to be placed in the middle between them; it is *against nature and reason* to place it either *above* them *both*, as is done in that they call the *second figure*, or *under* them *both*, as is done in that figure they call the *third*.

"§ 15. Hence no determinate conclusion can follow, in either of the last figures, from the disposal of the parts in the syllogisms. For since, as appears (§ 13), the extreme which is predicated of the middle term in the *major*, has thence a title to be the predicate in the *conclusion*, because it is above the middle term, which is the *predicate*, or *above* the *other* extreme in the *minor*, it follows, that if the middle term be *twice above* or *twice below* the other two terms in the premises, that reason ceases; and so it is left indifferent which of the other terms is to be subject or predicate in the conclusion; and the indeterminate conclusion follows, not from the artificial *form* of the syllogism, but merely from the *material* identity of all the three terms; or from this, that their notions are found in the same *Ens*. Wherefore, from these premises [in the second figure],

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[1] Sergeant is an intelligent antagonist of both these philosophers, and I have elsewhere had occasion to quote him as the first and one of the ablest critics of the *Essay on Human Understanding*. In certain views he anticipates Kant; and Pope has evidently taken from his brother Catholic the hint of some of his most celebrated thoughts.

*Some laudable thing is* [*all*] *virtue*,
[*All*] *courtesy is a virtue*;

or, from these [in the third],

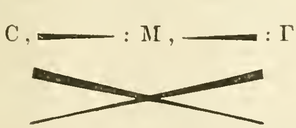
[*All*] *virtue is* [*some*] *laudable*,
*Some virtue is* [*all*] *courtesy*;

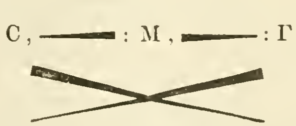
the conclusion might either be,

*Therefore*, [*all*] *courtesy is* [*some*] *laudable*,
Or, *Some laudable thing is* [*all*] *courtesy*.

So that, to argue on that fashion, or to make use of these awkward figures, is not to know certainly the end or conclusion we aim at, but to shoot our bolt at no determinate mark, since no determinate conclusion can in that case follow." (P. 232.)

Extremes, it is said, meet. Sergeant would abolish the second and third figures, as petitory and unnatural, as merely material corruptions of the one formal first. I, on the contrary, regard all the figures as equally necessary, natural, and formal. But we agree in this: both hold that, in the second and third figures, there is a twofold and indifferent conclusion; howbeit, the one makes this a monstrosity of the syllogistic matter, the other, a beauty of the syllogistic form. Therefore, though I view Sergeant as wrong in his premises, and "shooting his bolt at no determinate mark," I must needs allow that he has, by chance, hit the bull's eye. I have inserted, within square brackets, the quantifications required to restore and show out the formality of his examples. On my scheme of notation, they stand as follows:





## III. — Historical Notices Regarding Figure of Syllogism.

### (a) ARISTOTLE.

Aristotle; Figures and Terms of Syllogism, *Prior Analytics*, B. I. ch. iv.

First Figure, ch. iv. — § 2. "When three terms [or notions] hold this mutual relation, — that the last is in the whole middle, whilst the middle is or is not in the whole first, — of these extremes there results of necessity a perfect syllogism.[1]

§ 3. "By *middle* term [B (B)] I mean that which itself is in another and another in it; and which in position also stands intermediate. I call *extreme* both that which is itself in another [the minor], and that in which another is [the major]. For if A be predicated of all B, and B of all C, A will necessarily be predicated of all C.

§ 10. "I call that the *major* extreme [A (A)] in which the middle is; the *minor* [Γ (C)] that which lies under the middle."

Second Figure, ch. v. — § 1. "When the same [predicate notion] inheres in all of the one and in none of the other, or in all or in none of both [the subject notions], — this I denominate the *Second Figure*.

§ 2. "The *middle* [M (M)] in this figure I call that which is predicated of both [notions]; the *extremes*, the [notions] of which the middle is said. The *major* extreme [N (N)] is that towards the middle; the *minor* [Ξ (O)], that from the middle more remote.

§ 3. "The middle is placed out [from between] the extremes, the first in position" —

[So, M ——— M
N ——— N
Ξ ——— O]

Third Figure, ch. vi. — § 1. "When in the same [subject notion] one [predicate notion] inheres in all, another in none of it, or when both inhere in all or in none of it, such *figure* I call the *Third*.

§ 2. "In this [figure] I name the *middle*, that of which both [the other terms] are predicated; the *extremes*, the predicates themselves. The *major* extreme [Π (P)] is that farther from, the *minor* [P (Q)] that nearer to, the middle.

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[1] Ch. iv. § 2 — This definition of the First Figure (founded on the rules De Omni and de Nullo) applies only to the universal moods, but, of these, only to those legitimate and useful, — Barbara and Celarent. It, therefore, seems inadequate, but not superfluous.

Aristotle uses the phrase "to be in *all* or in the *whole*," both with reference to *extension*, — for the lower notion B, as contained under the all or whole of the higher notion A; and with reference to comprehension, — for the higher notion A as contained in the all or whole of the lower notion B. In the former sense, which with Aristotle is the more usual, and, in fact, the only one contemplated by the logicians, there is also to be observed a distinction between the inhesion and the predication of the attribute.

§ 3. "The *middle* [Σ (R)] is placed out [from between] the extremes, the last in position,"

$$\left[\text{As, }\begin{array}{lcl} \Pi & \text{———} & P \\ \mathrm{P} & \text{———} & Q \\ \Sigma & \text{———} & R \end{array}\right]$$

* * * * * * *

Aristotle, *Prior Analytics*, B. i. c. 23, § 7.

General Theory of Figure. — "If, then, it be necessary [in reasoning] to take some [term] common [or intermediate] to both [extreme terms]; this is possible in three ways. For we predicate either [the extreme] A of [the middle] C, and [the middle] C of [the extreme] B; or [the middle] C of both [extremes]; or both [extremes] of [the middle] C. These are the [three] Figures of which we have spoken; and it is manifest, that through one or other of the Figures every syllogism must be realized."[1]

### *(b) and (c) – ALEXANDER AND HERMINUS.*

Alexander, *In An. Pr.*, f. 23 b.

Second Figure, c. v. Aristotle. — "'The middle extreme is that which lies towards the middle.'

§ 2. "But it is a question, whether in the Second Figure there be by nature any major and minor extreme, and if there be, by what criterion it may be known. For if we can indifferently connect with the middle *term* whichsoever *extreme* we choose, this we may always call the *major*. And as negative conclusions only are drawn in this figure, universal negatives being also mutually convertible, it follows, that in universal negatives the one term has no better title to be styled major than the other, seeing that the major term is what is predicated, whilst both are here indifferently predicable of each other. In universal affirmatives, indeed, the predicate is major, because it has a wider extent; and for this reason, such propositions are not [simply] convertible; so that here there is by nature a major term which is not to be found in universal negatives.

"Herminus is of opinion that, in the Second Figure,

[1°.] "If both the extremes, of which the middle is predicated, be homogeneous [or of the same genus], the major term is that most proximate to the genus common to the two. For example: If the extremes be *bird* and *man*; *bird* lying nearer to the common genus [*animal*] than *man*, as in its first division, *bird* is thus the major extreme; and, in general, of homogeneous terms, that holding such a relation to the common genus is the major.

[2°.] "But if the terms be equally distant from the common genus, as *horse* and *man*, we ought to regard the middle predicated of them, and consider of which [term] it is predicated through [that term] itself, and of which through some other predicate; and compare that through which it is predicated of another with that through which it is predicated of [the term] itself. And if that through which [the middle] is predicated of another (viz. the one extreme) be nearer [than the other extreme] to the common genus, that [extreme] of which [for τούτων οὐ, I read τοῦτον οὗ] the middle is [mediately] predicated, from its closer propinquity to the common genus, rightly obtains the title of *major*. For example: If the extremes be *horse* and *man*, *rational* being predicated of them, — negatively of *horse*, affirmatively of *man;* seeing that *rational* is not of itself denied of *horse*, but because *horse* is *irrational*, whereas *rational* is of itself affirmed of *man*, *horse* is nearer than *man* to their common genus *animal; horse* will, therefore, be the major extreme, though *man* be no further removed than *horse* from its proper genus. And this, because that through which the predicate [*i. e.* the middle] is predicated of this last, as being *irrational*, is greater; for *rational* is not denied of *horse qua horse*, whilst it is affirmed of *man qua man*.

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[1] Aristotle here varies the notation by letters of the three syllogistic terms, making C (Γ) stand for the middle term, A and B for the two extremes. This he did, perhaps, to prevent it being supposed (what his previous notation might appear to indicate) that the middle term was a notion in the First Figure, necessarily intermediate between the two extremes, in the Second superior, in the Third inferior, to them.

[3°.] "But if the extremes be not homogeneous, but under different genera, that is to be considered the major term, which of the two holds the nearer of its own genus. For instance: If aught be predicated of *color* and *man*, *color* is the major extreme; for *color* stands closer to *quality* than *man* to *substance:* as *man* is an individual [or most special] species, but not *color*.

[4°.] "Finally, if each be equally remote from its proper genus, we must consider the middle, and inquire of which term it is predicated through [that term] itself, and of which through something else; and if that, through which the middle is predicated of another [*i. e.*, one extreme], be nearer to its proper genus, and if through that the middle be actually predicated of this term, this term is to be deemed the major. For example: If the terms be *white* and *man*, the one being an individual species in *quality*, the other in *substance;* and if *rational* be affirmatively predicated of *man*, negatively of *white;* the affirmation is made in regard to *man* as *man*, whereas the negation is made of *white*, not as *white*, but as *inanimate*. But since *inanimate*, through which *rational* is denied of *white*, is more common, more universal, and more proximate to *substance inanimate* than *man* to [*substance*] *animate*, on that account, *white* is the major term in preference to *man*." [So far Herminus.]

"But to reason thus, and to endeavor to demonstrate a major term by nature, in the Second Figure, is a speculation which may be curious, but is not true. [I read πρὸς τῷ.]

[1°.] "For, in the first place, if we consider the given terms, not in themselves, but in relation to others, in which the predicated term does not inhere; the major term will be always found in the negative proposition. For, in this case, the major is always equal to the middle term; since, whether it be thus or thus taken from the commencement, or be so made by him who denies it, the negative major will still stand in this relation to the middle term. For the middle does not inhere, where it is not supposed to inhere. Wherefore, its repugnant opposite inheres in the subject, but the repugnant opposite of the middle is equal to the middle. And this, either through the middle itself, or through another notion of wider extent; as when *rational* is denied of something through *inanimate*. For there is here an equalization through *irrational*, through which *rational* is negatively predicated of *horse*. For either the middle is equal to this of which it is denied, or [I read ἢ for δ] it is less; as when through *inanimate*, *rational* is denied of aught. For *inanimate* is equal to *animate*, under which is *rational*, a notion greater than that other of which it is affirmed. For since the affirmative predicate is greater than its subject, of which the middle is denied or not affirmed; and since the reason why the middle is denied is equal to or greater than the middle itself, which middle, again, in an affirmative proposition, is greater than its subject; — on these accounts a negative proposition is always greater than an affirmative. Nevertheless, Aristotle himself says that a negation is to be placed in the minor [proposition]; for the second syllogism in this figure [Camestres] has as its minor premise a universal negative.

[2°.] "Further, why in the case of negatives alone should explanation or inquiry be competent, in regard to the reason of the negative predication, seeing that in the case of affirmatives the reason is equally an object of inquiry? For *rational* is predicated of *man*, of itself, indeed, but not primarily, that is, not inasmuch as he is *man*, but inasmuch as he is *rational*; so that if *rational* [be denied] of *horse* through *irrational*, still these are both branches of the same division. By this method, assuredly, no major can be ever found. Wherefore, we ought not, in this way, to attempt a discrimination of the major of affirmative syllogisms in the Second Figure. For in this figure affirmation and negation are equally compatible with the major term; so that whatsoever term has by the forementioned method been found major, the same, taken either as major or minor, will effectuate a syllogistic jugation; which being competent, there is no longer any major [or minor] in this figure. For the problem is to find not a major term absolutely, but one of this figure." [So much touching Herminus.]

[3°.] "Nor, on the other hand, as is thought by some, is that unconditionally to be called the major term which stands predicate in the conclusion. For neither is this manifest; if left indefinite [preindesignate], the same term will hold a different relation, though a conversion of the universal negative; so that what is now the major, may be anon the minor. We may, in fact, be said to constitute the same term both major and minor. Naturally there is in negative propositions no major notion, nor, from the conclusion, ought we to make out the major at all. Nor is the case different when the term is defined [predesignate]. For the conclusion shows, as predicate, the term given as major in the premises; so that the conclusion is not itself demonstrative of the major; on the contrary, the being taken in the premises as major is the cause why a term is also taken as predicate in the conclusion.

"Nor, however, can it be said that in this figure there is no major. For this at least is determinate, — that its major must be universal; and, if there be [in it] any syllogistic combination, that premise is the major which contains the major term.

[4°.] "But, in the Second Figure, which of the terms is to be deemed the major? That is to be deemed the major, and to be placed first, which in the problem [question or quæsitum] we intend to demonstrate, and which we regard as predicate. For every one who reasons, first of all determines with himself what it is he would prove; and to this end he applies his stock of suitable propositions; for no one stumbles by chance on a conclusion. The notion, therefore, proposed as predicate in the problem to be proved, is to be constituted the major term; for although the proposition be converted, and the notion thereby become the subject, still, in what we proposed to prove, it [actually] was, and, therefore [virtually], remains, the predicate. Hence, even if there be drawn another conclusion, we convert it; so that, to us who prove and syllogize and order terms, that always stands as the major. For major and minor are not, in negative syllogisms, regulated by their own nature, but by the intention [of the reasoner] to conclude. Thus it is manifest, that what is the predicate in the problem, is also the predicate in the conclusion."

Alexander on *Prior Analytics*, L. i. c. vi. f. 30 a. ed. Ald.

(Third Figure.) . . . This is the Third Figure, and holds the last place because nothing universal is inferred in it, and because sophistical syllogisms chiefly affect this figure with their indefinite and particular conclusions. But the sophistical are the last of all syllogisms. . . . Add to this, that while both the Second and Third Figures take their origin from the First of the two, the Third is engendered of the inferior premise. For the minor, *qua* minor, is the inferior premise, and holds reasonably a secondary place [the conversion of the minor proposition of the first figure giving the second figure].

F. 30 b. (Darapti). "The first syzygy in this figure is of two universal affirmatives [Darapti]. But it may be asked — Why, whilst in the second figure there are two syllogistic conjugations, having one of the premises a universal affirmative, the other a universal negative (from having, now their major, now their minor, as a universal negative proposition converted), — why, in the third figure, there is not, in like manner, two syllogistic combinations of two universal affirmatives, since of these either the major or the minor proposition is convertible? Is it that in the second figure, from the propositions being of diverse form [quality], the commutation of a universal negative into something else by conversion is necessary, this being now the major, now the minor, and it not being in our power to convert which we will? In the third figure, on the other hand, there being two universal affirmatives, the position [relation] of the propositions (for they are similar in character and position) is not the cause of one being now converted, now another; the cause lying in us, not the jugation. Wherefore, the one or other being similarly convertible, inasmuch as the position [relation] of the two propositions is the same; the one which affords the more important probation is selected, and hereby is determined the syllogistic jugation. Moreover, the differences of syllogism [moods] in each figure are effected by the differences among their jugations, not by those among their probations. Thus that the combination of propositions is syllogistic [or valid], is proved by conversion and *reductio ad impossibile*, also by exposition. But from this circumstance there does not emerge a plurality of syllogisms [moods]. For the different probations [are not valid from such plurality, but] from the unity of the jugation from which they are inferred, so that one jugation of two universal affirmatives may constitute, in the third figure, a single syllogism [mood], howbeit the probations are different; inasmuch as now the one, now the other, of the propositions can be converted."

### (d) — PHILOPONUS.

Philoponus (or rather Ammonius) on Aristotle, *An. Pr.*, i. 4, § i. f. 17 a, ed. Trincavelli, 1536.

