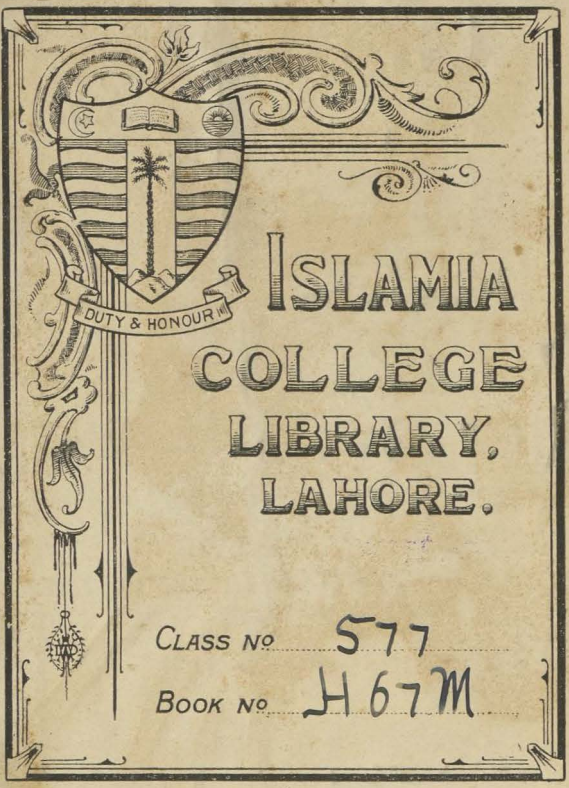
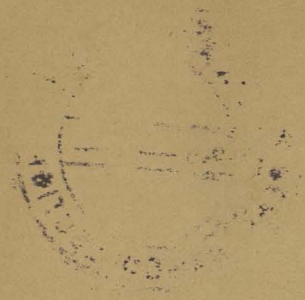
MATTER · LIFE · MIND
AND · GOD
R · H · A · E · D · H · O · E · R · N · L · É



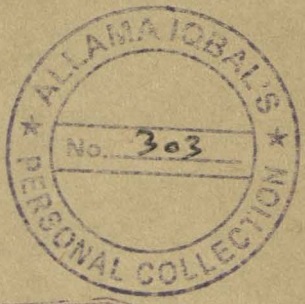
6/

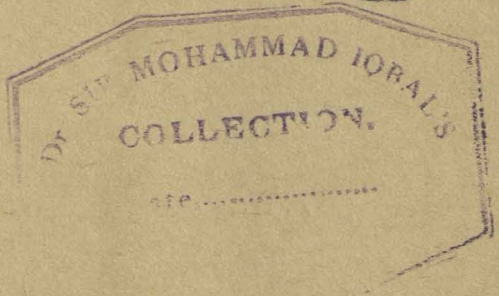
2/83

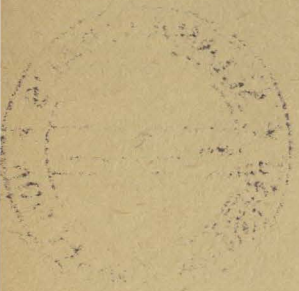
M.A. SECTION



MATTER, LIFE, MIND, AND GOD







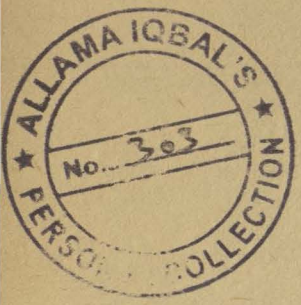
MATTER, LIFE, MIND, AND GOD

FIVE LECTURES ON CONTEMPORARY TENDENCIES OF THOUGHT

BY

R. F. ALFRED HOERNLÉ
M.A., B.Sc. (Oxon.)
PROFESSOR OF PHILOSOPHY, ARMSTRONG COLLEGE
(NEWCASTLE-UPON-TYNE) IN THE UNIVERSITY OF DURHAM

METHUEN & CO. LTD.
36 ESSEX STREET W.C.
LONDON

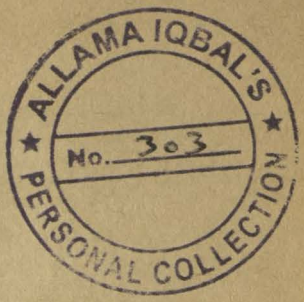


First Published in 1923

PRINTED IN GREAT BRITAIN

IN MEMORIAM

JOANNIS THEODORI MERZ



PREFACE

MATTER, LIFE, MIND, AND GOD may well seem too big a title for so small a book. And, truly, if it were taken to imply a claim to exhaustive treatment of the topics it names, it would bespeak inexcusable presumption on the author's part. No, it is meant as nothing more than a handy abbreviation for some such phrase as this: "A discussion of what some of the leading thinkers of our day are saying about 'Matter, Life, Mind, and God.'" This, and no more, is all this little volume of lectures attempts.

The original lectures were inspired by the thought that a University placed, like Armstrong College, in a centre of business and industry, owes a duty not only to its enrolled students, but to the whole community of which it forms a part: that it should strive, in fact, to be the focus of the intellectual life of its neighbourhood. For, the days when education was treated as the special prerogative of the well-to-do have passed away. In principle, no one now disputes that all should have access to education

in the measure of their interest and capacity. Moreover, the many vigorous movements for Adult Education which have sprung up of recent years bear eloquent witness to the truth that the desire for knowledge lasts as long as life itself. This new spirit is altering profoundly the outlook of the academic teacher. He is learning that he owes it to his subject, to his University, to his city and district, to help all who desire to keep in touch, not only with new discoveries and theories in every field of research, but especially with those larger movements of thought, in science, in philosophy, in religion, which lie behind the visible scene and make or unmake our civilization.

The lectures, then, which compose this small volume are offered as a contribution to the realization of this ideal. They are not intended for professors and experts. The audiences which listened to them were composed mainly of men and women without any special training in philosophy. But they brought to the hearing, together with a common background of general education, a keen desire to understand whither the reflections of leading thinkers of the day are tending on such persistent problems as Matter and Life, Mind and God. To meet this demand, so far as lay in my power, was my aim. By this aim I would ask that the lectures be judged, now that,

through the medium of print, they are laid before a wider public.

The lectures were originally spoken freely from a few notes and written out later, after an interval occasioned by other claims upon my time. In consequence, the written lectures differ, both by omission and by addition, from the spoken ones. Moreover, freed in writing from the time-limits imposed on a speaker, I have re-arranged into five printed lectures what occupied six lectures in delivery. But the substance and the general plan have remained the same.

The plan, or pervading interest, which runs through the lectures is to review some of the chief movements in contemporary thought, in order to see whether, in spite of their manifest diversity and even their conflict, they do not exhibit traces, at least, of a coherent pattern ; whether they do not hold out the promise and possibility of unity in our spiritual life—a unity no less of thought than of feeling. The precise nature of this *synoptic* problem is set forth in the first lecture, which describes the profound and many-sided influence of Science on modern Thought, and then goes on to exhibit the limitations of the scientific concept of " Nature " as compared with the whole " Universe " of human experience. The second lecture gives an account of the revolt against " materialism " in the Philosophy

of Nature, of which A. N. Whitehead is the brilliant leader—a revolt, however, the success of which has been prepared by many forerunners, both among philosophers and physicists. The main point is that physical theories are being brought to the essentially philosophical test of a fresh analysis of the actual data of our experience. This is shown, in the third lecture, to react on the antithesis of mechanism and vitalism, facilitating the recognition of life as a distinctive type of phenomenon, open to empirical study without needing to be explained away into physics and chemistry, or else referred to a hypothetical vital force or energy. Simultaneously, recent philosophical analysis has undermined the idolatry of "mechanism." The fourth lecture, after an historical survey of theories of mind, and a discussion of the causes of the present chaos in psychology, attempts to support the suggestion that the concept of "behaviour," freed from the exaggerations and prejudices of friend and foe which now beset it, may offer a basis for the reconciliation of the divergent tendencies which now divide psychologists. The fifth lecture is devoted to reviewing the attitude of philosophy to religion and theology, and the main tendencies in the Philosophy of Religion, more especially the revival of Theism.