"The Predicate is always better than the subject, because the predicate is, for the most part, more extensive (ἐπὶ πλέον) than the subject, and because the subject is analogous to the matter, the predicate to the form; for the matter is the subject of the forms. But when the middle term is predicated of the two extremes, or is the subject of both, in this case it is not properly intermediate. But, howbeit, though in position external to the middle, it is still preferable to be the predicate than to be the subject. On this ground, that is called the first figure, the middle term of which preserves its legitimate order, being subject of the one extreme, and predicate of the other. The second figure is that in which the middle is predicated of both extremes, and in which it occupies the better position of those remaining. Finally, the third figure is that in which the middle term is subjected to the two extremes; here obtaining only the *lowest* position. Wherefore, in the first figure the middle term is delineated on a level with the extremes; whereas in the second it is placed *above*, and in the third *below*, them."[1]

Philoponus (or rather Ammonius) on Aristotle, *An. Pr.*, f. 17 a, ed. Trincavelli, 1536.

Syllogistic Figures in general. — "We must premise what is the Major Proposition of the Syllogism, and what the Minor. But to understand this, we must previously be aware what are the Major and Minor Terms. And it is possible to define these, both, in common, as applicable to all the three figures, and, in special, with reference to the first alone. In the latter relation, that is, regarding specially the first figure, *the Major Term is that which constitutes the Predicate, the Minor that which constitutes the Subject, of the Middle*, so far as limited to the first figure. But since in neither of the other figures do the extremes reciprocally stand in any definite (?) relation to the middle term, it is manifest that this determination is inapplicable to them. We must, therefore, employ a rule common to all the three figures; to wit, that the *major term is that predicated, the minor that subjected, in the conclusion.* Thus, *the Major Proposition is the one containing the Major Term: the Minor Proposition the one containing the Minor Term.* Examples: Of the First Figure, — *Man* [*is*] *animal; animal, substance: therefore, man, substance.* . . . . . Of the Second, — *Animal* [is predicated] *of all man; animal of no stone; man, there-*

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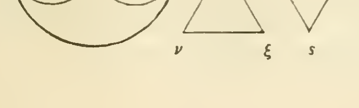
[1] Ammonius, or Philoponus, here manifestly refers to the diagrams representing the three figures, and accommodated to Aristotle's three sets of letters, noting the three terms in each of these; thus: Whether these diagrams ascend higher than Ammonius does not appear; for they are probably not the constructions referred to by Aristotle; and none are given by the Aphrodisian in his original text, though liberally supplied by his Latin translator. The diagrams of Ammonius were long generally employed. By Neomagus, 1533 (*In Trapezuntii Dialect.*, f. 35), they are most erroneously referred to Faber Stapulensis. [See further. ***Discussions***, p. 670. — ED.]



*fore, of no stone.* . . . . . Of the Third, — *Some stone is white: all stone is inanimate: consequently, some white is inanimate.*"

First Figure. — F. 19 b, 59; Aristotle, *l. c.* § 3. "'But I call that the middle term which itself is in another, and another in it; and which in position lies intermediate.'

"This definition of the middle term is not common to the three figures, but limited to the middle of the first figure only. For, etc. . . . . . But, if there be a certain difference in species between the middle terms of the three figures, they have likewise something in common; to wit, that the middle term is found twice in the premises, throughout the three figures; which also in position is middle. For Aristotle wishes in the Diagraph (ἐν αὐτῇ τῇ καταγραφῇ) to preserve the order of intermediacy, so that, placing the three terms in a *straight line*, we assign the middle place to the middle term. [?]

Aristotle, *l. c.* § 4. "'But [I call] the *extremes* both that which is in another, and that in which another is. For if A be predicated of all B, and B of all C, it is necessary that A should also be predicated of all C. We have previously said what we mean by the expression [predicated] *of all.*'"

"It may seem, perhaps, that this is a [perfect] definition of the extremes and of the middle term. But it is not; for it behooves us to sub-understand, in addition, the word *only;* and thus the definition will rightly run, — But [I call] the extremes, both that which is in another [minor], and that in which another is [major]. For if A be predicated of all B, and B of all C, it is necessary that A be predicated of all C.

"This the first syllogistic mood is of two affirmative universals, collecting an affirmative conclusion. For if B inheres in all C, C is, consequently, a part of B. But B is a part of A: A therefore, also, inheres in all C, C being a part of B. The reasoning will be plainer in material examples — as *substance* [is predicated] *of all animal; animal of all man;* and there is inferred *substance of all man:* and conversely, *all man* [is] *animal: all animal substance; therefore, all man substance.*

"But it is manifest how, in this figure, the term of the first mood [Barbara] ought to be taken. The first is the most general, and the second the subaltern, genus; whilst the third is a species more special than the middle. The conclusion ought always to be drawn. Thus, if, proceeding synthetically, we commence by the major term [and proposition], *substance* begins; wherefore it also leads the way in the conclusion. [There is predicated] *substance of all animal* (here *substance* commences): *animal of all man;* whilst the conclusion again commences with *substance,* — *substance of all man.* But if we start from the minor term [and proposition], as from *man,* with this also the conclusion will commence; *all man* [is] *animal, all animal substance; all man substance.*

"Aristotle takes the terms A, B, C; and, from the relation of the letters, he manifests to us the order of the first figure. The major term he calls A, because A stands first in order; the minor term C; and the middle term B; as B, in its order, follows A, and precedes C.

"It is plain that the terms may possibly be coadequate [and therefore reciprocating]; as *receptive of science — risible — man;* for *all man is risible; all risible is receptive of science; therefore, all man is receptive of science.*"

F. 23 b, Aristotle, ch. 5, § 2, Second Figure. "'The major extreme is that which lies nearer to the middle; the minor, that which lies farther from the middle.'

"In place of more akin and more proximate to the middle; not in position, but in dignity. For since, of the terms, the middle is twice predicated, while, in the conclusion, the major is once predicated, but the minor not even once predicated; [consequently] that which is once predicated will be the more proximate to that which is twice predicated, that is, to the middle, than that which is not even once predicated. Wherefore, we shall hear him [Aristotle], in the Third Figure, calling the minor the term more proximate to the middle on account of their affinity, for they are both subjects, while he calls the major term the more remote. Perhaps, also, he wishes that in the diagraph (τῇ καταγραφῇ) the major term should be placed closer to the middle, and the minor farther off. But the major extreme in this figure, the two premises being universal, exists not by nature but by position, for the first of the extremes which you meet with as a subject in the second figure, — this is the minor extreme, the other is the major. So in the example — *All man an animal; no plant animal: therefore, no man plant.* In like manner, if we take the commencement from *plant*, this becomes the minor term, and *man* the major; as, *no plant animal; all man animal: no plant, therefore, man.* Consequently the major and minor terms exist in these examples only by position, not by nature. If, indeed, one or other of the propositions be particular, the major and the minor terms are then determined; for we hold that in this figure the universal is the major."

Aristotle. — § 3. "'The middle is placed external to [not between] the extremes, and first in position.'

"The middle term passes out of what is properly the middle position; it is also placed out of or external to the extremes; but either above these or below. But if it be placed above, so as to be predicated of both, it is called first in position; if below, so as to be subjected, it is called second. Wherefore, here, as predicate of both premises, he styles the middle term the first; for if it be placed above, it is first in position, and in being apart from the extremes, it is placed without them."

Aristotle, ch. 6, § 2. Third Figure, f. 27 b. "'The major extreme is that more remote from, the minor is that more proximate to, the middle.'

"The major term in this figure is twice predicated of the middle, and in the conclusion; but the minor once only, and that of the middle, for it is subjected to the major in the conclusion; the middle alone is subjected, never predicated. When he, therefore, says that the major term is more remote from the middle, he means the term always predicate is in affinity more remote from that which is never predicate, but always subject. And that which is never subject is the major and more proximate term; that again, which is now subject, now predicate, is the minor."

### (e) MARTIANUS CAPELLA.[1]

Martianus Capella, *De Septem Artibus Liberalibus*, L. iv. *De Dialectica*, in capite. *Quid sit Predicativus Syllogismus*, p. 127, ed. Grotii; p. 83, ed. Basil 1532.

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[1] Flourished A. C. 457, Passow; 474, Tennemann.

"Hujus generis tres formæ [figuræ] sunt.

"Prima est, in qua declarativa [prædicatum] particula superioris sumpti, sequentis efficitur subjectiva [subjectum]; aut subjectiva superioris, declarativa sequentis. Declarativa superioris fit subjectiva sequentis, ut *Omnis voluptas bonum est: omne bonum utile est; omnis igitur voluptas utilis est.* Subjectiva superioris fit declarativa sequentis, si hoc modo velis convertere: *Omne bonum utile est; omnis voluptas bonum est; omnis igitur voluptas utilis est.*"

In First Form or Figure, notices the four direct and five indirect moods, — *reflexion*; and, in the second and third, the usual number of moods.[1]

In Second Figure — "Hic reflexione si utaris, alius modus non efficitur, quoniam de utrisque subjectivis fit illatio." He seems to hold that two direct conclusions are competent in Second and Third Figures.

In Second Figure he enounces generally (four times) as thus: — "*Omne justum honestum: nullum turpe honestum; nullum igitur justum turpe;*" but sometimes (once) thus, — "*Nullum igitur turpe justum.*"

In Third Form or Figure generally (six times) thus, as — "*Omne justum honestum: omne justum bonum; quoddam igitur honestum bonum;*" but sometimes (once) as — "*Quoddam igitur bonum honestum.*"

### (f) ISIDORUS.

Isidorus, *Originum*, L. i c. 28. *De Syllogismis Dialecticis. Opera*, p. 20 (1617); in *Gothofred. Auctores*, p. 878.

"Formulæ Categoricorum, id est, Prædicativorum Syllogismorum sunt tres. Primæ formulæ modi sunt novem.

"Primus modus est qui conducit, id est, qui colligit ex universalibus dedicativis dedicativum universale directim: ut, *Omne justum honestum; omne honestum bonum: ergo omne justum bonum.*" All in first figure, with minor first; in second and third figures, varies; uses *per reflexionem et reflexim* indifferently; and through all moods of all figures follows Apuleius. "Has formulas Categoricorum Syllogismorum qui plene nosse desiderat, librum legat qui inscribitur *Perihermenias Apuleii*, et quæ subtilius sunt tractata cognoscet."

### (g) AVERROES.

Averroes, *In Anal. Prior*, L. i. c. v., on First Figure. — "If, therefore, the middle term be so ordered between the two extremes, that it be predicated of the minor and subjected to the major (as, if we say *all* C *is* B, and *all* B *is* A): it is plain that this order of syllogism is natural to us; and it is called by Aristotle the First Figure." And thus are stated all the examples in detail.

C. vi., Figure Second. — "And the proposition whose subject is the subject of the quæsitum is the minor proposition, but that whose subject is the predicate of the quæsitum is the major. Let us then place first in order of enunciation the minor extreme; let the middle term then follow, and the major come last, to the end that thus the major may be distinguished from the minor; for in this figure the terms are not distinguished, unless by relation to the quæsitum." So all the examples.

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[1] Cassiodorus, in First Figure, gives both terms, "vel sic," in Second and Third, though he gives also a "vel sic," they are examples, both in converse, of Capella's general mode of enunciation. See *Dialect.*, *Opera*, pp 538, 556, Genev. 1650, and above, p. 626 (fl 520). Cf Apuleius, *De Syllogismo Categorico*, *Op.*, p. 35. Elmen. (A. C. 160). Isidorus, of Seville (*Gothofr. Auct.*, p. 878), (A. C. 600; died 636)

C. vii., Third Figure. — "That proposition in which lies the subject of the quæsitum is called the minor proposition, since the subject itself is called the *minor term;* that proposition which contains the predicate of the quæsitum is named the *major.* In the example, let the minor term be C, the middle B, and the major A, and their order be that we first enounce the middle, then the minor, and last of all the major." And so the examples.

### (h) MELANCHTHON.

Melanchthon, *Erotemata Dialecticæ*, L. iii. p. 175.

"Demonstration why there are necessarily three [and only three] Figures.

"Every argumentation which admits the syllogistic form (for of such form Induction and Example are not recipient [?]) proceeds either [1°], From genus to species universally with a universal conclusion; or [2°], From species to genus with a particular conclusion; or [3°], A distraction of two species takes place; or [4°], There is a concatenation of a plurality of causes and effects. Nor are there more modes of argumentation, if we judge with skill.

"The process from genus to species engenders the First Figure. And the consequence is valid from the genus with a universal sign both affirmatively and negatively to the species, — this is naturally manifest. The process from species to genus with a particular conclusion engenders the Third Figure. And it is evident that, the species posited, the genus is posited.

"The distraction of species engenders the Second Figure. And the reason of the consequence is clear, because disparate species are necessarily sundered. These may be judged of by common sense, without any lengthened teaching. Both are manifest, — that the figures are rightly distributed, and that the consequences are indubitably valid."

### (i) ARNAULD.

Arnauld, *L'Art de Penser (Port Royal Logic)*, P. iii. ch. 11, p. 235. — General principle of syllogisms: — "*That one of the premises should contain the conclusion, and the other show that it does so contain it.*" — [So Purchot, *Instit. Phil.*, Vol. I. P. iii. ch. 1.]

Ch. v., p. 215. — "Foundation of First Figure."

"Principle of affirmative moods: — *That what agrees with a notion taken universally, agrees also with all of which this notion is affirmed; in other words, with all that is the subject of this notion, or is composed within its sphere.*" [Or, more shortly (says Purchot, c. vi.), *Whatever is predicated of the superior, is predicated of the inferior.*]

"Principle of the negative moods: — *What is denied of a notion taken universally, is denied of all whereof this notion is affirmed.*" [Purchot — *What is repugnant to the superior, is repugnant also to the inferior.* Ch. vi. p. 217.]

"Foundation of the Second Figure.[1] Principle of the syllogisms in Cesare and Festino: — *That what is denied of a universal notion, is denied also of whatever this notion is affirmed, that is to say, of all its subjects.*

"Principle of the syllogisms of Camestres. Baroco: — *All that is contained under the extension of a universal notion, agrees with none of the subjects whereof that notion has been denied, seeing that the attribute of a negative proposition is taken in its whole extension.*"

Ch. vii., p. 220. "Foundation of the Third Figure.

"Principle of the affirmative moods: — *When two terms may be affirmed of the same thing, they may also be affirmed of each other, taken particularly.* [So Purchot nearly.]

"Principle of the negative moods: — *When of two terms the one may be denied, and the other affirmed, of the same thing, they may be particularly denied of each other.*" [So Purchot nearly.]

No foundation or principle given for the Fourth Figure.

### *(j) GROSSER.*

Samuelis Grosseri, *Pharus Intellectus*, 1697, P. iii. S. i. Mem. 3, c. 2 (probably from Weiss, see Pref.). — "The foundation of the first figure is the Dictum de Omni et Nullo; for whatever is universally affirmed or denied of a universal subject, that is also affirmed or denied of all and each contained under that subject.

"The foundation of the second figure is Contrariety; for the predicates of contrary things are contrary.

"The foundation of the third figure is the agreement of the extremes in any third; for what agrees with any third agrees with each other, and may be joined or separated in the same proposition, inasmuch as they are in agreement or confliction in relation to any third thing."

Illustrates the three figures by three triangles, p. 132. In the first, we ascend to the apex on one side, and descend on the other; in the second, we ascend at both sides; in the third, we descend on both sides.

### *(k) LAMBERT.*

Lambert, *Neues Organon*, Vol. I. § 225. (See Melanchthon, p. 641.)

Relation of Figures. — "We further remark, that the first discoverer of Syllogisms and their Figures was, in his arrangement of their propositions, determined by some arbitrary circumstance: his views and selections at least were not founded on aught natural and necessary (§ 196). He places, to wit, that premise after the other which contains among its terms the subject of the conclusion, probably in order to introduce into all the figures a common law. To that law, however, we do not restrict ourselves either in speech or in writing. The mathematician, who, perhaps, draws the greatest number of formal syllogisms with the fewest paralogisms, commences to take the first figure, for example, not with the major, but with the minor proposition, because not only in this figure is such premise always the more obtrusive, but also because its subject is the proper matter of discourse. Frequently the premise is only quoted, or it is absolutely omitted whensoever it is of itself obvious to the reader, or is easily discoverable from the minor and conclusion. The conclusion inferred is then, in like manner, constituted into the minor proposition of a new syllogism, wherewith a new major is connected. This natural arrangement of the syllogisms of the first figure rests, consequently, altogether on the principle, — *That we can assert of the subject of an affirmative proposition whatever we may know of its predicate: or what may be said of the attribute of a thing is valid of the thing itself.* And this is what the syllogisms of the first Figure have peculiar to themselves. It is also so expressed: — *What is true of the genus, is true also of each of its species.*

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[1] Purchot says this Figure rests upon a single principle — *Two things are not the same, but something agrees with the one, which is repugnant to the other.*

§ 226. "On the other hand, in the second and third Figures there is no talk of species and genera. The second Figure denies the subjects of each other, because they are diverse in their attributes; and every difference of attribute is here effectual. We, consequently, use this figure principally in the case where two things ought not to be intercommuted or confounded. This becomes necessarily impossible, so soon as we discover in the thing A something which does not exist in the thing B. We may, consequently, say that syllogisms of the second figure lead us to distinguish things, and prevent us from confounding notions. And it will be also found that in these cases we always use them.