It will thus be seen that I have tried to do little more than play an intelligent showman's part,

though in selection, emphasis, and criticism, as well as in the general synoptic aim, I naturally betray the direction in which my own thinking runs. Still, my chief aim has been to interpret to my audiences the thoughts of some of the best thinkers of our own generation. To those whom I have thus ventured to expound I would now acknowledge, with sincere gratitude, my obligations for the use I have made of their writings in these lectures. There is no need to assure them how acutely I am aware of the inevitable shortcomings of my treatment. No summary presentation of tendencies of thought, eked out here and there by specific quotation or allusion, can possibly do justice to the many excellent books enumerated in the bibliographies appended to each chapter. But I hope my lectures nowhere fail to make clear that they are intended, not as substitutes for, but as guides and stimuli to, first-hand study. I have reason to think that they have had this effect on many of those who heard them delivered. If in their printed form they gain additional students for some of the masterpieces of contemporary philosophy, they will not have been written in vain.

R. F. ALFRED HOERNLÉ

ARMSTRONG COLLEGE
NEWCASTLE-UPON-TYNE
December, 1922

CONTENTS

MATTER, LIFE, MIND, AND GOD

LECTURE I

SCIENCE, RELIGION, AND PHILOSOPHY

1. THERE is a famous saying in Plato's *Republic*: "He who sees things together is the true dialectician," or, as we should say, "the true philosopher."

What is meant by this "seeing things together," this *synoptic* vision of the philosopher? What need is there for it? What occasion? What demand? Does not science give us all we want? Or, else, religion?

Consideration of these questions will help to start us on our way. We are about to review some of the chief tendencies in contemporary speculation concerning the nature of the world we live in. Such an enquiry is inspired by no idle curiosity; for our beliefs concerning the nature of our world react profoundly upon our feelings, upon our conduct, upon our whole attitude. The whole spirit of our living, the way we bear ourselves, the things we

reckon of highest worth, are apt to depend on what we believe to be our place, our duty, our destiny in a world such as ours. But what sort of a world is it ? With this problem we are still wrestling, as our forefathers have wrestled with it back to the dawn of human thought. We are conscious, indeed, that our knowledge has made great strides and that new discoveries are constantly extending its boundaries. Modern science, especially in the last two centuries, has achieved triumphs far beyond anything of which our forefathers dared to dream. It has given us in many ways a different world and, correspondingly, a different attitude towards the world.

But when we survey the results attained, are there not grounds also for misgiving ? We spoke just now of " knowledge." To say that we have " knowledge " is to say that *the world is really what we think it to be.* In other words, it implies a claim that what we think, believe, affirm, is true and can be trusted ; that criticism can find no flaw in it, no ground for doubt.

If we ask, Why should the conclusions of science be trusted ? or, Why should its theories rank as " knowledge " ? we are referred to scientific *method* for our answer. Ever since Bacon and Descartes the problem of the right method for thinking, or framing judgments, about the world has stood in the centre of philosophical speculation. Now,

whatever in detail the method of science may be—and this is a question to some aspects of which we have to return—it comes to us with the prestige of undeniable success. It *works*. Science enables us to predict natural events ; more, it enables us to control them and produce them at will. All modern industry is built up by the application of science. Here, then, is knowledge which is power.

But these reflections do not suffice to put us beyond the reach of doubt altogether. For " science " is a blanket-term which covers a variety of distinct " sciences," and as soon as we look closer and compare these sciences with each other, we notice that they are, at least for the present, far from forming a single, unified, coherently articulated structure. There are sciences dealing with purely physical, or material, objects. There are sciences dealing with living beings and their behaviour. There are sciences dealing with minds. But how matter, life, mind are related to each other—this is a question to which we get ambiguous answers, or none at all. In fact, as we shall see, about the very meaning of these terms there is much dispute, not only among philosophers whom it is customary to accuse of logic-chopping and quibbling about terms, but among scientists themselves. Thus, we are confronted by the paradoxical result that a superstructure which is secure enough to " work " in

practice, rests nonetheless on insecure foundations. Each science, so we might say, deals with a fragment of the world, but the fragments fit ill together—nay, they may appear even to conflict.

Nor is this all. There are many feelings and thoughts which the world evokes in us and which we express in appropriate speech and conduct, but for which the world, as scientific thought defines its nature, offers no basis or justification. The beauty which the artist perceives in the world and renders in works of art, the moral values which we embody in the organized institutions of a social order, the perfection which a religious mind discerns and worships—what place have these in the scientific scheme of things, as that is usually presented? They have no place in it at all. They have not been considered in the framing of it. They may be not only ignored by it, but denied as having no foundation in the nature of things. Merely to mention science and religion in one breath is to stir up memories of past and present conflicts.

It is these conflicts, both within the realm of science itself in respect of its fundamental concepts, and also between it and other sides of the world of our experience, which, on the one hand, throw doubt on the sufficiency of science itself, and, on the other, are a standing demand or call for a synoptic effort. Seeing things together and thinking them together

are necessary if we are to escape from these discords in what we feel, think, and express in act. In proportion as we become acutely conscious of these discords, we experience also the desire to overcome them. We seek to transcend the fragmentariness and instability of partial views and attitudes. Is this merely a sentimental demand which the world is not bound to satisfy? Is it, in other words, unreasonable? Or is it not, rather, the very clue which reason bids us follow if we would learn to think the world as it really is? The goal of the synoptic endeavour is, precisely, to think together all the data which experience offers us. The actual success of our efforts may fall far short of the attainment of this goal, and therefore persistence in the effort requires much of the faith which anticipates what it cannot bodily possess. Still, it is no small gain for the reasonable conduct of life to feel assured that our demand for unity and stability in thought and feeling and action is not likely to be, in principle, denied by the world.

But it would be a mistake to think that the synoptic effort of philosophy requires for its satisfaction the construction of a "system," snug, tidy, all-inclusive, and, above all, fixed. The stability of an attitude towards the world must not be confused with the rigidity of a system. What we value even in the apparently most rigid systems

of the older thinkers, e.g., in Spinoza's *Ethics*, where he tries to demonstrate by the " geometric method " that man's happiness consists in the " intellectual love of God "—is the attitude, the living spirit. The stability of an attitude must rest on principles and thus be ever true to itself, but it must be also infinitely flexible and adaptable so as to meet with appropriate response the ever-changing demands of life. For, it is true, in a sense, that life is too varied and changeful to be imprisoned, once and for all, in a formula. The world moves on, and no " system " can capture it and hold it fast. We are never without fresh discoveries and theories in science, new movements in art or religion, new experiments in economic or political organization. Old social customs are always being abandoned and new fashions set up in their place. Great crises, like war or revolution, periodically threaten to engulf the landmarks by which we have been wont to steer life's course. Novelty, in this sense, is an ever-present feature of our world, and thus the problem of adjusting ourselves to facts and situations which we have never met with before is always with us—no less so in family life, in business, in politics than in the laboratory of the scientific researcher. This is the reason why the philosophical problem of " seeing things together " persists, why it is ever new, why

it has to be solved again by each generation in terms of the fresh data of its experience.