§ 227. "The third Figure affords Examples and Exceptions; and, in this Figure, we adduce all *exempla in contrarium.* The two formula are as follows:

"1. *There are* B *which are* C; *for* M *is* B *and* C.

"2. *There are* B *which are not* C; *for* M *is* B *and not* C.

"In this manner we draw syllogisms of the Third Figure, for the most part, in the form of copulative propositions (§ 135); because we are not wont twice to repeat the subject, or to make thereof two propositions. Sometimes one proposition is wholly omitted, when, to wit, it is self-manifest.

"In the Fourth Figure, as in the First, species and genera appear only with this difference, that in the moods, *Baralip*, *Dibatis*, *Fesapo*, *Fresison*, the inference is from the species to the genus; whereas, in *Calentes*, there is denied of the species what was denied of the genus. For where the genus is not, neither are there any of its species. This last mood we, therefore, use when we conclude negatively *a minori ad majus*, seeing that the genus precedes, and is more frequently presented than any of its species.

§ 229. "The syllogisms of the four Figures are thus distinguished in relation to their employment, in the following respects:

"1. The First Figure ascribes to the thing what we know of its attribute. It concludes from the genus to the species.

"2. The Second Figure leads to the discrimination of things, and relieves perplexity in our notions.

"3. The Third Figure affords examples and exceptions in propositions which appear general.

"4. The Fourth Figure finds species in a genus in *Baralip* and *Dibatis;* it shows that the species does not exhaust the genus in *Fesapo*, *Fresison*; and it denies the species of what was denied of the genus in *Calentes*.

§ 230. "This determination of the difference of the Four Figures is, absolutely speaking, only manifested when we employ them after natural fashion, and without any thought of a selection. For, as the syllogisms of every figure admit of being transmuted into those of the first, and partly also into those of any other, if we rightly convert, or interchange, or turn into propositions of equal value, their premises; consequently, in this point of view, no difference subsists between them; but whether we in every case should perform such commutations, in order to bring a syllogism under a different figure, or to assure ourselves of its correctness, — this is a wholly different question. The latter is manifestly futile. For, in the commutation, we must always undertake a conversion of the premises, and a converted proposition is assuredly not always of equal evidence with that which we had to convert, while, at the same time, we are not so well accustomed to it; for example, the proposition, *Some stones attract iron*, every one will admit, because *The magnet is a stone*, and *attracts iron*. This syllogism is in the Third Figure. In the first, by conversion of one of its premises, it would run thus:

Major, — *All magnets attract iron;*
Minor, — *Some stones are magnets;*
Conclusion, — *Some stones attract iron.*

Here we are unaccustomed to the minor proposition, while it appears as if we must pass all stones under review, in order to pick out magnets from among them. On the other hand, that *the magnet is a stone*, is a proposition which far more naturally suggests itself, and demands no consideration. In like manner, *A circle is not a square: for the circle is round, the square not.* This proof [in the third figure] is as follows, when cast in the first:

*What is not round is no circle;*
*A square is not round;*
*Consequently, etc.*

Here the major proposition is converted by means of *terminus infinitus*, and its truth is manifested to us only through the consciousness that *all circles are round*. For, independently of this proposition, should we not hesitate — there being innumerable things which are *not* round — whether the circle were one of those which belonged to this category? We think not; because we are aware.

§ 231. "It is thus apparent that we use every syllogistic figure there, where the propositions, as each figure requires them, are more familiar and more current. The difference of figures rests, therefore, not only on their form, but extends itself, by relation to their employment, also to things themselves, so that we use each figure where its use is more natural: *The first for finding out or proving the Attributes of a thing; the second for finding out or proving the Difference of things; the third for finding out and proving Examples and Exceptions; the fourth for finding out and excluding the Species of a Genus.*

§ 232. "Further, whether the three last figures are less evident than the first, is a question which has been denied [affirmed (?)] on this account, that the first figure only rests immediately on the *Dictum de Omni et Nullo* [§ 220], whilst the others have hitherto, by a circuit, been educed therefrom. We have already remarked [§ 211] that this circuit, through our mode of notation, is wholly superseded. We need, therefore, only translate its principle into the vernacular, and we shall find that the *Dictum de Omni et Nullo* is on that account applicable to the first figure, because its truth is based on the nature of the proposition. From this principle, therefore, the first figure and its moods admit of an immediate deduction; it is thus only a question whether the other figures are incapable [capable (?)] of such immediate deduction, or whether it is necessary previously to derive them through the first figure. Our mode of notation shows that the latter is an [unnecessary] circuit, because every variety of syllogism admits for itself a various notation, and because, in that case, the premises are taken for what they actually are. Consequently, every figure, like the first, has its own probation, — a probation drawn exclusively from the natures of the propositions. The whole matter is reduced to this: — *Whether a notion, wholly or in part, is, or, wholly or in part, is not, under a second: and whether, again, this second, wholly or in part, is, or, wholly or in part, is not, under a third.* All else proceeds only on the interchange of equivalent modes of expression, — the figured, namely, and those which are not figured. And this interchange we may style translating, since the figured modes of expression may be regarded as a special language, serving the purpose of a notation. We have above (§ 220), after all the syllogistic moods were discovered and denoted, adduced the *Dictum de Omni et Nullo*, but only historically, since our manner of determining the syllogistic moods is immediately founded on the nature of the propositions, from which this *Dictum* is only a consequence. Moreover, this consequence is special, resting, as it does, on the notions of *Species* and *Genera*. Wherefore, its validity only extends so far as propositions can be recalled to these notions; as, for example, in the First Figure. In the Second, the notion of *Difference* emerges; and in the Third, the notion of *Example*. If we, therefore, would have special *dicta* for the several Figures, in that case it would follow, and, at the same time, become manifest that the middle term of a syllogism, considered for itself, expresses, in the First Figure, a principle [*of Ascription or Procreation*]; in the Second, *Difference*; in the Third, an *Example*; and in the Fourth, the principle of *Reciprocity*.

"1. For the First Figure. *Dictum de Omni et Nullo.* What is true of all A, is true of every A.

"2. For the Second Figure. *Dictum de Diverso.* Things which are different, are not attributes of each other.

"3. For the Third Figure. *Dictum de Exemplo.* When we find things A which are B, in that case some A are B.

"4. For the Fourth Figure. *Dictum de Reciproco.* I. If no M is B, then no B is this or that M. II. If C is [or is not] this or that B, in that case some B are [or are not] C."

### (l) *PLATNER.*

Platner, *Philosophische Aphorismen*, 3d ed., 1793. — Part I., § 544, conformed to his *Lehrbuch der Logik und Metaphysik*, 1795, § 227. "The reason why the predicate belongs to the subject is in all possible syllogisms this, — because the subject stands in a relation of subordination with [is either higher or lower than] a third notion to which the predicate belongs. Consequently, all inference proceeds on the following rule: If the subject of the [concluding] judgment stand in a relation of subordination with a third notion, to which a certain predicate pertains; in that case, this predicate also pertains to the same judgment, affirmatively or negatively."

In his note on this Aphorism, Platner *(Lehrbuch)* admits — "My fundamental rule is only at fault in the second Aristotelic figure, which, however, is no genuine figure; because here, in the premises, the subject and predicate have changed places," etc. In the 2d edition of his *Aphorisms* (1784) he had adopted the principle of Identity with the same third, as he has it: "*In what extension or proportion (Maasse) two notions are like or unlike to a third, in the same extension or proportion are they like or unlike each other.*" (§ 628.)

*Philosophische Aphorismen*, Part I., third edition, 1793, § 568, compared with second, 1784, § 672–676. — "Nevertheless, each of these grammatical figures of syllogism has its peculiar adaptation in language for the dialectical application of proofs: and the assertion is without foundation that the first is the most natural. Its use is only more appropriate, when we intend to show — *that a predicate pertains [or does not pertain] to a subject in virtue of its class.* More naturally than the first do we show, in the second, *the difference of things apparently similar:* and in the third, *the similarity of apparently different things.* The fourth figure [it is said in the second edition], on account of the position of its terms, is always unnatural in language."

*Philosophische Aphorismen*, Part I., last edition, 1793, § 561. — "The principle of the first figure is the *Dictum de Omni et Nullo.*"

§ 564. — "Touching the other figure [the third, for in this edition Platner abolishes, in a logical relation, the second], its special principle is the following rule: — *What belongs to the subordinate, that, since the subordinate is a part of the universal, belongs also in part (particularly) to the universal.*"

In the second edition, 1784, the second figure is recognized, and, with the third, obtains its special law.

§ 659. — "The principle of the second figure is: — *If two notions, wholly or in part, are opposite to a third, so are they also, wholly or in part, opposite to each other.*"

§ 664. — "The principle of the third figure is: — *What can be particularly affirmed or denied of a subaltern species, that also, in so far as such subaltern species is part of a genus, may be particularly affirmed or denied of the genus.*"

*Philosophische Aphorismen.* Part I., § 546. Note. — "In general, logicians treat the subject as if it were necessarily subordinated to the predicate. It may, however, on the contrary, be the higher notion, and the predicate thus be subordinated to it. This is the case in all particular propositions where the predicate is not an attribute of the genus, but an accident of the subject. For instance, — *Some creatures are animals;* here the subject is the higher: *Some* *men are imperfect;* here the higher is the predicate. We must not, therefore, in our syllogistic, thus enounce the fundamental rule of reasonings, — *If the subject be subordinated to a third notion*, but *with or in the relation of subordination with a third notion.*"

### (m) — FRIES.

Fries, *System der Logik*, § 56. — "The species of categorical syllogisms are determined by the variety of relations in which three notions may stand to each other, so that a syllogism may be the result.

"These relations may be thought as three.

"Case I. — Three notations are reciprocally subordinated in gradation, so that the second is subordinated to the first, but superordinated to the third.

"Case II. — Two notions are subordinated to a third.

"Case III. — Two notions are superordinated to a third.[1]

"When, in these cases, is a syllogism possible?

§ 57. — "In all the three cases the syllogisms are equally valid, for they are founded on the general laws of the connection of notions.

"They all follow, to wit, from the relation of a whole sphere to its parts, which lies in the *Dictum de Omni et Nullo.* The principles for the three mentioned cases are thus:

"For the first, — *The part* (C) *of the part* (B) *lies in the whole* (A), *and what* (A) *lies out of the whole* (B), *lies also out of its parts* (C).

"For the second, — *What* (A *or some* A) *lies out of the whole* (B), *lies also out of its parts* (C).

"For the third, — *If a part* (B) *lies in two wholes* (A *and* C), *in that case these have a part in common; and if a part* (B) *lie in a whole* (C), *but out of another whole* (A), *in that case the first* (C) *has a part out of the other* (A).

"The first case alone coincides immediately with the perfect declaration of a syllogism, — that a case is therein determined by a rule. For the third case, therefore, our two declarations of a major premise — that *it is the rule*, and that *it contains the major term* — do not coincide, seeing that here the minor term may be forthcoming in the rule. On this account the arrangement of the first case is said to be the only *regular*, and the *others are reduced to it.* That this reduction is easily possible, we may in general convince ourselves, by reflecting that every syllogism requires a general rule as premise, and that the other cases are only distinguished from the first by a converted arrangement of the propositions. But as all propositions may be either purely converted or purely counterposed, consequently the two last cases can at most so far deviate from the first that they are connected with the first case only through reversed *(gegentheilige)* notions.

§ 57 b. — "The doctrine of the several species of categorical syllogisms, as regulated by the forms of their judgments, is at bottom an empty subtlety; for the result of all this circuity is only that, in every categorical syllogism, a case is determined by a rule, and this is already given in the law, that in every reasoning one premise must be universal. The scholastic logic treats of this doctrine only in so far as the species of syllogism are determined by the forms of judgment, and thereby only involves itself in long grammatical discussions. Aristotle has been falsely reproached for overlooking the fourth figure, he only having admitted three. For Aristotle proceeds, precisely as I have here done, only on the relation of notions in a syllogism, of which there are possibly only our three cases. His error lies in this, — that he did not lay a general rule at the root of every figure, but, with a prolixity wholly useless, in determining the moods of the several figures, details each, even of the illegitimate, and demonstrates its illegitimacy. This prolixity has been too often imitated by other logicians, in the attempts at an evolution of the moods. Kant goes too far in denouncing this whole doctrine as a mere grammatical subtlety. The distinction of the three cases is, however, a logical distinction; and his assertion that the force of inference in the other two is wholly derived from that of the first case, is likewise not correct. I manifestly, however, conclude as easily in the third case, — 'A part which lies in two wholes is a part common to both,'— as in the first, — 'The part of the part lies in the whole.' The third case presents, indeed, the readiest arrangement for reasonings from the particular to the general, *i. e.*, for syllogisms in the second figure according to our terminology.

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[1] [See Jordano Bruno (in Denzinger, *Logik*, t. ii. p. 259). Stattler, *Logica*, § 237, p. 163.]

" The scholastic doctrine of the four syllogistic figures and nineteen moods of categorical syllogisms requires no lengthened illustration. If the figures are determined by the arrangement of notions in the premises, then the following combination is exhaustive. For the conclusion in all cases S——P [being supposed the same], the [terms or] notions stand:

1) According to our first case, M——P
S——M
2) With converted major premise, P——M
S——M
3) With converted minor premise, M——P
M——S
4) Both premises converted, P——M
M——S

" Should we therefore simply convert both premises in a syllogism of the first figure, we are able to express it in all the figures. Let the notions given be *fireproof*, *lead*, *metal*, there then follows the conclusion — *Some metal is not fireproof* — from the premises:

In the First Figure — *No lead is fireproof;*
*Some metal is lead;*
In the Second Figure — *Nothing fireproof is lead;*
*Some metal is lead;*
In the Third Figure — *No lead is fireproof;*
*All lead is metal;*
In the Fourth Figure — *Nothing fireproof is lead;*
*All lead is metal.*

" It is here apparent that the first three figures are our three cases; but the fourth we did not employ, as it contains no peculiar relations or notions, but only under our first case superordinates, and then subordinates a middle term. This manner of enunciating a syllogism is thus only possible where we are competent, through conversions, to transmute the arrangement of the first figure into that of the fourth. Now this happens: 1] If we convert the conclusion S———P into P———S, since then the major and the minor terms, as also the major and minor premises, change names; or, 2] If both premises allow of an immediate conversion, so that the one remains universal; for then the converted propositions contain the same thoughts as those given, and, consequently, establish the same conclusion."

[Objections to Fries' doctrine of figure — 1°, Only applies to affirmatives; 2°, Only the arrangement of the results of a successful comparison, and takes no heed of the comparison that may have been fruitless (the illegitimate moods); 3°, Takes account of only one subordination, for, in the second and third cases, in each there is a reciprocal subordination in Extension and Comprehension.]

### (n and o) *KRUG AND BENEKE — THEIR DOCTRINES OF SYLLOGISM CRITICIZED.*

The authority of the two following philosophers, who conclude this series, is rather negative than positive; inasmuch as they both concur in proving that the last attempts at a reformation of the Syllogistic Theory proceed on a wholly different ground from that on which, I think, this alone can be accomplished. These two philosophers are Krug and Beneke; for, beside them, I am aware of no others by whom this has been attempted.