Thus, we are not setting out in these lectures to construct yet another system of philosophy. We shall not even attempt to bring the whole field of modern life and thought within the scope of our synoptic survey. Human learning has become too vast, human civilization too many-sided and complex, for any single human mind to encompass them, as Aristotle may, perhaps, be said to have encompassed them in antiquity, or St. Thomas Aquinas at the close of the Middle Ages, or Leibniz in the seventeenth century, before the modern mind had fairly got into its stride. Our task is to be a much humbler one. We are to pass in review some of the most recent movements of thought on the problems of Matter, Life, Mind, and God—or, in other words, movements of thought in physics, biology, psychology, and theology. On the other hand, with all those currents of contemporary thought and feeling which are, before our eyes, remoulding the relations of classes and nations we shall not be concerned. So, too, we shall leave aside all movements in the realm of private morals, or, again, in the realm of art. A truly comprehensive programme of synopsis would demand the inclusion of all these, as also of history, and of many sciences not mentioned above. But we must be

content to limit ourselves and to select, from the realm of theories, scientific and theological, a few problems which must needs stand in the centre of discussion whenever men debate what sort of a world it is in which their lives are cast.

We are to make the experiment of looking for evidence that contemporary movements of thought on these problems are not mutually incompatible, but hold out the promise of forming parts of a coherent pattern or order. In this sense, and to this extent, we shall try to practise the philosophical art of " seeing things together " on the science and theology of our day.

2. In the realms of theory which we are about to enter, we must be prepared for a good deal of discussion which is technical and, in the common phrase, " abstract." All the more important is it that we should keep vividly with us, throughout, a sense of the many-sided context of human life and work, of the whole pageant of human history and civilization, out of which even the most abstract theories have sprung and within which they never cease to have their roots. Only imagination can help us here. Let us, therefore, evoke a picture which may, as a sample, stand for countless other pictures taken from the story of our race upon this earth. Let us suppose ourselves to be standing on the Northumbrian uplands, above the valley of the Tyne, where

the crumbling remains of the great Roman Wall run along the crests of the hills from east to west as far as the eye can reach. It is a scene sufficiently desolate—with the ruins at our feet witnessing to the fall of an ancient empire, with sparse sheep browsing on the fell-side, and here and there a lonely farm-house tucked into the folds of the hills. Yet, even so, there is scarce a spot on which the eye can rest but bears the impress of human hands. And behind the hands there are the minds, using the natural resources which they find, in the measure of their knowledge of them, for the appeasing, first, of the urgent needs of bodily life, and, next, for the gradual upbuilding of a civilization the essence of which is to make physical things and physical forces instrumental to, and expressive of, spiritual values. It is easy to say that man has touched but the surface of nature, here or anywhere: that sky and mountain, river and sea, are what they always were and would have been had man never appeared upon the scene. Granted: man cannot alter the movements of the stars or the vagaries of the weather or the tides of the sea. He may level hills to build his cities, but he does not turn mountain-ranges into plains. He may canalize rivers for navigation or dam them to irrigate his fields and supply power to his turbines, but he cannot make rivers to run if Nature has not provided them for him.

He may drain marshes and fill up a Zuyder Zee, but he cannot make dry land where there are oceans. But, granting all this, it still remains true that the actual environment in which civilized man lives is one which he has made what it now is, to suit his needs, to realize his aspirations, to express some belief concerning the meaning and purpose of his life. Wherever civilization has established itself, there the virgin soil and the untrod forest are no longer found. The farmer's fields and meadows have been worked and tended by generations, the trees have been planted, the crops sown, the animals bred by human hands. Wherever man has taken control, he has step, by step, as he progressed in knowledge and the power which is knowledge, elicited effects from Nature which Nature, left to herself, would scarce have produced. Consider, for example, the many species of domesticated animals and plants which man has bred out of their "wild" progenitors as he first found them. The creative intelligence of man has been in historical times one of the chief agencies of organic variation.

But let us continue our experiment. Let us turn from the lonely uplands down to the populous valley, where villages and townships cluster round mines and factories on the river bank, where road and railway and telegraph run to the distant city. Let

us turn to the city itself where the streets are crowded with traffic, where buildings climb high into the sky, where in shop and office, church and college, men gather on their various businesses bent. Once more what a transformation of Nature! The once bare hillside is covered with structures of brick and stone and cement. The original forest survives as scarce a name. What was once a babbling brook runs in a covered conduit and serves as a sewer. The river banks are lined with mighty works, and ocean-going steamers float where once a ford crossed the river.

Yet this is but the surface, the visible scene. The meaning and purpose of it all appear only when, in terms of the human mind, we interpret this transformation of the pathless jungle and the untilled glebe into farm and factory, road and city. If we would understand it all we must take it as what it really is, and talk of it in terms of agriculture and handicraft, of industry and commerce, of trade and politics, of war and peace. And last, but not least, we shall have to speak of things of beauty created for the sheer joy thereof, of knowledge sought for its own sake, of the struggle of good and evil, of the worship of God. Everywhere the visible scene is the symbol of spiritual fact. A dwelling-house is, at its lowest, a shelter against storm and wind, heat and cold, but at its normal best it is a home and the setting

of family-life. Farm and factory are unintelligible except as creations of intelligence applied to the satisfaction of wants. Schools and colleges serve the realization of educational ideals. Only a knowledge of religion will explain the edifice of a church —its existence, its design, the use of its various parts, the symbolism of its total structure and its detailed ornament.

What has not Man made of Nature! How closely interwoven are what Nature gives and Man has made of the given. Materials are given—"raw," until human hands and intelligences impose upon them form and shape, eliciting use and beauty from their varied natural qualities. Forces, too, are given, the "laws" of which we cannot alter, but we can obey these laws and thus bend the forces to our purposes. In proportion to the growth of civilization does the actual environment of our daily living become an environment of things made, shaped, arranged by ourselves to satisfy our ever-increasing needs—an environment of tools and instruments which secure, not merely the necessities of bare existence, but comforts and luxuries, and which make it possible to set free from the incessant struggle for survival energies for the cultivation of beauty and knowledge for their own sakes. When we reflect on all the achievements of our modern civilization we may well repeat, with deeper

meaning, the Greek poet's pæan of the triumph of Man :

There are marvellous wonders many
  Where'er this world we scan,
Yet among them nowhere any
  So great a marvel as Man.
To the white sea's uttermost verges
  Afloat this miracle goes,
Forging through thundering surges
  When the wintry southwind blows :—
And the Earth, Heaven's Mother, divinest born,
The eternal, deathless, unoutworn,
Still plied with an endless to-and-fro
As the yearly ploughshares furrowing go,
  By Man is fretted and torn.

The blithe swift careless races
  On light wing flying in air
With speed of his wit he chases
  And takes in a woven snare :
All deer in the wild wood running,
  The deep sea's diverse kind,
Are snared in toils by the cunning
  Of Man's outrivalling mind.
Strength of the lion, lord of the hill,
Yields to Man's overmastering skill ;
With his proud mane bowing under the yoke
The rebellious horse is tamed and broke,
  And the mountain bull to his will.