Krug was a disciple of the Kantian school, Kant's immediate successor in his Chair of Logic and Metaphysics at Kœnigsberg, and, subsequently, Professor of Philosophy in the University of Leipsic. He is distinguished not only as a voluminous writer, but as a perspicuous and acute thinker; and his peculiar modification of the Kantian system, through a virtual return to the principle of Common Sense, is known among the German theories by the name of *Synthetism.* His *Logic* (the first part of his *System of Theoretical Philosophy*) was published in 1806, and is one of the best among the many excellent treatises on that science which we owe to the learning and ability of the Germans. (I have before me the fourth edition, that of 1833.) Krug propounded a new theory of syllogistic; but the novelty of his scheme is wholly external, and adds only fresh complication to the old confusion. It has, accordingly, found no favor among subsequent logicians.

Passing over the perverse ingenuity of the principles on which the whole doctrine is founded, it is enough to state that Krug distributes the syllogistic moods into eight classes. Of these, the first (which, with some other logicians, he considers not as a figure at all, but as the pure, regular, and ordinary form of reasoning) corresponds to the First Figure of the Aristotelico-Scholastic distribution. The other seven classes, as so many impure, irregular, and extraordinary forms, constitute (on the analogy of Rhetoric and Grammar) so many *figures.* Of these, the new is only the old *First Figure*, the minor premise, in extension, being stated before the major. Krug, like our other modern logicians, is not aware that this was the order in which the syllogism was regularly cast, in common language, by the Greeks, by the Arabians, by the Jews, and by the Latins prior to Boethius.[1] The old and new first figures are only a single figure, the syllogism being drawn in the counter orders of breadth and of depth. A mood in these orders, though externally varying, is intrinsically, is schematically, the same. Krug's distinction of his new first figure is, therefore, null. Thus, Barama is Barbara; Caleme is Celarent; Dirami is Darii; Firemo is Ferio. Nor is his discrimination of the other six better founded. His new (the old) *Second* and his *Fifth* Figures are also one. The latter is precisely the same with the former; *Fimeso* is *Festino*, and *Fomaco* is *Baroco*. In one case (under *Camestres*), Krug adopts, as alone right, the conclusion rejected by the logicians. In this, he and they are, in fact, both wrong, though in opposite ways. Each mood, in the second (as in the third) figure, has two indifferent conclusions; and the special one-sided practice of the former is only useful as gainsaying the general one-sided precept of the latter. The same objection applies to Krug's new (the old) *Third*, in connection with his *Sixth* Figure. They are one; *Daroco* is *Bocardo*, *Fapimo* is *Felapton*, and *Fixemo* is *Ferison*. In two cases (under *Disamis* and *Bocardo*) Krug has recognized the repudiated conclusion. Krug (§ 109) has, however, committed an error in regard to Bocardo. He gives, as its example, the following syllogism, in which, for brevity, I have filled up the quantifications:

> "*Some animals are not* [*any*] *viviparous;*
> *All animals are* [*some*] *organized things;*
> *Therefore, some organized things are not* [*any*] *viviparous.*"

In a note, he adds, "The conclusion should here be: — '*Therefore, some things which are not viviparous are (some) organized.*' And this is seen also by reduction. We have, however, followed the arbitrary precept of the logicians, that the extreme in the second proposition should stand subject in the conclusion; although it be here indifferent which extreme becomes the subject. The conclusion is only changed into another quality." Only changed into another quality! Only an affirmative conclusion from a negative premise! The legitimate inference is:

> "*Therefore, no viviparous is some organic;*" or,
> "*Therefore, any viviparous is not some organic.*"

Bachmann (*Logik*, § 135), another eminent logician, has erred with Krug. A particular predicate in a negative proposition seems indeed one of the last difficulties for reformed logic. Krug's new (the old) *Fourth* Figure bears a corresponding relation to his *Seventh*. He is right, certainly, in abolishing all the moods of the fourth figure except *Fesapo* and *Fresiso;* and, from his point of view, he is hardly to be blamed for not abolishing these likewise, along with the correlative moods *Fapesmo* and *Frisesmo*, and, with them, his seventh figure. Finally, rejecting the scholastic doctrine of Reduction, he adopts, not without sundry perverse additions, Kant's plan of accomplishing the same end; so that Krug's conversive and contrapositive and transpositive interpolations,

[1] See p. 625 — Ed.

by which he brings back to propriety his sevenfold figured aberrations, are merely the substitution of one "false subtlety" for another. He, and Bachmann after him, renounce, however, "the crotchet of the Aristotelians," in making the extreme of the prior premise the predicate, always, of the conclusion, in the first and second figures; and, though both do this partially and from an erroneous point of view, their enunciation, such as it is, is still something.

Professor Beneke, of Berlin, is the last to whom I can refer, and in him we have, on the point in question, the final result of modern speculation. This acute and very original metaphysician stands the uncompromising champion of the philosophy of experience, against the counter doctrine of transcendentalism, in all its forms, now prevalent in Germany; and, among the other departments of mental science, he has cultivated the theory of reasoning with great ability and success. In 1832 appeared his *Lehrbuch der Logik*, etc.; in 1839, his *Syllogismorum Analyticorum Origines et Ordo Naturalis*, etc.; and in 1842, his *System der Logik*, etc., in two volumes. In Logic, Beneke has devoted an especial share of attention to the theory and distribution of Syllogism; but it is precisely on this point, though always admiring the ingenuity of his reasonings, that I am compelled overtly to dissent from his conclusions.

The Syllogistic of Beneke is at once opposed, and correspondent, to that of Krug; there is an external difference, but, without imitation, an internal similarity. Instead of erroneously multiplying the syllogistic figures, like the Leipsic philosopher, the philosopher of Berlin ostensibly supersedes them altogether. Yet, when considered in essence and result, both theories agree in being, and from the same side, severally, the one an amplification, the other an express doubling, of the nineteen scholastic moods. In this, both logicians were unaware that the same had been long ago virtually accomplished in the progress of the science; neither considered that the amplification he proposed was superficial, not to say mistaken; and that, instead of simplicity, it only tended to introduce an additional perplexity into the study. Beneke has the merit of more openly relieving the opposition of Breadth and Depth, in the construction of the syllogism; and Krug, though on erroneous grounds, that of partially renouncing the old error of the logicians in regard to the one syllogistic conclusion, in the second and third figures. But, in his doctrine of moods, Beneke has, I think, gone wrong in two opposite ways: like Krug, in his arbitrary multiplication of these forms; like logicians in general, in their arbitrary limitation.

In regard to the former — the counter quantities of breadth and depth do not discriminate two moods, but merely two ways of stating the same mood. Accordingly, we do not multiply the moods of the first figure, to which alone the principle applies, by casting them in the one dependency and in the other; we only show that, in that figure, every single mood may be enounced in a twofold order, more german, the one to the quantity of extension, the other to the quantity of intension. An adequate notation ought, equally and at once, to indicate both. But in reference to the second and third figures, the case is worse. For in them we have no such dependency at all between the extremes; and to double their moods, on this principle, we must take, divide, and arbitrarily appropriate, one of the two indifferent conclusions. But, as every single mood of these figures has a double conclusion, this division cannot be made to difference their plurality. If Professor Beneke would look *(instar omnium)* into Apuleius or Isidorus, or, better than either, into Blemmidas, he will find all his new moods (not, of course, those in the fourth figure) stated by these, as by other ancient logicians; who, however, dreamed not that the mere accidental difference of, what they called, an *analytic* and *synthetic* enouncement, determined any multiplication of the moods themselves.

In the latter respect, Dr. Beneke has only followed his predecessors; I, therefore, make no comment on the imperfection. But, in accomplishing what he specially proposes, whilst we do not find any advancement of the science, we find the old confusion and intricacy replaced by another, perhaps worse. To say nothing of his non-abolition of the fourth figure, and of his positive failures in doubling its moods, the whole process is carried on by a series of arbitrary technical operations, to supersede which must be the aim of any one who would reconcile Logic with nature. His new (but which in reality are old) amplifications are brought to bear (I translate his titles) through "Commutations of the Premises, — by Subalternation, — by Conversion, — by Contraposition;" and "of the Major, — of the Minor," — in fact, of both premises (*e. g.*, *Fesapo*, etc.). And so difficult are these processes, if not so uncertain the author's language, that, after considerable study, I am still in doubt of his meaning on more points than one. I am unable, for example, to reconcile the following statements: — Dr. Beneke repeatedly denies, in conformity with the common doctrine, the universal quantification of the predicate in affirmative propositions; and yet founds four moods upon this very quantification, in the conversion of a universal affirmative. This is one insolubility. But there arises another from these moods themselves (§ 28–31). For, if we employ this quantification, we have moods certainly, but not of the same figure with their nominal correlatives; whereas, if we do not, simply rejecting the permission, all slides smoothly, — we have the right moods in the right figure. This, again, I am unable to solve. Dr. Beneke's duplication of the moods is also in sundry cases only nominal; as is seen, for example, in Ferio 2, Fesapo 2, and Fresiso 2, which are forms, all, and in all respects, identical. I must protest also against his violence to logical language. Thus, he employs everywhere "non omne," "non omnia," "alle sind nicht," etc., which is only a particular (being a mere denial of omnitude), for the absolute or universal negative, "nullum," "nulla," "kein ist," *no*, *none*, *not any*, etc., in opposition both to principle and to the practice of Aristotle and succeeding logicians.

### (p) *TITIUS.*

Gottlieb Gerhard Titius, *Ars Cogitandi, sive Scientia Cogitationum Cogitantium, Cogitationibus Necessaris Instructa et a Peregrinis Liberata.* Leipsiæ, 1723 (first edition, 1701).

Titius has been partially referred to, by Sir W. Hamilton, as having maintained the doctrine of a Quantified Predicate. See above, p. 555. His theory of the Figure and Mood of Syllogism is well deserving of notice, — proceeding, as it does, on the application of that doctrine. This theory is principally contained in the following extracts from his *Ars Cogitandi*, which show how closely he has approximated, on several fundamental points, to the doctrines of the *New Analytic*.[1]

Titius gives two canons of syllogism:

I. Affirmative. "Quæcunque conveniunt in uno tertio, illa etiam, juxta mensuram illius convenientiæ, inter se conveniunt."

II. Negative. "Quæcunque pugnant in certo aliquo tertio, illa, juxta mensuram illius disconvenientiæ, etiam inter se pugnant." C. ix. §§ 30, 27.

The following relates to his doctrine of Figure and Mood, and to the special rules of Syllogism, as commonly accepted:

C. x. § i. "Sic igitur omnium Syllogismorum formalis ratio in genuina medii termini et prædicati ac subjecti Conclusionis collatione consistit; eam si dicere velis *formam essentialem* aut *figuram generalem*, vel *communem*, non valde reluctabor.

§ ii. "Præter eam vero Peripatetici *Figuras* ex *peculiari medii termini situ* adstruunt, ea ratione ut *Primam* figuram dicant, in qua medius terminus in Majore est subjectum, in Minore Prædicatum, *Secundam*, ubi idem bis prædicati, et *Tertiam*, ubi subjecti locum bis subit. Galenus adjecit *Quartam* primæ contrariam, in qua medius terminus in majore est prædicatum, in minore subjectum, quam pluribus etiam exposuit Autor. *Art. Cog.* p. 3, c. 8.

§ iii. "Cæterum illæ figuræ tantum sunt *accidentales*, ab iisque vis concludendi non dependet. Quodsi tamen quis diversum medii termini situm attendendum esse putet, tum nec Quarta figura negligenda esse videtur, licet eam Peripatetici nonnulli haut curandam existiment, *vide* Ulman. *Synops. Log.* l. 3, c. 2, p. 164.

§ iv. "Interim *Prima* cæteris magis naturalis ex eo videri potest, quod Subjectum et Prædicatum Conclusionis in Præmissis suam retineat qualitatem, cum in *secunda et tertia* alterum qualitatem suam exuere, in *quarta* vero utrumque eam deponere debeat.

§ v. "Postea in unaquaque figura, pro ratione quantitatis et qualitatis propositionum, peculiares *Modi* adstruuntur, ita quidem ut Primæ figuræ *Quatuor*, *totidem* Secundæ, Tertiæ *sex* attribuantur, ex quibus etiam debite variatis Quarta *quinque* accipiat, prout illa passim cum vocabulis memorialibus recenseri solent, ut illa quidem huc transcribere opus non sit, *vide* Autor, *Art. Cogit.*, p. 3, c. 5, 6, 7, 8.

§ vi. "Non opus esse istis figuris et modis ad dijudicandam Syllogismorum bonitatem, ex monito § 3, jam intelligi potest. Quomodo tamen sine iis bonitas laudata intelligi queat, id forte non adeo liquidum est. . . . . . .

§ vii. "Non diu hic quærenda sunt remedia: Observetur forma essentialis seu figura communis, ac de veritate Syllogismi recte judicabitur. Applicatio autem hujus moniti non est difficilis, nam primo respiciendum ad conclusionem, deinde ad medium terminum, quo facto etiam judicari potest. an ejus et terminorum conclusionis collatio in præmissis recte sit instituta nec ne. . . .

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§ ix. "De cætero uti anxie jam non inquiram, an omnis bene concludendi

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[1] For Titius' doctrine of a Quantified Predicate, its application to the Conversion of Propositions and to the Hypothetical Syllogism, see above, pp. 555, 527, 603. — Ed.

ratio *numero modorum denario* circumscribatur. quod quidem juxta ἀκρίβειαν mathematicam demonstrasse videri vult Autor. *Art. Cog.* p. 3, c. 4, ita id haut admiserim, quod illi *modi*, quos vulgo laudant, Primæ, Secundæ aut Tertiæ figuræ præcise sint assignandi, licet hoc itidem acumine mathematico se demonstrasse putet dictus Autor. *d. l. c.* 5 *seqq.*

§ x. " Cum enim quævis propositio possit converti, modo quantitas prædicati probe observetur, hinc necessario sequitur, quod quivis Syllogismus, adhibita propositionum conversione, in quavis figura possit proponi. ex quo non potest non æqualis modorum numerus in unaquaque figura oriri, licet illi non ejusdem semper sint quantitatis.

§ xi. " Operæ pretium non est prolixe per omnia Syllogismorum singulis figuris adscriptorum exempla ire, sufficiat uno assertionem illustrasse, v. gr. in prima figura, modo *Barbara* hic occurrit Syllogismus apud *d.* Autor. c. 5.

*O. sapiens subjicitur voluntati Dei,*
*O. honestus est sapiens,*
*E. O. honestus subjicitur voluntati Dei.*

§ xii. " Hunc in secunda figura ita proponere licet:

*Quidam, qui subjicitur voluntati Dei, est omnis sapiens,*
*Omnis honestus est sapiens,*
*E. omnis honestus subjicitur voluntati Dei,*

ratio concludendi manet eadem, *sapiens* enim et *is qui subjicitur voluntati Dei*, uniuntur in Majore, dein *sapiens et honestus* in Minore, ergo in conclusione idea *sapientis* et *Ejus qui voluntati Dei subjicitur*, quoque conveniunt.

§ xiii. " In tertia figura ita se habebit:

*O. sapiens subjicitur voluntati Dei,*
*Q. sapiens est omnis honestus,*
*E. O. honestus subjicitur voluntati Dei,*

nec in hac concludendi ratione aliquid desiderari potest, nam medius terminus universaliter unitur cum conclusionis prædicato, deinde, quantum sufficit, conjungitur cum ejusdem subjecto, seu *omni honesto*, ergo subjectum et prædicatum se quoque mutuo admittent.

§ xiv. " Cæterorum eadem est ratio, quod facile ostendi posset, nisi tricas illas vel scribere vel legere tædiosum foret. Ex his autem sequitur, quod *omnes regulæ speciales, quæ modis vulgaribus attemperatæ vulgo circumferuntur, falsæ sint*, quod speciatim ostendere liceat.

§ xv. " In universum triplici modo impingitur, vel enim *conclusio creditur absurda, quæ talis non est*, vel *vitium est in materia, ac altera præmissarum falsa*, vel *adsunt quatuor termini*, adeoque absurditas conclusionis, si aliqua subest, nunquam ab ea causa dependet, quam referunt regulæ.

§ xvi. " Sed videamus distinctius (1) *major in prima figura semper sit universalis.* . . . . . .

§ xvii. "Inflectam huc exemplum minus controversum, quod Autor, *Art. Cog.* p. 3, c. 7, in modo *Disamis*, tertiæ figuræ, proponit:

*Quidam impii in honore habentur in mundo,*
*Quidam vituperandi sunt omnes impii,*
*E. quidam vituperandi in honore habentur in mundo.*

§ xviii. "Hic habes primam figuram cum majore particulari, optime iterum concludentem, nam licet medius terminus particulariter sumatur in majore, ejus tamen ille est capacitatis, ut in eodem convenientia prædicati et subjecti ostendi queat, et nisi hoc esset, nec in tertia figura rite concluderetur.