He hath found out Speech, and the giving
  Of wings to his high, proud Thought ;
And the ordered spirit of living
  In Towns his mind hath taught ;
Shelter from arrowy shafts
  Of the bleak air's frost and sleet ;
There is nought in store but his crafts
  Shall have armed him ready to meet ;

He fronts with fresh devices
The future's every shape :
Only, despite his cunning,
The Grave still mocks all shunning ;
Disease may root her vices,
But Art hath learned escape.[1]

3. If Sophocles could write thus of the power and cunning of man in the fifth century B.C., how would he have written in our age of inventions and machines! Of beauty he might now find less, of power vastly more. Whithersoever he turned, he would find knowledge applied to the task of subduing Nature to human purposes. It is a bare commonplace to say that our age of machines is an age of applied science, an age which has taken for its motto Bacon's maxim that "knowledge is power"—power to be used for improving man's estate. The vast and rapid expansion of science, especially during the last hundred and fifty years, is profoundly altering the attitude of modern man towards the world. This development of science has come on the top of the revival of classical learning which we call the Renaissance, of the religious emancipation which we owe to the Reformation, of the voyages of discovery and colonial expansion which carried the civilization of Western Europe to all corners of the earth. It has accompanied the rise of nation-states,

[1] From Sophocles, *Antigone*, second chorus (Headlam's translation).

each with its distinctive culture, language, and national feeling. It has gone hand in hand with the development and spread of democracy. It has made possible the modern industrial system, with its huge aggregations of workers in factory-towns and its far-reaching changes in the economic and social relations of men. With all these successive transformations and expansions of his outlook, a subtle change has come over the spirit of modern man—a change born of the new sense of power with which science has endowed him. A new quality of hopefulness, of confidence in the future and in the destiny of the human race on earth, marks now his attitude. "Progress" has become his watchword. Belief in progress has replaced the legends of a golden age in the past, of a paradise lost. Our paradise lies in the future and is to be built by our own strength and knowledge. In this form, the belief, as Professor J. B. Bury has recently shown in his *History of the Idea of Progress*, is a peculiarly modern phenomenon. Moreover, this new hopefulness and confidence draw their main inspiration, not from trust in the loving care of a personal God, but from the conviction that through knowledge the human race will increasingly become master of its own fate. Mankind is learning, and will continue to learn, ever more completely how to control the conditions of its existence on earth, including the working of

men's own bodies and minds. Health and happiness for as many human beings as possible—such is the gospel of this new "religion of humanity." For a religion it is—a religion of devotion to the service of man, a religion in which morality joins hands with science, the latter supplying the means for the victory over poverty, disease, and vice which the former proposes as the end. The achievement of happiness by the use of all the resources of knowledge for the elimination of evil—thus one might formulate the programme of the new spirit. Here is a typical utterance: "That the control of nature through the advancement of knowledge is the instrument of progress and the chief ground of hope, is the axiom of modern civilization. . . . The good is to be won by the race and for the race; it lies in the future, and can result only from prolonged and collective endeavour; and the power to achieve it lies in the progressive knowledge and control of Nature."[1] Here is another: "Of all the modern steps towards international unity, the most indisputable, the most firmly based and farthest reaching, is science, and the various applications of science, both in promoting intercourse between different parts of the world and in alleviating suffering and strengthening and illuminating human life. The more prominence, therefore, that we can secure for the growth of

[1] R. B. Perry, *Present Philosophical Tendencies*, pp. 4, 5.

science in the teaching of history, the larger place humanity, or the united mind of mankind, will take in the moving picture of the world." [1] On all sides science is praised, and rightly praised, as being progressive, co-operative, international, beneficent, or, at least, beneficent when combined with the will to use only for good ends the immense powers which it confers. But this goodwill is universally assumed by the apostles of the religion of humanity, for they are commonly themselves burning with hatred of injustice and evil, and many of them have been zealous champions and devoted workers in the cause of reform.

Nonetheless, it is a large assumption to make. It is one thing to hope much from the power for good which science brings. But a power for good is also a power for evil. Hence, it is another thing to hope much from men's will to seek the good and nothing but the good. Moreover, are we even agreed, do we know beyond the shadow of doubt, what the good is? If we press these questions, we soon find that the optimism of the new spirit is dogged by pessimism, that its hopefulness is easily by disappointment turned to despair. We would all like to believe, with Mr. Bertrand Russell, that if men would only take thought and show goodwill, they could rid themselves in a few years of all the major ills

[1] F. S. Marvin, *The Unity of Civilization*, p. 32.

which now afflict them. But why do we take thought so little, or so often think badly when we do? Why do we show so little goodwill? Why do we profess high ideals and so constantly fail to carry them out? If the War has taught us nothing on this point, what of the Peace? The Peace Conference at Paris has shown to all of us that the world with which our statesmen have to deal, is rapidly becoming too vast and complicated for the knowledge of any group of men to be equal to the wise ordering of it. But, what is far more ominous still, human character, i.e., the quality of the purposes of nations, as expressed in the decisions and actions of their representatives, looks like being even more unequal to the demands made upon it. Our passions constantly becloud our vision of the common good. The " Great Society " of mankind, as Mr. Graham Wallas calls it, is a fact which is daily becoming more firmly established, especially in the interlacing of the economic interests of all peoples. But Mr. Wallas seems right in arguing that so far we have failed to develop the type of mind required of citizens of the Great Society. Neither our power of understanding one another nor our power of organized co-operation have, so far, proved adequate to the need. Slowly, all too slowly, we are learning to think and act internationally. Moreover, our failure to organize the relations of

nations on a basis of peaceful co-operation is repeated in our failure to organize the relations of peoples and the relations of races. A cynic might find ample opportunity for the exercise of bitter humour in the contrast between mankind's triumphant control of non-human Nature and its conspicuous failure to manage itself. It is as if human minds were too small to solve man-made problems—in knowledge too ill-equipped, in purpose too impure. For nineteen hundred years the white race has been schooled by Christian discipline : the present state of Europe shows how little it has profited by the lesson.

Thus, the gospel of man's place and destiny in the world which the religion of humanity offers is subject to grave deductions on account of the defects in human nature itself. But it is undeniable that it has proved capable of expressing the best feelings and aspirations of some of the ablest and most public-spirited men, especially of the Victorian Age. After Comte had formulated it in France, John Stuart Mill transferred it to England, where it has become, so we may fairly say, the working-creed of all scientists who have shaped their world-view under the vivid impression of all that science has done, and promises still to do, for the alleviation of the human lot. Darwin's theory of evolution did much to dispose men's minds in favour of such an attitude.

We know that Francis Galton, Darwin's cousin, was profoundly struck by the theory of evolution as implying the *ascent* of man. The thought of the human race evolving under the influence of factors discoverable by scientific methods inspired in him the vision of the intelligent control of the evolutionary process, of the application of knowledge to the guidance and acceleration of that process. He wrote of this inspiration as " a virile creed, full of hopefulness, and appealing to many of the noblest feelings of our nature." It made him the founder of the science of Eugenics. Another scientific worker of that age, Metchnikoff, known for his researches into the possibility of postponing old age and death, was similarly inspired by the thought of the dependence of human progress on science—a thought which came to him through Buckle's *History of Civilization*. In Tyndall, in Huxley, we find the same attitude. In our own day, it is eloquently voiced by Soddy and by many others. Its influence has penetrated into all departments of modern life, wherever scientific ways of thinking have found entrance. Through the development of psychology, it has taught us that there is a *technique* in the control and moulding of minds. Our educational practice is being transformed by new experiments in methods of teaching and training. The arts of advertisement and political propaganda

play upon our feelings and beliefs, for better or worse. Social psychology sets itself to study the behaviour of men in society, and the motives from which it springs, in order to supply a psychological technique for statesmanship.[1] Psycho-analysis is perfecting a method for discovering, and curing, the causes of many morbid derangements. It is beginning to formulate valuable hints for moral training. Even in the suggestion that crime is disease and demands to be healed by the psychiatrist rather than to be punished by the judge, no less than in the Taylor system for securing increased output and efficiency from industrial workers, we can trace the influence of the ideal of managing men to better effect by " taking thought," i.e., by the application of science.

It was only to be expected that this new movement should find expression also in contemporary philosophy, for in philosophy the human spirit reflects upon itself and gives an account to itself of what it is and what it wants. The Pragmatism of William James, the Humanism of F. C. S. Schiller, the Instrumentalism of John Dewey, all emphasize different aspects of the new attitude. Schiller

[1] Cf. Graham Wallas, *The Great Society*, ch. ii, p. 20 : " The science of social psychology aims at discovering and arranging the knowledge which will enable us to forecast, and therefore to influence, the conduct of large numbers of human beings organized in societies."

stresses the way in which all thinking is controlled by purposes, by problems to be solved, by things to be done. James dwells most on the part which thinking plays in the guidance of behaviour, and on the way in which the consequences of acting out our ideas teach us to discriminate between good (true) and bad (false) thinking. He, too, preaches the gospel of Meliorism, i.e., the urgency and hopefulness of the moral endeavour for the elimination of evil, for the perfecting of man and of his world. Dewey sums up in the concept of " creative intelligence " the call to us to take thought about human affairs, and to apply scientific methods to the problems of educational and social reform. The term " creative " expresses better than any other the quality which contemporary thinkers acclaim in the characteristic spirit of our age. It meets us again in Bergson's *Creative Evolution*, in the pages of which we find that bold, imaginative picture of humanity, as the chief bearer of the cosmic *élan vital*, galloping forward into the future like an army of horsemen destined to put even death to flight.[1] In profounder metaphysical speculations, as in the Gifford Lectures on *Space, Time, and Deity* of the

[1] Cf. *L'Évolution Créatrice*, end of ch. iii, p. 295 : " L'humanité entière, dans l'espace et dans le temps est une immense armée qui galope à côté de chacun de nous, en avant et en arrière de nous, dans une charge entraînante capable de culbuter toutes les résistances et de franchir bien des obstacles, même peut-être la mort."

realist, Professor S. Alexander, the modern spirit appears in the emphasis on evolution as the movement of the world towards perfection, whereas in the writings of the Italian neo-idealists, Croce, Gentile, and others, it appears in the emphasis on mind as " pure act." And in both theories the ultimate reality of *time* is affirmed as the condition of progress and creative advance.

We have already noted, above, that this modern attitude appears in many of its representatives as a religion, or, at least, that Comte's " religion of humanity " is one of its most characteristic forms. As such, it challenges comparison with the traditional forms of religion, or, rather, it is a phenomenon of revolt against certain features of the traditional theology. The lines of affiliation and contrast, here, are many and tangled. But two among them are clearly marked. One is the line of *moral* revolt which J. S. Mill, for example, voiced in his posthumous *Essays on Religion* and which bases itself on the difficulty of reconciling the existence of evil with the belief in a God who, as all-good and all-wise, cannot have willed evil, and who, as all-powerful, could have prevented it. The other is the *scientific* revolt against " physico-theology," i.e., against the theologizing form of science which set itself piously to explore the world for evidences of the goodness, wisdom, and power of the Creator.

But this emancipation of science from theology, and the abandonment of *design* in favour of *cause* as the explanatory principle of science, brings us to another aspect of our topic.

4. So far, we have been considering the distinctive cast which science, as *power*, has, in alliance with morality, given to the feelings, thoughts, and actions of many modern men.

But this is only one side of the story. Science has helped to shape the modern mind and its way of conceiving the world, not only as power, but also as *theory*. As theory, science is a body of propositions, or judgments, in which a certain constitution and character are affirmed of the world. As scientists, we claim to know that the world has the character which these propositions ascribe to it. Or, recalling the language which we used at the beginning of this lecture, we may say that, when we equate science with "knowledge," we affirm that the world really is what we, as scientists, think it to be.

Now, a theory about the character of the world we live in is, as we also reminded ourselves, bound to have consequences for the way we feel and the way we behave. Particularly important, in this respect, has been the emancipation, just mentioned, of science from theology. For it implies that, in scientific thinking, we ascribe to the world a char-

acter which may contradict, and which certainly is different from, and lends no direct support to, the character affirmed of it by religion and theology.

What is this character which scientific theory ascribes to the world?

The most general and inclusive term for the world, so far as science deals with it, is *Nature*. Hence, too, when science is contrasted with theology, what is meant is "natural science," and the contrast is between thinking of the world as "Nature" and thinking of it as "God." But what does "Nature," here, include or exclude? Let us take the answer which the most recent interpreter of science, Professor A. N. Whitehead, gives in his *Concept of Nature*.[1] Nature, he tells us, is "that which we observe in perception through the senses." What is thus disclosed to our perception is assumed by us to exist in its own right, apart from the fact that we perceive it or think it. Relatively to our acts of perception we regard it as self-contained and independent. We assume that its existence and character would be just what they are if we did not perceive it at this moment at all. In Whitehead's vivid phrase, Nature is "closed to mind." This means that, in studying Nature, we can ignore its relation to our minds, to us as percipients and

[1] See especially pp. 2–5.

thinkers. So, likewise, Nature is, for science, closed to " moral and æsthetic values whose apprehension is vivid in proportion to self-conscious activity."

Let us pause for a moment to consider what this last statement implies. It implies, we must declare at once, a very considerable selection, or abstraction, from what Nature means to us in the concrete context of everyday life. For, it is there tinged for us by every kind of experience through which it is interwoven with our lives. It certainly is the realm of " that which we observe in perception through our senses." But it is, also, much more than this. It is the scene of our bodily activities. From some of the objects within it we have to win the satisfaction of our needs : others we may have to fight for our very existence. Some may thrill us by their beauty, others make a claim on our sympathy and care. For, let us bear in mind that the phrase, " that which we observe in perception through the senses," covers all that we ordinarily distinguish as human beings, animals, plants, and inanimate objects. Towards these diverse objects we have diverse relations. We feel and behave differently towards them. Yet, Whitehead's formula is designedly chosen in order to *level away*, as irrelevant to pure science, these differences between the non-living and the living, or, again, between living beings

which have minds and those which have none.[1] Similarly, it eliminates all differences in our attitudes and responses to these different kinds of things, and thereby all " æsthetic and moral values." Yet, when we ordinarily speak of " Nature," the term echoes for us something of the beauty which thrills us, of the power which strikes us with fear, of the order in her system which fills us with intellectual satisfaction, of the religious sentiment of awe which may be evoked when beauty and power and order are joined with mystery and immensity. Thus, clearly, the scientific meaning of " Nature," i.e., the character which science ascribes to Nature, is something much more narrow and artificial than the character which Nature discloses when all the resources of our experience are allowed to count. This is what we mean when we say that science selects or abstracts. To acknowledge this is not to find fault with science for its method. To this selective, or abstracting, method science owes its