§ xix. "Nec valde obsunt, quæ vulgo illustrandæ regulæ adducuntur. Ex sententia Weis. *in Log.* p. 1, *lib.* 2, c. 2, § 4, male ita concluditur:

*Q. animal volat,*
*O. leo est animal,*
*E. Q. leo volat.*

Verum si animal sumitur in minore sicut in majore, tum illa falsa est, si vero alio sensu, tum existunt quatuor termini; his ergo causis, non particularitati Majoris, vitiosa conclusio tribuenda.

§ xx. "Nam alias ita bene concluditur:

*Q. animal volat,*
*O. avis est animal* (illud quoddam),
*E. O. avis volat,*

nam licet medius terminus particularis sit, tantæ tamen est latitudinis, ut cum utroque Conclusionis termino possit uniri.

§ xxi. "Porro (2) *Minor semper sit affirmans.* Sed quid desiderari potest in hoc Syllogismo:

*O. homo est animal rationale,*
*Leo non est homo,*
*E. non est animal rationale?*

et nonne illa ratio concludendi manifeste bona est, quæ subjectum et prædicatum, quæ in certo tertio non conveniunt, inter se quoque pugnare contendit?

§ xxii. "Sed ais, mutemus paululum Syllogismum et absurditas conclusionis erit manifesta:

*O. homo est animal,*
*Leo non est homo,*
*E. leo non est animal!*

Verum si terminus animalis in Conclusione perinde sumitur, sicut suppositus fuit in majore, nempe *particulariter*, tum conclusio est verissima; si autem aliter accipiatur, tum evadunt quatuor termini, quibus adeo, non negationi Minoris, absurditas conclusionis est imputanda, quæ observatio in omnibus exemplis quæ hic objici possunt et solent, locum habet.

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§ xxviii. “Sed revertamur ad regulas vulgares! Nimirum (3) *In secunda figura major sit universalis.* Verum cur non ita liceat concludere:

*Quidam dives est Saxo,*
*Quidam Germanus est omnis Saxo,*
*E. quidam Germanus est dives?*

quod argumentum Weis. l. 2, c. 4, § 2, intuitu tertiæ figuræ proponit.

§ xxix. “Argumenta, quæ fallere videntur, v. gr. quod Weisius l. 2, c. 3, § 8, profert:

*Quidam homo est sapiens,*
*Nullus stultus est sapiens,*
*E. nullus stultus est homo,*

et similia, responsione, § 22, data eliduntur; nimirum conclusio vel non absurda, si recte intelligatur, vel adsunt quatuor termini, quibus adeo, non particularitati majoris, vitium est imputandum.

§ xxx. “Amplius (4) *Ex puris affirmativis in secunda figura nihil concluditur,* sed mirum foret, si illa concludendi ratio falleret, quæ fundamentum omnium Syllogismorum affirmativorum tam evidenter præ se fert! Hoc argumentum utique formaliter bonum est:

*Omnis sapiens sua sorte est contentus,*
*Paulus sua sorte est contentus,*
*E. Paulus est sapiens.*

§ xxxi. “Sed fallunt multa argumenta, v. gr. Weisio *d.* c. 3, § 3, adductum:

*Omnis lepus vivit,*
*Tu vivis,*
*E. tu es lepus,*

verum non fallunt ob affirmationem præmissarum, sed quia vel minor falsa est, si scil. prædicatum accipiatur eodem sensu, quo in Majore sumtum est, vel quia adsunt quatuor termini, si prædicatum Minoris particulariter et alio sensu accipiatur.

§ xxxii. “Non possunt etiam vulgo diffiteri, quin ex puris affirmativis aliquando quid sequatur, verum id non vi *formæ* sed *materiæ* fieri causantur, *vide* Ulman *Log.* l. 3, c. 3, § 4. Hæc vero est petitio principii, nam quæ conveniunt in uno tertio, illa etiam inter se convenire debent, idque non fortuito, sed virtute unionis laudatæ, seu beneficio formæ.

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§ xxxiv. “In tertia figura (5) *Minor semper sit affirmans.* Ego tamen sic recte concludi posse arbitror:

*Quoddam laudandum est omnis virtus,*
*Nullum laudandum est quædam magnificentia,*
*E. quædam magnificentia non est virtus.*

§ xxxv. " Nec valde urgent exempla opposita Weisius *d.* l. 2, c. 4, § 2, hoc affert:

*Omnis homo ambulat,*
*Nullus homo est porcus,*
*E. quidam porcus non ambulat,*

nam recurrit responsio § 22 data, quæ vel conclusionem falsam non esse, vel causam falsitatis a quatuor terminis dependere ostendit, quæ etiam locum haberet, licet conclusionem universalem, *Nullus porcus ambulat*, assumas.

§ xxxvi. " Tandem (6) *In tertia figura conclusio semper sit particularis.* Verum Syllogismum cum conclusione universali, jam exhibui § 13, in Exemplis autem quæ vulgo afferuntur, v. *gr.*

*Omnis senator est honoratus,*
*Omnis senator est homo* (quidam scil.),
*E. omnis homo est hònoratus,*

*vide* Weis. *d.* l. 2, c. 4, § 3, occurrunt quatuor termini (nam homo, in minore particulariter, in conclusione universaliter sumitur), qui adeo veram absurdæ conclusionis causam, ac simul regulæ vulgaris falsitatem ostendunt.

§ xxxvii. " Illa autem omnia, quæ contra vulgares regulas hactenus disputavimus, non eo pertinent, quasi rationem concludendi rejiciendis regulis hinc inde confectam commendemus, ita ut in demonstrationibus eadem uti, aut valde delectari debeamus. Quin omni potius eo spectant, ut Peripateticos, qui formam Syllogismorum essentialem vel omnino non vel nimis frigide exponunt, in explicandis etiam eorum figuris accidentalibus, falli probarem.

. . . . . . . . . . . . . . .

§ xxxix. " Atque ex hactenus dictis etiam intelligi potest, quæ nostra de *Reductione* sit sententia. Nimirum ex nostris hypothesibus illa nihil aliud est, quam *Syllogismorum per omnes quatuor figuras accidentales, salva semper conclusione, facta variatio.*

§ xl. " Pertinet igitur illa tantum ad *Præmissa*, Syllogismus enim semper ut instrumentum veritatis inquirendæ considerari, adeoque quæstio probanda, quæ semper immobilis sit, nec, prout visum est, varietur, præsupponi debet.

§ xli. " Reductionis unica *Lex* est, ut simpliciter, juxta figuræ indolem, propositiones convertamus, quod sine ulla difficultate procedit, dummodo quantitatem subjecti et prædicati debite confideremus, ceu ex iis quæ de Conversione diximus satis liquet.

§ xlii. "*Finis* est, ut per ejusmodi variationem, terminorum unionem vel separationem eo accuratius intelligamus, hinc omnis *utilitas* reductioni non est abjudicanda, si enim recte instituatur, ingenium quantitati propositionum observandæ magis magisque assuescit, ac inde etiam in penitiorem formæ essentialis intelligentiam provehitur.

§ xliii. "In *vulgari Reductione*, quæ in libellis logicis passim exponitur, *vide* Aut. *Art. Cog.* p. 3, c. 9, quædem exempla reprehendi non debent, quando v. g. *Cesare* ad *Celarent* reducitur, nam ibi simplici conversione alicujus propositionis defunguntur, juxta legem, quam § 41, reductioni dedimus.

§ xliv. "Sed si ab illis exemplis abeas, parum vel nihil est, quod in eadem laudari debeat, dum fere ex falsis hypothesibus omnis reductio oritur, nam *conversio per contrapositionem* præsupponitur, quam tamen valde dubiam esse, supra ostendimus, præterea *peculiares modi* in singulis figuris adstruuntur, ac omnis reductio ad *primam figuram* facienda esse existimatur, cum tamen idem Syllogismus per omnes figuras variari queat.

§ xlv. "Ipsa vero reductio nullis legibus adstricta est, convertitur Conclusio, transponuntur Præmissæ, propositiones negativæ mutantur in affirmativas, atque ita quidvis tentatur, modo figura intenta obtineatur. Quo ipso puerilis error, quo Logica, pro arte concinnandi tres lineas, easque in varias formas mutandi habetur satis elucet. Inepta scientia est, quæ in verbis disponendis, circumagendis aut torquendis unice, occupatur.

§ xlvi. "Juxta hæc igitur, vulgari modo reducere, maximam partem nihil aliud est, quam errorem errore tegere, ingenia discentium torquere, ac magno conatu magnas nugas agere, inscitiamque professa opera ostendere."— ED.]

## IV. — SYLLOGISTIC MOODS.

(p. 285.)

### I. — DIRECT AND INDIRECT MOODS.

#### *(a) THEIR PRINCIPLE. — FIRST AND FOURTH FIGURE.*

(See p. 302.)

Direct and Indirect Moods — principle of. — That the two terms should hold the same relation to each other in the conclusion that they generally hold to the middle term in the premises. This determined by the Question. This constitutes direct, immediate, natural, orderly inference. When reversed, by Conversion, there emerges indirect, mediate, unnatural, irregular inference.

In the two last Figures (Second and Third), the two terms hold the same relation to the middle term in the premises; ergo, no indirect inference, but always two direct conclusions possible.

In the first Figure, as the two terms are subordinated to each other in the premises, one direct conclusion from premises, whether read in Extension or Comprehension, and, consequently, an indirect one also, — the First Figure being first figure in Extensive quantity: the Fourth Figure being first figure in Comprehensive quantity. *Direct* and indirect moods in each.

1. Blunder about definition of major and minor terms by logicians (for which Aristotle not responsible),[1] cause of fancy of a Fourth Figure, constituted by indirect moods in comprehension.

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[1] See Stahl [*Notæ et Animadversiones in Compendium Dialecticum D. Conradi Horneii, nunc primum ex Auctoris Autographo editæ cura Caspari Posneri Prof. Pub. Jenæ.* 1656, *Ad.* L. iii. c. viii.].

2. That predicate could have no prefinition, and, therefore, though they allowed its converse, the direct inference was not suffered. This in Fapesmo, Frisesmo (these alone, by some logicians, admitted in the First Figure), and Fesapo and Fresison in Fourth, or Comprehensive First.[1]

3. That major proposition, that which is placed first.

Fourth Figure. — The First Figure, and that alone, is capable of being enounced in two orders, those of Breadth and of Depth. It is exactly the same syllogism in either order; and, while the order of Depth was usually employed by the Greeks, Orientals, and older Latins, that of Breadth has been the common, if not the exclusive, mode of enouncement among the western logicians, since the time of Boethius. In either form there are thus four direct moods, and five indirect — in all nine moods; and if the Figure be held to comprise the moods of either form, it will have eighteen moods, as in fact is allowed by some logicians, and, among others, by Mendoza (*Disp. Log. et Met.* T. I. pp. 515, 516). Martianus Capella (*De Septem Artibus Liberalibus*, L. iv., *De Dialectica*, in cap. *Quid sit Prædicativus Syllogismus* — see p. 639) states and allows either form, but, like his contemporaries, Greek and Latin, he employs in his examples the order of Depth.

Now, mark the caprice of the logicians of the West subsequent to Boethius. Overlooking entirely the four direct moods in the order of Depth, which they did not employ, as the conclusion would, in these cases, have been opposed to their own order; they seized upon the five indirect moods of the order of Depth, as this afforded a conclusion corresponding to their own, and constituted it, thus limited, into a Fourth Figure.

Did not make two forms of First Figure.

An indirect conclusion is in subject and predicate the reverse of a direct; opposed, therefore, to the order of predication marked out by the premises which the direct conclusion exclusively follows. An indirect conclusion (what the logicians have not observed)[2] is an inference from the direct conclusion, and, therefore, one mediate from the premises.

### (b) MOODS OF FOURTH FIGURE REDRESSED.

(Early paper — previous to 1844. Later signs of quantity substituted. — Ed.)

I. Bamalip, — only Barbara with transposed premises and converted conclusion.

(2) *All irons are (some) metals;*
(1) *All metals are (some) minerals;*
*All irons are (some) minerals.*

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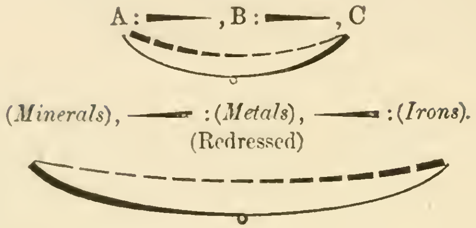
[1] [That fourth Figure differs from first only by transposition of Premises, — held by Derodon, *Logica Restituta*, p. 606. Camerarius, *Disputationes Philosophicæ*. Disp. i. qu. 13, p. 116. Caramuel, *Rat. et Real Phil.* Disp. xii. p. 45. Irenæus, *Integ. Phil.*, *Elementa Logices*, Sect. iii § 3, p. 29. Campanella, *Phil. Rat. Dialect.*, Lib. ii. c. vi. art. xi. p 391, and art. iv. p. 385 (1635). Ridiger, *De Sensu Veri et Falsi*, ii. 6, § 36. Crusius, *Weg Zur Gewissheit*, § 335, p. 606. Platner, *Philosophische Aphorismen*, i. § 554, p. 267.]

[2] But see Contarenus, *De Quarta Figura Syllog.*, *Opera*, p. 235. — Ed.

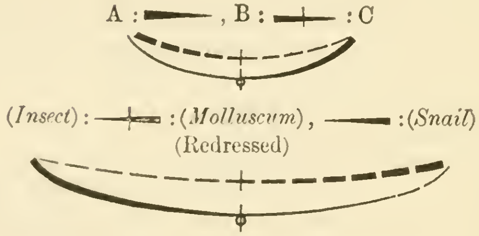
(By conversion.)

*Some minerals are (all) irons.*


A : ——, B : ——, C
(Minerals), —— : (Metals), —— : (Irons).
(Redressed)

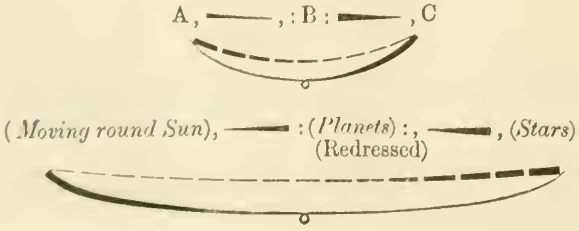
II. Calemes, — only Celarent with transposed premises and converted conclusion.

(2) *All snails are (some) mollusca;*
(1) *No molluscum is any insect;*
*No snail is any insect.*
(By conversion.)
*No insect is any snail.*


A : ——, B : —+— : C
(Insect) : —+— : (Molluscum), —— : (Snail)
(Redressed)

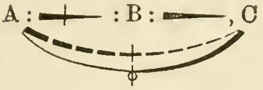
III. Dimatis, — only Darii with transposed premises and converted conclusion.

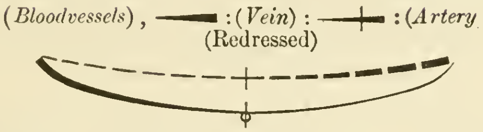
(2) *Some stars are (some or all) planets;*
(1) *All planets are some things moving round sun;*
*Some stars are some things moving round sun;*
(By conversion.)
*Some things moving round sun are some stars.*


A, ——, : B : ——, C
(Moving round Sun), —— : (Planets) :, ——, (Stars)
(Redressed)

IV. Fesapo [Felapos].[1]

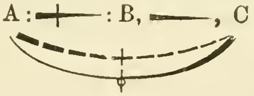
(2) *No artery is any vein;*
(1) *All veins are (some) bloodvessels;*
*No artery is (some) bloodvessel.*
(By conversion.)
*Some bloodvessel is no artery.*

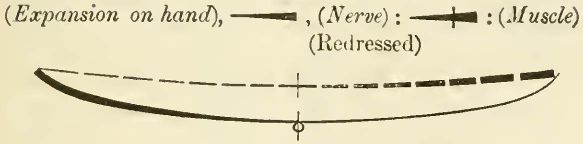




V. Fresison [Frelilos].

(2) *No muscle is any nerve;*
(1) *Some nerves are (some) expansion on hand;*
*No muscle is (some) expansion on hand.*
(By conversion.)
*Some expansion on hand is no muscle.*





(March 1846.) — My universal law of Figured Syllogism excludes the Fourth Figure. — *What worse relation of subject and predicate subsists between either of two terms and a common third term with which one, at least, is positively related; that relation subsists between the two terms themselves. What relation, etc.; that relation, etc.* Now, in Fourth Figure this is violated; for the predicate and subject notions, relative to the middle term in the premises, are in the conclusion turned severally into their opposites by relation to each other. This cannot, however, in fact be; and, in reality, there is a silently suppressed conclusion, from which there is only given the converse, but the conversion itself ignored.