[1] At the end of his *Principles of Natural Knowledge*, Whitehead touches in some tantalizingly brief sentences on the appearance of *life* in " Nature," identifying it with *rhythm* in the events which we " observe in perception by our senses." But, valuable as this suggestion is, it does not carry us far towards understanding the functioning of a living organism. Still less does it help us to understand mind as expressed in Nature, i.e., as expressed through the perceptible behaviour of certain kinds of organisms. This shows very clearly that Whitehead, whose own special science is applied mathematics, has constructed his concept of Nature to fit the requirements of theoretical physics, rather then the requirements of biology or psychology.

precision and its successes, in theory and practice. Science, as a method, consists in this abstract way of looking at the world. It selects and uses out of the general context of human experience certain data as evidence, and rejects all the rest. It uses certain concepts in framing its theories and avoids all others. That is the privilege of its characteristic technique. But, we must note and emphasize the contrast between the character of "Nature" for science and its character for concrete experience, precisely because this contrast presents one of the chief problems for philosophical synopsis. For, the individual scientist, as a man, may be also a poet and a believer in God, but, as a scientist, he will keep poetical or religious modes of thinking and feeling out of his science, at least if he plays the game of science according to the usual rules. The description of a natural event in the language of religious emotion will not for him count as relevant evidence. The beauty or sublimity of natural objects, for all that they are intensely real to the artist's perception and enjoyment, he will ignore. That human needs and interests should depend, for better or worse, on natural processes and laws is an accident to the investigator's dispassionate gaze. He looks at Nature with the eyes of pure and, as it were, disembodied perception and intelligence. Nature, for him, lies wholly in the plane of observation and logic.

This is not to deny, of course, that within these limits the concept of Nature also undergoes a vast development at the hands of science. For, not only do scientific observation and experiment bring to light regions of fact wholly beyond the reach of everyday perception, but, above all, science emphasizes the character of order and law throughout Nature, where common experience finds much chaos and caprice. Still, the broad fact remains undeniable: the characteristic method of science consists in practising such a selection from the context of human experience that the resulting object has to be described in terms from which the language of human desire or feeling, of æsthetic enjoyment, of moral endeavour, of religious love, is in principle excluded. This being so, it is the more significant to find Whitehead admitting, at the end, that " the values of Nature are perhaps the key to the metaphysical synthesis of existence," i.e., to what we have described as the philosophical problem of " seeing things together."

But there are many other ways, still, in which science has revolutionized our ways of thinking of Nature and of our place, as human beings, in its scheme. Older ways of thinking, which have left an abiding mark on our language and our literature, interpreted natural processes " anthropomorphically," i.e., on the analogy of human behaviour, and

construed the whole scheme of things " anthropocentrically," i.e., as centring round the welfare and destiny of the human race. It is characteristic of modern science that it has challenged all these anthropomorphic and anthropocentric types of belief and driven them from the field, at least in their crudest forms. Mediæval thought, accepting the cosmology of the Book of Genesis, found the meaning of the universe in the drama of man's fall and redemption enacted upon the earth as the centre of the universe. But when astronomy changed from a geo-centric to a helio-centric theory, not only was the earth displaced from the centre of the solar system, but man was, so to speak, dethroned with it. One may still meet with scientists who, having been brought up, as children, on the older beliefs, now find a grim emotional satisfaction in contrasting the immensity in time and space of the stellar universe with the insignificance of the earth and of man upon the earth. The theory of evolution in the nineteenth century has helped to intensify this attitude, both by exhibiting the evolutionary derivation of man from lower forms of life, and by predicting, on astronomical grounds, the ultimate extinction of all life on the earth. Thus, astronomy and biology have combined to revolutionize the traditional cosmology. Human history and civilization shrink to the dimensions of a mere episode on

" one of the meanest of the planets," and man appears verily as the helpless plaything of the blind forces of Nature. How should the hopes and fears and imaginings of a creature so puny supply the clue to a theory of the universe ? Let man's desires and feelings be what they may, the majesty of objective fact remains untouched by them and reveals itself only to the disinterested eye of science. Those who follow this line of thought to its bitter end are apt to deal less gently with " values " than just now we found Whitehead doing. In art, morality, religion they see nothing but the mirage of feelings and desires seeking a make-believe satisfaction. Anything so incurably " subjective " and " human " they would rigorously eliminate from the objective contemplation of facts as they are.

If we may not be anthropocentric, neither may we be anthropomorphic. The use of human analogies in explaining natural processes and events is not permissible in science. The most familiar expression of this attitude is the so-called " mechanical theory of Nature." This is a sustained protest against the theory of *agency* to which common thought is committed, without knowing it, by the active and passive tenses of the verbs of current speech. The sun melts the ice, the flowers are killed by the frost—thus, with unconscious personification, we talk of things as doing and suffering where

strict science bids us talk only of the " correlation of events according to law." Causality, for science, no longer connotes activity; and with activity have gone the allied notions of will, purpose, design, intelligence. In one way this change has been all to the good. The substitution of the question, How? for the question, Why? has supplied science with an inexhaustible programme for research into the laws according to which phenomena are connected. The concept of law has emancipated science from the " animism " of primitive thought which looked for the explanation of natural events to the capricious will of some spirit or demon. But, on the other hand, the mechanical theory has raised grave difficulties of its own. Its most triumphant successes have been in those sciences in which, as in astronomy, physics, and chemistry, no question of life or mind arises. But, when we pass to the study of living beings and, even more, of conscious and intelligent beings, the mechanical concepts work more and more awkwardly. It is not that we, here, pass necessarily beyond the sphere of " law." The difficulty is rather that life and mind seem each to be something distinctive and unique, and that the terms in which we analyse those physical objects which are non-living and inanimate, hardly suffice for a complete account of beings which, though their bodies are " material " and " perceptible by the

senses," yet exhibit the characters of life and, it may be, of intelligence and will. Thus, we are brought from another angle to the same difficulty which we noted, a short while ago, in Whitehead's concept of Nature. The sharp distinction between body and soul, matter and mind or consciousness, which is so common and marked a feature of current scientific views, is largely the result of the desire to escape from these difficulties by eliminating from "Nature," as the subject-matter of science, all facts which, like consciousness, do not fit into the mechanistic pattern and cannot be dealt with by theoretical physics.

And, lastly, if the mechanical theory of Nature excludes explanation in terms of human, or animal, purpose and mind, it excludes, *a fortiori*, all explanations which refer to the will, or design, of God. Modern scientists do not employ the "hypothesis of God." The famous *Bridgewater Treatises* were the last considerable attempt to theologize in science. Since then it has become the established practice of science to avoid theological language. The break is complete. Science no longer bids us admire God's wisdom, power, or goodness as displayed in creation. It no longer explains the arrangements it finds by saying that God made them just so, and that, therefore, they are for the best. It does not mention God at all. Whether this "break" with

theology necessarily implies an irreconcilable conflict remains to be seen. It may turn out to be more of the nature of a division of labour—a legitimate result of the methodical abstraction which, as we have seen, science practises, but which need not be held to invalidate the æsthetic, moral, and religious modes of experience.