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[1] Zabarella, *Opera Logica De Quarta Fig. Syll.* pp. 118, 119, 125. Burgersdyk, *Instit. Log.*, L. ii. c. 7, p. 167, reverses premises and reduces to Fapesmo an indirect mood of First; thus violating the rule of that Figure.

Fourth Figure. Reasons against.

1°, Could never directly, naturally, reach (a) Conclusion from premise, or (b) Premises from quæsitum.

2°, All other figures conversion of premises of First, but, by conversion of conclusion (as it is), no new figure.

3°, All other figures have one conclusion Fourth a converted one, often different.

(March 1850.) — Fourth Figure. The logicians who attempt to show the perversion in this figure, by speaking of higher and lower notions, are extralogical. Logic knows nothing of higher and lower out of its own terms; and any notion may be subject or predicate of any other by the restriction of its extension. Logic must show the perversion in this Figure *ex facie syllogismi*, or it must stand good. On true reason, why no Fourth Figure, see Aristotle, *Anal. Pr.*, L. i. c. 23, § 8, and Pacius, in *Commentary*.

(March 1850.) — *Fesapo* and *Fresiso* (also *Fapesmo*, *Frisesmo*) proceed on the immediate inference, unnoticed by logicians, that the quantities, apart from the terms, may, in propositions *InA* and *AnI*, be converted.

Averroes on *Prior Analytics*, B. i. Ch. 8.

"If we ask whether A be in C, and say that A is in C, because A is in B, and B in C: in this case, there is a natural syllogism by general confession; and this in the First Figure.

"In like manner, if we say that A is not in C, because B is in C, and B is not in A; it is plain that we collect that conclusion by natural process; and this is the Second Figure, which is frequently found employed by men in their ordinary discourse.

"In like manner, also, if we say that A is in C, because A and C are in B; that syllogism is also natural to us, and is the Third Figure. But if we say A is in C, because C is in B, and B in A; the reasoning is one which no one would naturally make, for the reason that the quæsitum (that is, C to be in A) does not hence follow — the process being that in which we say A is in C, since A is in B, and B in C; and this is something which thought would not perform, unless in opposition to nature. From this it is manifest that the Fourth Figure, of which Galen makes mention, is not a syllogism on which thought would naturally light" (etc.). Thereafter follows a digression against this figure. See also the same book, Ch. 23d, and the *Epitome*, by Averroes, of the same, Ch. i.

### (c) FOURTH FIGURE. — AUTHORITIES FOR AND AGAINST.

Admitted by —

Ildefonsus de Penafiel, *Cursus Philosophicus*, *Disp. Summul.* D. iii. p. 39. G. Camerarius, *Disput. Philos.*, P. i. q. xiii. p. 116. *Port Royal Logic*, p. iii. c. 8, and c. 4. Ridiger, *De Sensu Veri et Falsi*, L. ii. c. 6, § 36. Hauschius in *Acta Erud.* p. 470 *et seq.* Lips. 1728. Noldius, *Logica Recognita*, c. xii p. 277. Crakanthorpe, *Logica*, L. iii. c. xv. p. 194 (omitted, but defended). Lambert, *Neues Organon*, I. § 237 *et seq.* Hoffbauer, *Analytik der Urtheile und*

*Schlüsse*, § 138. Twesten, *Logik, insbesondere die Analytik*, § 110. Leibnitz. *Opera*, ii. 357 ; v. 405 ; vi. 216, 217, ed. Dutens. Oddus de Oddis (v. Contarenus, *Non Dari Quart. Fig. Syll.*, *Opera Omnia*, p. 233, ed. Venet, 1589).

Rejected by —

Averroes, *In An. Prior*, L. i. c. 8. Zabarella, *Opera Logica*, *De Quarta Fig. Syll.*, p. 102 *et seq.* Purchot, *Instit. Phil.* T. I. *Log.* P. iii. c. iii. p. 169. Molinæus, *Elementa Logica*, L. i. c. viii. Facciolati, *Rudimenta Logica*, P. iii. c. iii. p. 85. Scaynus, *Paraphrasis in Organ.*, p. 574. Timpler, *Logicæ Systema*, L. iv. c. i qu. 13, p. 543. Platner, *Philosophische Aphorismen*, I. p. 267. Burgersdicius, *Instit. Log.* L. ii. c. vii. p. 165. Derodon, *Logica Restituta*, p. 606. Wolf, *Phil. Rat.*, § 343 *et seq.* (Ignored.) Hollmann, *Logica*, § 453, p. 569. Goclenius, *Problemata Logica*, P. iv. p. 119. Keckermann, *Opera*, T. I. *Syst. Log.* Lib. iii. c. 4, p. 745. Arriaga, *Cursus Philosophicus, In Summulas*, D. iii. § 5, p. 24. Aristotle, *An. Prior*, i. c. 23, § 8 ; c. 30, § 1 (omitted). Jo. Picus Mirandulanus, *Conclusiones*, *Opera*, p. 88. Melanchthon, in 1st edition of *Dialectic*, L. iii., *De Figuratione* (1520), afterwards (1547) restored (Heumanni, *Acta*, iii. 753). Cardinalis Caspar Contarenus, *Epistola ad Oddum de Oddis*, *De Quart. Fig. Syll.*, *Opera*, p. 233 (1st ed., 1571) Trendelenburg, *Elementa Logica*, § 28, etc. Herbart, *Lehrbuch der Logik*, Einleit. 3, § 71. Hegel, *Encyclopædie*, § 187. Fries, *System der Logik*, § 57 b. Griepenkerl, *Lehrbuch der Logik*, § 29 *et seq.* Drobisch, *Logik*, § 77, p. 70. Wallis, *Institutio Logicæ*, L. iii. c. ix. p. 179.

### II. — INDIRECT MOODS OF SECOND AND THIRD FIGURES.[1]

| From | (II. Fig.) | |
|---|---|---|
| i. | Cesare | *Reflexim ;* (1, 2, 5, 8, 9.)[2] Cesares. |
| ii. | Camestres | *Reflexim ;* (2, 5, 8, 9.) Camestre, Camestres, Faresmo (only subaltern of Camestres); rejected (2), admitted (3, 6.) |
| iii. | Festino | Premises reversed; (2, 3, 4, 5, 6, 7, 8, 9.) Firesmo, Frigeros. |
| iv. | Baroco | Premises reversed; (2, 5, 7, 8, 9.) Bocardo, Moracos, Forameno. |
| | (III. Fig.) | |
| i. | Darapti | *Reflexim ;* (1, 2, 3, 4, 10, 11.) |
| ii. | Felapton | Premises transposed; (4, 5, 6, 7, 8, 9, 11.) Fapemo, Fapelmos. |
| iii. | Disamis | *Reflexim ;* (4, 7, 10, 11.) |
| iv. | Datisi | *Reflexim :* (4, 7, 10, 11.) |
| v. | Bocardo | Premises transposed; (4, 7, 9, 11.) Baroco, Macopos, Danorcoc. |
| vi. | Ferison | Premises transposed; (4, 5, 6, 7, 8, 9, 11.) Frisemo, Fiseros. |

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[1] The indirect Moods of the First Figure are universally admitted.

[2] The numbers within brackets refer to the authorities given on following page. — Ed.

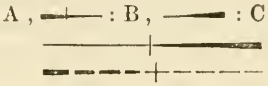
| | | |
|---|---|---|
| | (II. Fig.) | |
| 1. | Mart. Capella | Cesare, *reflexim.* |
| 2. | Duns Scotus | Cesare and Camestres, conclusions simply converted; Festino and Baroco. Rejects (and rightly) what has since been called Faresmo, as a mere subaltern of Camestres (*An. Pr.* L. i. qu. 23. See also Conimbricenses, *In Arist. Dial.* II. p. 362). |
| 3. | Lovanienses, (1535) | Faresmo, Firesmo. |
| 4. | Pacius, (1584) | Firesmo (on *An. Pr.* L. i. c. 7, and relative place of his *Com. Anal.*). |
| 5. | Conimbricenses | Record that indirect moods from Cesare and Camestres; and also Friseso, Bocardo were admitted by some "recentiores" (II. p. 362). |
| 6. | Burgersdicius, (1626) | Faresmo, Firesmo. |
| 7. | Caramuel, (1642) | Moracos, Frigesos. |
| 8. | Scheibler, (1653) | Cesares, Camestres, Firesmo, Bocardo. |
| 9. | Noldius, (1666) | Cesares, Camestre, Firesmo, Forameno (he has for the direct mood Facrono, in place of Baroco). |
| | (III. Fig.) | |
| 1. | Apuleius | Darapti, *reflexim.* |
| 2. | Cassiodorus | Do. |
| 3. | Isodorus | Do. |
| 4. | Duns Scotus | Darapti, Disamis, and Datisi, their conclusions simply converted; Felapton, Bocardo, Ferison (*Sup. An. Pr.* L. i. qu. 21). |
| 5. | Lovanienses | Fapemo, Frisemo (ib.). |
| 6. | Pacius | Fapemo, Frisemo (ib.). |
| 7. | Conimbricenses | Record that some "recentiores" admit indirect moods from Darapti, Disamis, Datisi; also Fapesmo, Frisesmo, and Baroco. |
| 8. | Burgersdicius | Fapemo, Frisemo. |
| 9. | Caramuel | Fapelmos, Macopos, Fiseros. |
| 10. | Scheibler | Admits them from Disamis, Datisi, Darapti, but not from those which conclude particular negations. |
| 11. | Noldius | Danorcoc (he has for Bocardo Docamroc), Frisemo, Fapemo, and what are converted from Darapti, Disamis, and Datisi without names. |
| | | Darapti virtually two moods; this maintained by Theophrastus. |

Indirect moods are impossible in the Second and Third Figures, for what are called indirect conclusions are only the direct conclusions. *Mem.*, that in the Second Cesare and Camestres are virtually one; while in the Third Figure Darapti is virtually two, as Disamis and Datisi are one.

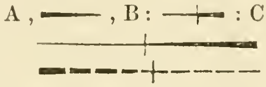
For the particular quantification of the Predicate, useful illustrations, as in the First from Fapesmo, Frisesmo, or (in the pseudo Fourth) from Fesapo and Fresiso; so in the Second Figure of what have been called the *indirect moods* of Figure II.

### FIGURE II.

1. Bocardo.

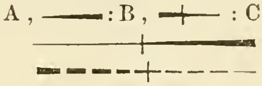


2. Firesmo.

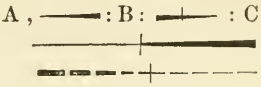


### FIGURE III.

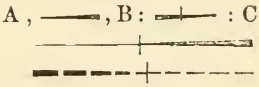
1. Baroco.



2. Fapemo.



3. Frisemo.



(1853.) Blunders of Logicians. — What have been called the Indirect Moods of the Second and Third Figures, arise only from the erroneously supposed transposition of the premises; and the Fourth Figure is made up of the really indirect moods of the First Figure, with the premises transposed.

### III. — NEW MOODS — NOTES UPON TABLE OF SYLLOGISMS.[1]

Fig. I. vi. — Corvinus (*Institutiones Philosophiæ Rationalis*, 1742, § 540) says: — "There sometimes appears to be an inference from pure particulars. For example, *Some learned are* [*some*] *ambitious men; some men are* [*all the*] *learned; therefore, some men are ambitious.* But the minor proposition, although formally particular, involves, however, a universal, to wit, its converse, — *All the learned are* [*some*] *men*, — which is equipollent." Why not, then, scientifically enounce (as I have done), without conversion, what the thought of the convertend already really and vulgarly involved?

In all Figures. — I have not been undoubtful whether the syllogisms of the class in which the two premises, being the same, are mutually interchangeable, should be regarded as a single or as a double mood. Abstractly considered from all matter, the mood is single; for the two premises, however arranged, afford only a repetition of the same form. But so soon as the form is applied to any matter, be it even of a symbolical abstraction, the distinction of a double mood emerges, in the possible interchange of the now two distinguished premises. To the logicians this question was only presented in the case of Darapti (III. ii.) ; and on this they were divided. Aristotle (*An. Pr.* i. c. 6, § 6) contemplates only one mood ; but his successor, Theophrastus, admitted two (Apuleius, *De Hab. Doctr. Platonis*, L. iii. *Op.* p. 38, Elm). Aristotle's opinion was overtly preferred by Alexander (*ad locum*, f. 30, ed. Ald. quoted above, p. 636), and by Apuleius (*l. c.*) ; whilst that of Theophrastus was adopted by Porphyry, in his lost commentary on the *Prior Analytics*, and, though not without hesitation, by Boethius (*De Syll. Categ.* L. ii., *Op.* pp. 594, 598, 601, 604). The other Greek and Roman logicians silently follow the master: from whom, in more modern times, Valla (to say nothing of others) only differs, to reduce, on the counter-extreme, Cesare and Camestres (II. ix. a, and x. b), and, he might have added, Disamis and Datisi (III. iv. v.), to a single mood (*De Dial.*, L. ii. c. 51). (For the observations of the Aphrodisian, see above, p. 633 *et seq.*)

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[1] See Appendix XI. — ED.

To me it appears, on reflection, right to allow in Darapti only a single mood ; because a second, simply arising through a first, and through a transposition, has, therefore, merely a secondary, correlative, and dependent existence. In this respect all is different with Cesare and Camestres, Disamis, and Datisi. The principle here applies in my doctrine to the whole class of syllogisms with balanced middle and extremes.

Fig. II. xii. b. — David Derodon (*Log. Rest. De Arg.*, c. ii. § 51), in canvassing the special rule of the Second Figure, — that the major premise should be universal, — he now approbates, he now reprobates syllogisms of this mood ; but wrong on both alternatives, for his admissions and rejections are equally erroneous. "Hic syllogismus non valet : — *Aliquod animal est [aliquod] rationale : sed [ullus] asinus non est [ullus] rationalis ; ergo [ullus] asinus non est [aliquod] animal.*" (P. 635.) The syllogism is valid ; only it involves a principle which Derodon, with the logicians, would not allow, — that in negatives the predicate could be particular. — (See *Log. Rest. De Argument*, c. ii. § 28, p. 623.) Yet almost immediately thereafter, in assailing the rule, he says : — "At multi dantur syllogismi constantes majori particulari, qui tamen sunt recti ; ut, — *Aliquod animal non est [ullus] lapis ; sed [omnis] adamas est [aliquis] lapis ; ergo, [ullus] adamas non est [aliquod] animal.*" (This syllogism is, indeed, II. iii. a ; but he goes on :) "Item : *Aliquod animal est [aliquod] rationale ; sed [ullus] lapis non est [ullus] rationalis ; ergo [ullus] lapis non est [aliquod] animal.*" Now, these two syllogisms are both bad, as inferring what Derodon thinks they do infer, — a negative conclusion, with, of course, a distributed predicate (p. 623) ; are both good, as inferring what I suppose them to infer, — a negative conclusion with an undistributed predicate.

Fig. III. viii. b. — Derodon (*Ibid.* § 54), in considering the Special Rule of the Third Figure, — that the minor premise should be affirmative, — alleges the following syllogism as "*vicious :*" — "*Omnis homo est [aliquod] animal ; sed [ullus] homo non est [ullus] asinus ; ergo, [ullus] asinus non est [aliquod]* *animal*" (p. 638). It is a virtuous syllogism, — with a particular predicate (and not a universal, as one logician imagines) in a negative conclusion. Again (omitting his reasoning, which is inept), he proceeds: — "Hic vero syllogismus non est vitiosus, sed rectus: — [*Omnis*] *homo est* [*quidam*] *rationalis, sed* [*ullus*] *homo non est* [*ullus*] *asinus* [or *Deus*]; *ergo*, [*ullus*] *asinus* [or *Deus*] *non est* [*quidam*] *rationalis*." This syllogism is indeed correct; but not as Derodon would have it, with a distributed predicate in the conclusion. That his conclusion is only true of the *asinus*, per accidens, is shown by the substitution of the term *Deus*; this showing his illation to be formally absurd.

Fig. III. ii. — Derodon (*Ibid.*) says: — "Denique, conclusionem in tertia figura debere esse particularem, non universalem, statuunt communiter Philosophi; unde hic syllogismus non valet; — '*Omnis homo est* [*quidam*] *rationalis; sed omnis homo est* [*quoddam*] *animal; ergo, omne* [*quoddam*] *animal est* [*quoddam*] *rationale*.' Verum, licet conclusio sit *universalis*, syllogismus erit bonus, modo," etc. (p. 638). The syllogism is, and must remain, vicious, if the subject and predicate of the conclusion be taken universally, whilst both are undistributed in the antecedent. But if taken, as they ought to be, in the conclusion particularly, the syllogism is good. Derodon, in his remarks, partly overlooks, partly mistakes, the vice.

Derodon, criticizing the Special Rule of the First Figure, — that the major premise should be universal, — says, inter alia: — "At multi dantur syllogismi primæ figuræ constantes majori particulari, qui tamen sunt recti: ut, — '*Aliquod animal est* [*aliquod*] *rationale; sed homo est* [*aliquod*] *animal; ergo*, [!!] *homo est* [*aliquis*] *rationalis*': item," etc., etc. (p. 627). This syllogism is vicious; the middle term, *animal*, being particular in both its quantifications, affords no inference.[1]

# XI.

## LOGICAL NOTATION.

(See p. 215.)

### I. — Lambert's Linear Notation.[2]

This very defective, — indeed, almost as bad as possible. It has accordingly remained unemployed by subsequent logicians; and although I think linear diagrams do afford the best geometrical illustration of logical forms, I have found it necessary to adopt a method opposite to Lambert's, in all that is peculiar to him. I have been unable to adopt, unable to improve, anything.

1°. Indefinite or particular notions can only be represented by the relation of two lines, and in two ways: 1°, One being greater than the other; 2°, One being partially out of relation to the other. Instead of this, Lambert professes to paint particularity by a dotted line, *i. e.*, a line different by an accidental quality, not by an essential relation. But not even to this can he adhere, for the same notion, the same line, in different relations, is at once universal and particular. Accordingly, in Lambert's notation, the relation of particular notions is represented sometimes by a continuous, sometimes by a dotted line, or not represented at all. (See below, 1*, 1, 2, 3, 4, 5.)

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[1] See p. 559. — Ed.

[2] For Lambert's scheme of notation, see his *Neues Organon*, I. § 21; and for a criticism of the schemes of Lambert and Euler, see S. Maimon. *Versuch einer neuen Logik*, Sect. iv., § 7, p. 64 *et seq.* Berlin, 1794. — Ed.

2°. The inconsistency is seen at all climax in the case of the predicate in affirmatives, where that term is particular. In Lambert's notation it, however, shows in general as distributed or universal; but in this he has no constancy. (See 1*, 1, 2, 3, 4) But the case is even more absurd in negative propositions, where the predicate is really taken in its whole extent, and yet is, by the dotted line, determinately marked as particular (See 4.)

3°, The relation of negativity, or exclusion, is professedly represented by Lambert in one line beyond, or at the side of, another. This requires room, and is clumsy, but is not positively erroneous: — it does express exclusion. But his affirmative propositions are denoted by two unconnected lines, one below the other. This is positively wrong; for here the notions are equally out of the other, as in the lateral collocation. But even in this he is inconsistent; for he as often expresses the relation of negativity by lines in the relation of higher and lower. (See below, 1, 4.)

4°. He attempts to indicate the essential relation of the lines by the fortuitous annexation of letters, the mystery of which I have never fathomed.

5°. He has no order in the relation of his lines.

The middle term is not always the middle line, and there is no order between the extremes.

This could not indeed be from his method of notation; and except it be explained by the affixed letters, no one could discover in his lines the three compared notions in a syllogism, or guess at the conclusion inferred. (See 1—5.)

6°, From poverty the same diagram is employed to denote the most different moods in affirmative and negative. (Compare 2 and 3 with 4.)

7°, No order in the terms in the same figure.

8°, Incomplete. Lambert can represent ultra-total, etc., included in affirmative, but not ultra-total excluded in negative. Has the merit of noticing this relation.

9°, Lambert — but it is needless to proceed. What has been already said, shows that Lambert's scheme of linear notation is, in its parts, a failure, being only a corruption of the good, and a blundering and incongruous jumble of the natural and conventional. The only marvel is, how so able a mathematician should have propounded two such worthless mathematical methods. But Lambert's geometrical is worse even than algebraic notation.

To vindicate what I have said, it will be enough to quote his notation of the *moods* of the Third Figure (I. p. 133), which I shall number for the previous references.

### III. Figure.

1.* Darapti. . . . . C— — — c . . . .
M — — m
. . . . B— — — b . . . .

1. Felapton. M — — m C — — c
B— — — b . . . . . .

2. Disamis. B— — — — b
M — — — m
. . . C . . . . . . . . .

3. Datisi. C— — — — c
M — — — m
. . B . . . . . . . .

4. Bocardo. B— — — — — b
M — — — m
C . . . . . . . . . . . .

5. Ferison. M— — m C — — c
. . B . . . . . . . . . .

## II. — Notation by Maass.

Professor Maass, of Halle,[1] discontented, not unreasonably, with the geometrical notations of Lambert and Euler, has himself proposed another, compared with which those of his predecessors show as absolutely perfect. It will be sufficient to despatch this scheme with a very few remarks. To use it is wholly impossible; and even the ingenious author himself has stated it towards the conclusion of his *Logic* (§§ 495—512), in the course of which it is not (if I recollect aright) honored with a single reference. It is, however, curious, as the only attempt made to illustrate Logic, not by the relations of geometrical quantities, but by the relations of geometrical relations — angles.

1°, It is fundamentally wrong in principle. For example, Maass proposes to represent coïnclusive notions — notions, therefore, to be thought as the same — by the angles of a triangle, which cannot possibly be imaged as united; for surely the identity of the concepts, *triangle*, *trilateral*, and *figure with angles equal to two right angles*, is not illumined by awarding each to a separate corner of the figure. On the contrary, coëxclusive notions he represents by angles in similar triangles, and these can easily be conceived as superposed. The same may be said of coördinates. But, waiving the objection that the different angles of a figure, as necessarily thought out of each other, are incapable of typifying, by their coincidence, notions to be thought as coïnclusive, — it is further evident that the angles of an equilateral triangle cannot naturally denote reciprocal or wholly identical notions, in contrast to others partially identical; for every angle of every triangle infers, — necessitates, — contains, if you will, — the whole of every other, equally as do the several angles of an equilateral triangle.

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[1] *Grundriss der Logik*, 1793 I quote from the fourth edition, 1823. I regret the necessity imposed on me of speaking in the way I do of Maass' scheme of notation; for his *Logic* is one of the best compends published even in Germany.

2°, But Maass is not consistent. He gives, for instance, a triangle (Fig. 12) to illustrate the subordination of one notion to another; and yet he represents the lower or contained notion by an obtuser, the higher or containing notion by an acuter, angle.

3°. The scheme is unmanifest, — in fact. nothing can be less obtrusive. It illustrates the obscure by the obscure, or, rather, it obscures the clear. Requiring itself a painful study to comprehend its import (if comprehended it be), instead of informing the understanding through the eye, it at best only addresses the eye through the understanding. Difficult; — we only regret that it had not been impossible.

4°, It is clumsy, operose, complex, and superfluous. For, to represent a notion denoted by a single angle, it is compelled to give the redundance of a whole triangle; and three repugnant notions demand an apparatus of three several figures, and six vacant angles. In fact, the only manifestation to which this scheme of angles can pretend, is borrowed from the scheme of figures which it proposes to supersede.

5°, It is wholly dependent upon the accidents of foreign aid. To let it work at all, it calls in to its assistance an indefinite plurality of figures, a Greek and Latin alphabet, combinations of letters straight and deflected, and an assortment of lines, thick and thin, plain and dotted. I have counted one diagram of the eighteen, and find that it is brought to bear through three varieties of line, four triangles, and eleven letters.

It is needless to enumerate its other faults, its deficiencies, excesses, ambiguities, etc.; *transeat in pace.*

## III. — The Author's Notation.

### NO. I. LINEAR

The notation previously spoken of[1] represents every various syllogism in all the accidents of its external form. But as the number of Moods in Syllogisms Analytic and Synthetic, Intensive and Extensive, Unfigured and Figured (and of this in all the figures), are the same; and as a reasoning, essentially identical, may be carried through the same numerical mood, in every genus and species of syllogism, it seems, as we should wish it, that there must be possible, also, a notation precisely manifesting the modal process, in all its essential differences, but, at the same time, in its internal identity, abstract from every accidental variety of external form. The anticipation and wish are realized, and realized with the utmost clearness and simplicity, in a notation which fulfils, and alone fulfils, these conditions. This notation I have long employed; and the two following are specimens. Herein, four common lines are all the requisites: three (horizontal) to denote the *terms;* one (two? — perpendicular), or the want of it, at the commencement of comparison, to express the *quality* of affirmation or of negation; whilst *quantity* is marked by the relative length of a terminal line within, and its indefinite excurrence before, the limit of comparison. This notation can represent equally *total* and *ultra-total* distribution, in simple Syllogism and in Sorites; it shows at a glance the *competence* or *incompetence* of any conclusion; and every one can easily evolve it.

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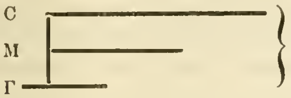
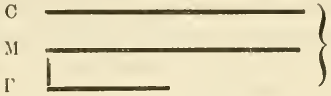
[1] See Tabular Scheme at the end of the present volume. — Ed.





Of these, the former, with its converse, includes Darii, Dabitis, Datisi, Disamis, Dimaris, etc.; whilst the latter, with its converse, includes Celarent, Cesare, Celanes, Camestres, Cameles, etc. But of these, those which are represented by the same diagram are, though in different figures, formally the same mood. For in this scheme, moods of the thirty-six each has its peculiar diagram; whereas, in all the other geometrical schemes hitherto proposed (whether by lines, angles, triangles, squares, parallelograms, or circles), the same (complex) diagram is necessarily employed to represent an indefinite plurality of moods. These schemes thus tend rather to complicate than to explicate, — rather to darken than to clear up. The principle of this notation may be realized in various forms.[1]

The problem, in general, is to manifest, by the differences and relations of geometrical quantities (lines or figures), the differences and relations of logical forms. The comparative excellence of any scheme in solution of this problem will be in proportion as it is, 1°, Easy: 2°, Simple; 3°, Compendious; 4°, All-sufficient; 5°, Consistent; 6°, Manifest; 7°, Precise; 8°, Complete.

In the scheme proposed by me,

1°, I denote terms or notions by straight lines; and, as a syllogism is constituted by three related notions, it will, of course, be represented by three related lines.

2°, I indicate the correlation of notions by the order and parallel coëxtension of lines. (The perpendicular order and horizontal extension, here adopted, is arbitrary.)

3°, Lines, like notions, are only immediately related to those with which they stand in proximity. Hence the intermediate line in our diagram, representing the middle term of a syllogism, is in direct relation with the lines representing the extremes, whereas the latter are only in mutual correlation through it.

4°, The relative quantity of notions is expressed by the comparative length of the related lines. In so far as a line commences (here on the left) before another, it is out of relation with it, — is indefinite and unknown. Where a line terminates under relation (here towards the right), it ceases absolutely to be. A line beginning and ending in relation indicates a whole notion. A line beginning before or ending after its correlative indicates a part of a notion.

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[1] Reprinted from *Discussions*, p. 657. For a further explanation of the relations denoted by the diagrams, see p. 134. — Ed.

5°. The kinds of correlation, Affirmation and Negation, are shown by the connection or non-connection of the lines (here from the left). The connection (here a perpendicular line) indicates the identity or coïnclusion of the connected terms: the absence of this denotes the opposite. The lines in positive or affirmative relation are supposed capable of being slid into each other.

This geometric scheme seems to recommend itself by all the virtues of such a representation, and thus stands favorably contrasted with any other. For it is easy, — simple, — compendious, — all-sufficient, — consistent, — manifest, — precise, — complete.

1°. Easy. — Linear diagrams are more easily and rapidly drawn than those of figure; and the lines in this scheme require, in fact, no symbols at all to mark the terminal differences, far less the double letterings found necessary by Lambert.

2°, Simple. — Lines denote the quantity and correlation of notions far more simply than do any geometric figures. In those there is nothing redundant; all is significant.

3°. Compendious. — In this respect lines, as is evident, are far preferable to figures; but Lambert's linear scheme requires more than double the space sufficient for that here proposed.

4°, All-sufficient. — Any scheme by figures, and Lambert's scheme by lines, is, in itself, unintelligible, and depends on the annexation of accidental symbols to enable it to mark out the differences and relations of terms. Lambert, likewise, endeavors to supply this exigency by another means, — by the fortuitous quality (his dottings) of certain lines. In our scheme lines, simple lines, and lines alone, are sufficient.

5°, Consistent. — Lambert's linear scheme is a mere jumble of inconsistencies. Compared with his, those by figures are, in this respect, far preferable. But the present linear scheme is at once thorough-going, unambiguous, and consistent.

6°, Manifest. — In this essential condition, all other geometrical illustrations are lamentably defective. In those by figure, each threefold diagram, typifying an indefinite plurality of moods, requires a painful consideration to extract out of it any pertinent elucidation; this is, in fact, only brought to bear by the foreign aid of contingent symbols. Nor can these schemes properly represent to the eye the relation of the toto-total identity of a plurality of terms; the intention requires to be intimated by the external accident of signs. Lambert's lines sink, in general, even below the figures, in this respect. But as lines are here applied, the sole pertinent inference leaps at once to sense and understanding.

7°. Precise. — Ambiguity, vagueness, vacillation, redundancy, and, withal, inadequacy, prevail in the other schemes. In those by figure, one diagram is illustrative of as many as a dozen moods, positive and negative; and a single mood may fall to be represented by four diagrams, and perhaps in six several ways. Lambert's lines are even worse. In our scheme, on the contrary, every mood has a diagram applicable to itself, and to itself exclusively, whilst every possible variety of its import has a corresponding possible variety of linear difference.

8°, Complete. — In this last and all-important condition, every scheme hitherto proposed is found to fail. A thorough-going, adequate, and pliant geometric method ought equally and at once to represent the logical moods in the Unfigured and Figured Syllogism, in the Syllogism Synthetic and Analytic, in Extension and Intension, — this, too, in all their mutual convertibilities, and in all their individual varieties. This our scheme performs, but exclusively. So much in general. Again, in particular: — Of the figures, circles and triangles are necessarily inept to represent the ultra-total inclusion or coëxclusion of terms, — in a word, all the relations of proportion, except totality and indefinite partiality; whilst quadrilateral figures are, if not wholly incompetent to this, operose and clumsy. Lambert's linear method is incompetent to it in negatives; and such inability ought to have opened his eyes upon the defects of the whole plan, for this was a scheme which he expressly proposed to accomplish. The present scheme, on the other hand, simply and easily affirms this, in affirmation and negation, and with any minuteness of detail.