But it is just because science abstracts that it cannot be "synoptic," or take the place of philosophy, which seeks to transcend abstract points of view in order to see things together and to comprehend the world as a whole.

5. So far we have been tracing, in its main ramifications, the profound influence which science, both as power and as theory, has had upon the ways in which modern man conceives the world and, therefore, also upon the ways in which he responds to the world in feeling and act. Especially have we noted how, both as power and as theory, science tends to lead men to doubt, and often to abandon, not only the theological creeds which are our historical heritage, but also the religious attitude itself, the religious way of taking and valuing the world, of which the creeds offer a reflective formulation. Yet, this picture of the modern man and the modern spirit which we have drawn is, strictly, no more than the picture of an increasingly powerful *tendency* in contemporary civilization. It is

not a faithful portrait either of that civilization as a whole or of the mind of the average educated individual. True, both civilization as a whole and the average individual are profoundly influenced by the scientific thinking which reaches us all through contact with the scientists in our midst and with their lectures and books. But, they are also shaped and moulded by a large variety of other interests and experiences and by a wealth of tradition kept alive, partly through literature and education, and partly through the modes of feeling, thinking, acting which are fostered and standardized in the organizations of Church and State. So far as physics influences us, we talk of the world in terms of matter and motion. When we think biologically, we talk of life and behaviour. As psychologists, we use the language of consciousness and mind. But we are interested, too, in industry and commerce, in art, in morals, in politics, in religion, and accordingly we talk and think and act also in terms of wealth, of beauty, of goodness, of citizenship and government, of God. In the vocabulary which any moderately educated man—any newspaper-reader, shall we say?—daily uses, fragments of all these technical languages play their part. And with each language the individual adjusts his attitude and response, more or less, to the characteristic point of view which it expresses.

Yet what a babel of languages it is! What a chaos of attitudes and points of view! We are saved in ordinary life from bewilderment and confusion, because we acquire, in greater or less measure, the useful habit of switching over from one point of view and language to another, without experiencing the transition as a discord and, therefore, also without feeling the need for a reconciliation, a synopsis. Yet, when we once, in explicit reflexion, bring all these diverse aspects of our civilization into a single focus, what a thing of fragments, of shreds and patches, even of conflicts, it then appears! The demand for unity in outlook and attitude then becomes wellnigh irresistible. Yet, the wider a man's interests and contacts, the more difficult is he apt to find the achievement of such unity. For, it requires a comprehensive theory of the *Universe* in which all sides of his life have their place—the sort of theory, in short, which it is the traditional aspiration of philosophy to supply. Paradoxically enough, in modern education, and especially in modern " higher " education, we do not attempt or profess to provide such a theory. We cannot provide it because we have not got it. Our civilization has not yet achieved reflective expression in any single philosophical form. We have plenty of philosophies, but no philosophy; plenty of " tendencies " and " movements " and experiments,

but few common premises and still fewer common conclusions. Religion which once supplied focus and unity to civilization has lost this central position, and the consequent secularization of education has intensified the disintegration of our intellectual world. The subjects taught at our universities and colleges offer a fairly representative cross-section of that world, yet it would be difficult to gather from a survey of them any unified and coherent system of what, in the name of " knowledge," we believe the Universe to be. The very increase of knowledge compels teachers to specialize to a point where the power of synopsis is inevitably lost, and students to sample the intellectual world in so many disconnected places that it does not seem to be a *world* at all but only a collection of atomic subjects. And, thus, as subjects are subdivided and information grows in volume, the problem of eliciting from all these separate bits of theory a unified interpretation of the world becomes increasingly unmanageable. Let alone that our educational systems leave it mainly to our private initiative to determine and cultivate our attitudes to art and politics and religion. No wonder that for all our " education " few of us have a unified outlook upon life or that fine stability of character which is almost unattainable without such an outlook.

It is, perhaps, fortunate for our peace of mind

that most of us hardly feel the problem. We are so busy living that we have no time to take stock of our beliefs, no time to realize how incoherent they usually are, no time to ask whether they are true, or how far, in our manner of living, we are true to them. Such stability as we possess rests largely on the comforting sense that each shred of belief is shared by many of our fellows and perhaps backed by special authority as well. For the rest, absorption in our work is our salvation. For the work of each of us is, at once, his readiest channel of self-expression, reflecting in its successes and failures his good and bad qualities of intelligence and character, and it is, also, his contribution to that total achievement of the human spirit which we call our civilization. Without reflecting on it, we all draw some strength and inspiration from the fact that in this total achievement we co-operate alike with those who have gone before us and with those who will come after us. Even if utter extinction be, as some hold, the ultimate destiny of the human race and all its works, yet here and now this participation in the creative effort of the human spirit saves our individual lives from being merely ephemeral and ineffective.

But, if once reflection awakens us to the need for a synoptic effort, it is hard to draw back. And here we may well draw courage from the support of a

distinguished scientist who, in the midst of his scientific researches, has always kept his mind open to the larger outlook. From him we can learn that science, though by its abstract method it does so much to stimulate, and so little to satisfy, the demand for a synoptic attitude, is yet not hostile to our endeavour. Professor J. A. Thomson, surveying in his *System of Animate Nature* the whole field of biology, defines his goal as a " Philosophy of Animate Nature," i.e., " a consistent thinking together of what we know and feel about Animate Nature along with what we know and feel about other orders of facts." A striking phrase is this—" what we know and feel." It finds its fuller explanation in such utterances as these : " We get closer to some things through feeling than we do through science " ; or, " the tendency of feeling is always to see things whole—synoptically." And, above all, " we cannot, for our life's sake, and for the sake of our philosophical reconstruction, afford to lose in scientific analysis what the poets and artists and lovers of Nature all see. It is intuitively felt, rather than intellectually perceived, the vision of things as totalities, root and all, all in all ; neither fancifully, nor mystically, but sympathetically in their wholeness."

" Intellect " and " feeling " are, indeed, empty terms until we translate them concretely into the

scientist's theory and the poet's vision of the same object. They are different, but are they incompatible? Is not each by itself impoverished for lack of the characteristic excellence and truth of the other? The poet's vision uninformed by science degenerates into sentimentalism. The scientist's analysis tends to destroy the sense of the whole, whilst his suspicion of " anthropomorphic " extravagance often leads him to put into words something less than the total impression he receives. Can it be, one wonders, that laboratory research, just because of its inevitably artificial conditions and manipulations, lends itself to the use of the language of physico-chemical mechanism, whereas most field-naturalists, studying living creatures in their natural haunts and enjoying Nature as an unbroken whole, talk unhesitatingly anthropomorphic language? However this may be, Thomson is clearly a lover of Nature as well as a scientist, and in this lies, we may boldly say, his superior objectivity. The result is not bad science, but better philosophy. For the fuller use of experience provides additional " pathways to reality," i.e., pathways to a total view of Nature. Such a total view will not exclude the effects, on our own minds, of the contact with Nature in contemplation and enjoyment, for such contact with Nature has, as Thomson justly says, a " tonic virtue." Unrest and petty cares and

mean thoughts drop away as we learn to perceive and appreciate the power, order, beauty, intricacy of the web of life. Without this contact we are impoverished, with it we are made strong in hope and faith.