### AUTHOR'S SCHEME OF NOTATION — UNFIGURED AND FIGURED SYLLOGISM — NO. II.

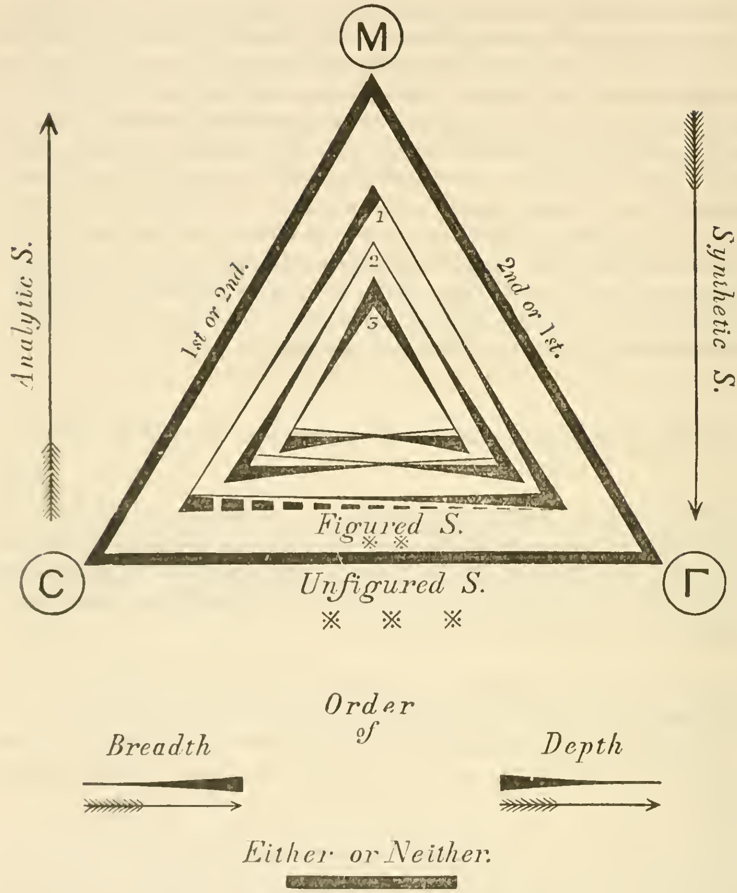
(1853.) The following Diagram (see p. 674) affords a condensed view of my other scheme of Syllogistic Notation, fragments of which, in detail, will be found in Mr. Thomson's *Outline of the Laws of Thought*, and in Mr. Baynes' *Essay on the New Analytic of Logical Forms.* The paragraphs appended will supply the necessary explanations.

1.) A Proposition (*διάστημα, intervallum, πρότασις*, literally *protensio*, the stretching out of a line from point to point) is a mutual relation of two terms (*ὅροι*) or extremes (*ἄκρα*). This is therefore well represented, — The two terms, by two letters, and their relation, by a line extended between them.

2.) A Syllogism is a complexus of Three Terms in Three Propositions. — It is, therefore, adequately typified by a Triangle, — by a Figure of three lines or sides.

3.) As upwards and downwards is a procedure arbitrary in the diagram, the diagram indicates that we can, indifferently, either proceed from the Premises *(rationes)* to the Conclusion *(rationatum)*, or from the Conclusion to the Premises; the process being only, in different points of view, either Synthetic or Analytic. (An exclusive and one-sided view, be it remembered, has given an inadequate name to what are called Premises and Conclusion.)

4.) Rationally and historically, there is no ground for constituting that Premise into Major which is enounced *first*, or that Premise into Minor which is enounced *last*. (See after, p. 697, etc.) The moods of what is called the Fourth Figure, and the Indirect moods of the First Figure, are thus identified. In the diagram, accordingly, it is shown, that as right or left in the order of position is only accidental, so is first or last in the order of expression.


M
C
Γ
Analytic S.
Synthetic S.
1st or 2nd.
2nd or 1st.
1
2
3
Figured S.
※ ※
Unfigured S.
※ ※ ※
Order of
Breadth
Depth
Either or Neither.

5.) The diagram truly represents, by its various concentric triangles, the Unfigured Syllogism, as involving the Figured, and, of the latter, the First Figure as involving the two others. (In fact, the whole differences of Figure and Figures are accidental: Moods alone are essential, and in any Figure and in none, these are always the same and the same in number.)

6.) Depth and Breadth, Subject and Predicate, are denoted by the thick and thin ends of the same propositional line.

7.) Depth and Breadth are quantities always coëxistent, always correlative, each being always in the inverse ratio of the other. This is well shown in the connection and contrast of a line gradually diminishing or increasing in thickness from end to end.

8.) But though always coëxistent, and consequently always, to some amount, potentially inferring each other, still we cannot, without the intervention of an actual inference, at once jump from the one quantity to the other, — change, *per saltum*, Predicate into Subject, and Subject into Predicate. We must proceed *gradatim.* We cannot arbitrarily commute the quantities, in passing from the Quæsitum to the Premises, or in our transition from the Premises to the Conclusion. When this is apparently done (as in the Indirect moods of the First Figure and in all the moods of the Fourth), the procedure is not only unnatural, but virtually complex and mediate; *the mediacy being concealed by the concealment of the mental inference which really precedes.* Indicated by the line and broken line for the First Figure.

9.) In Syllogism, Figure and the varieties of Figure are determined by the counter relations of Subject and Predicate subsisting between the syllogistic terms, — between the Middle and Extremes. All adequately represented.

10.) Figure and the differences of Figures all depending upon the difference of the mutual contrast of Subject and Predicate between the syllogistic terms: consequently, if this relation be abolished, — if these terms be made all Subjects (or it may be all Predicates), the distinction of Figure will be abolished also. (We do not abolish, be it noted, the Syllogism, but we recall it to one simple form.) — And this is represented in the diagram. For as the opposition of Subject and Predicate, of Depth and Breadth, is shown in the opposition of the thick and thin ends of the same tapering line; so where (as in the outmost triangle) the propositional lines are of uniform breadth, it is hereby shown that all such opposition is sublated.

11.) It is manifest that, as we consider the Predicate or the Subject, the Breadth or the Depth, as principal, will the one premise of the Syllogism or the other be Major or Minor; the Major Premise in the one quantity being Minor Premise in the other. Shown out in the diagram.

12.) But as the First Figure is that alone in which there is such a difference of relation between the Syllogistic Terms, — between the Middle and Extreme, so in it alone is such a distinction between the Syllogistic Propositions realized. By the diagram this is made apparent to the eye.

13.) In the Unfigured Syllogism, and in the Second and Third Figures, there is no difference between the Major and Minor Terms, and, consequently, no distinction (more than one arbitrary and accidental) of Major and Minor Propositions. All conspicuously typified.

14.) All Figured Syllogisms have a Double Conclusion, but in the different figures in a different way. This is well represented.

15.) The Double Conclusions, both equally direct, in the Second and Third Figures, are shown in the crossing of two counter and corresponding lines.

The logicians are at fault in allowing Indirect Conclusions in these two figures, — nor is Aristotle an exception. (See *Pr. An.*, I. vii. § 4.)

16.) The Direct and Indirect Conclusions in the First Figure are distinctly typified by a common and by a broken line; the broken line is placed immediately under the other, and may thus indicate that it represents only a reflex of, — a consequence through the other (*κατ' ἀνάκλασιν*, *reflexim*, *per reflexionem*). The diagram, therefore, can show that the Indirect moods of the First Figure, as well as all the moods of the Fourth, ought to be reduced to merely *mediate* inferences; that is, to conclusions from conclusions of the conjugations or premises of the First Figure.[1]

[The following Table affords a view in detail of the Author's Scheme of Syllogistic Notation, and of the valid Syllogistic Moods (in Figure), on his doctrine of a quantified Predicate. In each Figure (three only being allowed) there are 12 Affirmative and 24 Negative moods; in all 36 moods. The Table exhibits in detail the 12 Affirmative Moods of each Figure, and the 24 Negative Moods of the First Figure, with the appropriate notation.

The letters C, Γ, each the third letter in its respective alphabet, denote the extremes; the letter M denotes the middle term of the syllogism. Definite quantity *(all, any)* is indicated by the sign (:); indefinite quantity *(some)* by the sign (, or .). The horizontal tapering line (━━─) indicates an affirmative relation between the subject and predicate of the proposition. Negation is marked by a perpendicular line crossing the horizontal (━┼─). The negative syllogisms, in all the Figures, are exactly double the number of the affirmative; for every affirmative affords a double negative, as each of its premises may be marked by a negative. In Extension, the broad end of the line denotes the subject, the pointed end the predicate. In Comprehension this is reversed; the pointed end indicating the subject, the broad end the predicate. By the present scheme of notation, we are thus able to read a syllogism both in Extension and in Comprehension. The line beneath the three terms denotes the relation of the extremes of the conclusion. Predesignation of the conclusion is marked only when its terms obtain a different quantity from what they hold in the premises. Accordingly, when not marked, the quantification of the premises is held repeated in the conclusion. In the Second and Third Figures, — a line is inserted above as well as below the terms of the syllogism, to express the double conclusion in those figures. The symbol ⌣ ⌢ shows that when the premises are converted, the syllogism remains in the same mood; >< shows that the two moods between which it stands are convertible into each other by conversion of their premises. The middle term is said to be *Balanced*, when it is taken definitely in both premises. The extremes are balanced, when both are taken definitely; unbalanced, when the one is definite, and the other is not.

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[1] Reprinted from *Discussions*, pp. 657—661. — Ed.

The Table here given exhibits the author's final arrangement of the Syllogistic Moods. The Moods are either A), *Balanced*, or B), *Unbalanced*. In the former class both Terms and Propositions are Balanced, and it contains two moods, — i.; ii. In the latter class there are two subdivisions. For either, a), the Terms are Unbalanced, — iii. iv.; or, b), both the Terms and Propositions are Unbalanced, — v. vi.; vii. viii.; ix. x.; xi. xii.

It should be observed that the arrangement of the order of Moods given in the present Table differs from that of the earlier scheme printed above, p. 537 *et seq.* The following is the correspondence in the order of moods:

| Present and Final Table. | | | Earlier Table. |
|---|---|---|---|
| I. | corresponds | to | I. |
| II. | " | " | II. |
| III. | " | " | XI. |
| IV. | " | " | XII. |
| V. | " | " | VII. |
| VI. | " | " | VIII. |
| VII. | " | " | III. |
| VIII. | " | " | IV. |
| IX. | " | " | V. |
| X. | " | " | VI. |
| XI. | " | " | IX. |
| XII. | " | " | X. |

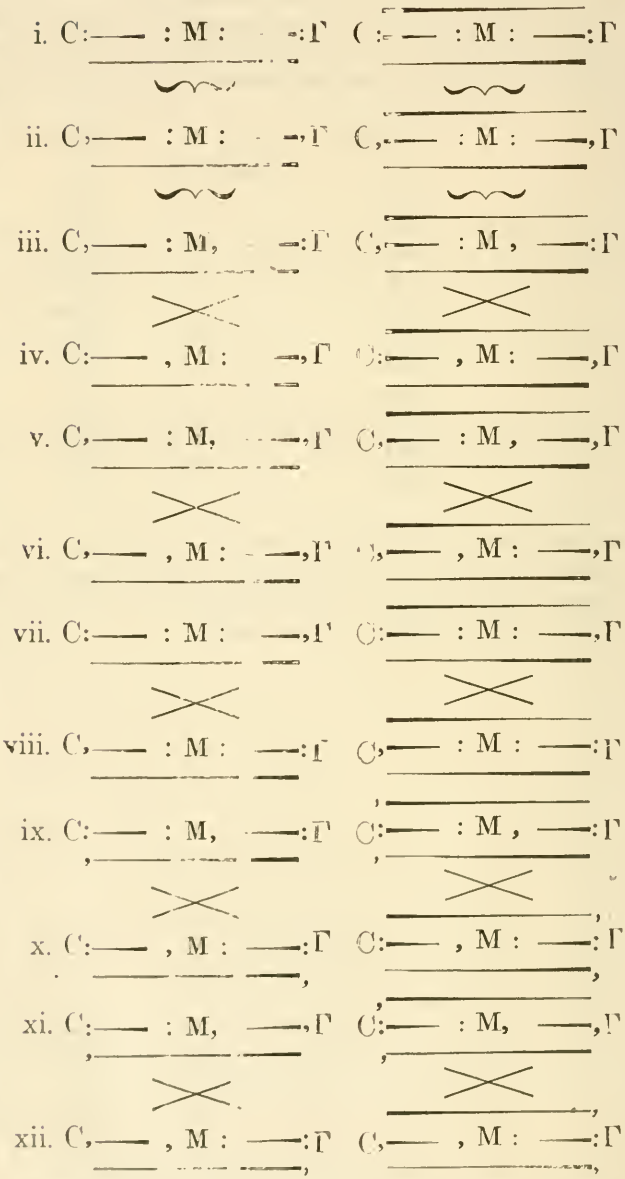
The order of the earlier Table is that given by Mr. Baynes, in the scheme of notation printed at p. 76 of his *Essay on the New Analytic*. The order of the present Table corresponds with that given by Dr. Thomson in his *Laws of Thought*, p. 244, 3d edition, 1853. — Ed.]

## SCHEME OF NOTATION—

## TABLE OF SYLLO·

A. AFFIRMATIVE MOODS

FIG. I FIG. II.


i. C: —— : M : ——:Γ C: —— : M : ——:Γ
ii. C, —— : M : ——,Γ C, —— : M : ——,Γ
iii. C, —— : M, ——:Γ C, —— : M , ——:Γ
iv. C: —— , M : ——,Γ C: —— , M : ——,Γ
v. C, —— : M, ——,Γ C, —— : M , ——,Γ
vi. C, —— , M : ——,Γ C, —— , M : ——,Γ
vii. C: —— : M : ——,Γ C: —— : M : ——,Γ
viii. C, —— : M : ——:Γ C, —— : M : ——:Γ
ix. C: —— : M, ——:Γ C: —— : M , ——:Γ
x. C: —— , M : ——:Γ C: —— , M : ——:Γ
xi. C: —— : M, ——,Γ C: —— : M, ——,Γ
xii. C, —— , M : ——:Γ C, —— , M : ——:Γ

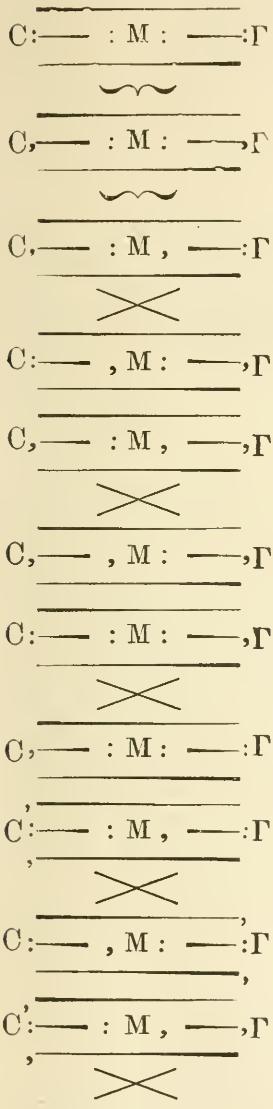
NOTE.—A. i. and ii. are *Balanced*. B. The other moods are *Unbalanced*. Of these,

# FIGURED SYLLOGISM.

## GISTIC MOODS.

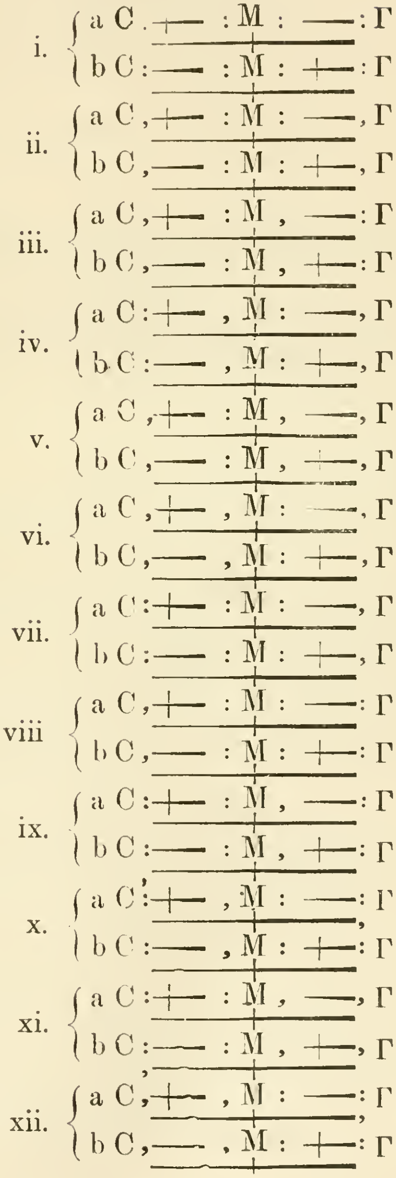
### A. AFFIRMATIVE MOODS.

FIG. III.



### B. NEGATIVE MOODS.

FIG. I.


i.
ii.
iii.
iv.
v.
vi.
vii.
viii
ix.
x.
xi.
xii.
a C
b C
M
Γ

iii. and iv. are unbalanced in terms only, not in propositions; the rest in both.

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