Of course, Thomson is dealing with "Animate Nature," i.e., with the subject-matter of biology, not simply with "Nature," which latter term, as we have seen, orients us rather towards mathematical physics. It is no mere accident that a biologist should show himself more keenly alive to the need for a synoptic philosophy than a physicist. Without doubt, the abstractions of scientific method are easier to practise in proportion as we face away from all facts which suggest the presence and efficacy of mind in the world. But though we may take up and maintain such an attitude by a kind of methodical make-believe, a moment's reflection on the full world of concrete experience should convince us that such a position cannot be final. Biology shakes its foundations. Psychology ignores it. Its inadequacy becomes patent when we turn to the concrete achievements of mind in history, in social and economic life, in government, and in art. And any sane theory of religion transcends it altogether.

BIBLIOGRAPHY

The following books, which obviously are but a selection from the available literature, may be recommended to those who wish to follow up the argument of Lecture I with further reading :—

1. Alexander, S. *Space, Time and Deity*, 2 vols. (Macmillan & Co., 1920.)
2. Bosanquet, B. *The Principle of Individuality and Value.* (Macmillan & Co., 1912.)
3. Bosanquet, B. *The Value and Destiny of the Individual.* (Macmillan & Co., 1913.)
4. Laird, J. *A Study in Realism.* (Camb. Univ. Press, 1920.)
5. Marvin, F. S. (editor) *The Unity of Western Civilization.* (Oxford Univ. Press, 1915.)
6. Marvin, F. S. (editor) *Recent Developments in European Thought.* (Oxford Univ. Press, 1920.)
7. Merz, J. T. *A History of European Thought in the Nineteenth Century*, 4 vols. (Blackwood, 1896–1914.)
8. Pringle-Pattison, A. S. *The Idea of God in Recent Philosophy.* (Oxford Univ. Press, 1917.)
9. Russell, B. *Philosophical Essays.* (Longmans, Green & Co., 1910.)
10. Russell, B. *Mysticism and Logic.* (Longmans, Green & Co., 1918.)
11. Soddy, F. *Science and Life.* (John Murray, 1920.)
12. Sorley, W. R. *Moral Values and the Idea of God*, 2nd Ed. (Camb. Univ. Press, 1921.)
13. Thomson, J. A. *The System of Animate Nature.* (Williams & Norgate, 1920.)
14. Whitehead, A. N. *The Concept of Nature.* (Camb. Univ. Press, 1920.)
15. Whitehead, A. N. *The Principles of Natural Knowledge.* (Camb. Univ. Press, 1919.)

The claims advanced on behalf of science and scientific method may be studied in No. 11, in several essays in Nos. 9, 10, and in Mr. Marvin's contributions to Nos. 5, 6. Nos. 14, 15 illustrate impressively how one of the most original among living physicists looks at Nature. The sharp distinction between Nature and the human beholder, between the object known and

the knowing mind, which science postulates, has been elevated to the dignity of a fundamental philosophical principle by the movement known as " realism " or " neo-realism " (illustrated by Nos. 1, 4, 9, 10). With Nos. 2, 3, 8, 13, 14, the point of view and the argument of the preceding lecture have most affinity. No. 7 is invaluable as a mine of information about the development of thought, both scientific and philosophical, in the nineteenth century. It is from Dr. Merz that I have adopted the term " synoptic."

LECTURE II

THE PRESENT-DAY REVOLT AGAINST "MATTER"

1. IN the first lecture our aim had been to bring home to ourselves the need for a synoptic effort—a need resulting from the bewildering number and diversity of the currents and systems of thought which our civilization, as a whole, has produced and which impinge upon all educated men and women in proportion to the range of their interests, practical and theoretical. This need becomes doubly great when systems of thought which appeal to us with equal strength, though perhaps on different grounds, appear to conflict and to compel us to make a choice between them. Here, so we held, is the great opportunity for philosophy, the function of which is to stand for the ideal of "thinking together" the whole of human experience, taken as revealing in all its modes and forms —through what we feel and will no less than through what we perceive and think—something of the nature of the world we live in.

The undeniable vastness of such a synoptic programme is no excuse for not attempting it at all. If we could satisfy ourselves that some measure of order and harmony obtains where, at first sight, all is confusion and conflict, it would be no small gain. If we could convince ourselves that some of the most important tendencies of contemporary thought, so far from being as isolated from, and repellent to, each other as on the surface they may seem to be, hold out a promise of fitting together into a unified world-view, we should be amply rewarded for our effort. At any rate, for better or for worse, the effort to " see things together " is worth making.

Our programme calls, in to-day's lecture, for a review of current tendencies of thought in the " philosophy of Nature." By this term we mean the philosophical criticism—be it by philosophers, be it by philosophically-minded scientists—of what the natural sciences, and more particularly physics, have to tell us about " Nature," not in its details, but in its general character. And " criticism," here, does not mean fault-finding but interpretation—nay more, appreciation. Its purpose is neither to correct the sciences nor to do their work for them. For *Ersatz*-science there is no room. But there is room, and need, for a reflective estimate and appreciation of what the sciences, severally and together, have achieved in the way of making known

to us the fundamental character of the world we live in. To know a thing, as we said in the first lecture, is to believe that it is really and truly what we think it to be. Each of the sciences teaches us to think of the world, or, at least, of that portion of the world which is its chosen subject-matter, as having a certain definite character and structure. The philosophy of Nature is interested in these characters and structures, in the evidence on which they are affirmed, in their coherence and compatibility with each other, and ultimately, too, in their coherence with the evidence of those modes of experience of which, as of the æsthetic, the moral, the religious experience, the natural sciences take no account. Such criticism and interpretation of scientific concepts and theories is, clearly, synoptic in tendency and effect. It does not claim to assist the scientist in his investigations. It does not make him a better observer or experimenter. He can, if he pleases, ignore it all as irrelevant for his purposes and limit his attention strictly to the detailed problems of his special field. But he cannot help becoming a philosopher himself the moment he chooses to consider the relation of his field of work to, and the bearing of his results on, the fields and results of other scientists, or, again, the fields and theories of students of art or morality or religion.

In this lecture, however, we shall confine ourselves to one natural science, viz., physics, which, by teaching us to think of Nature as "material," has profoundly affected all our other ways of thinking of Nature. Ever since modern physics began with the work of Galileo and Descartes, its influence on other sciences, as well as on philosophy, has been immense. Hence it is of the utmost interest and importance for our synoptic programme that philosophically-minded physicists are, once again, becoming keenly critical of the concept of "matter," and are thereby led, once again, to speculate about the foundations of their science in the facts of experience. When physicists themselves turn philosophers and, like Whitehead, confess the "incoherence" of their traditional theories of Nature, philosophers may well expect some grist for their own mill. Especially Whitehead's two recent books, *The Principles of Natural Knowledge* and *The Concept of Nature*, have with good reason been hailed as the most illuminating contributions of our day to the philosophy of Nature. Whitehead's criticisms of "matter" and his fresh interpretation of "Nature" are full of value for our synoptic programme, just because Whitehead approaches his problems throughout by way of the relation of physical concepts to the ultimate data of experience.

2. It has been wittily said that "we know too

much about matter to be any longer materialists." This saying may serve as a text for the present lecture. Let us consider in what sense, if any, it is true.

Our best way to begin is to make clear to ourselves that the term " matter " is exceedingly ambiguous. Like every other term which has for centuries been a centre of discussion and controversy it has gathered round itself a variety of meanings which are, commonly, not clearly distinguished. We shall best prepare ourselves for an appreciation of Whitehead's attack on " matter " by making a preliminary survey of the chief senses in which the term " matter " has come to be used. In each of these senses there is a vague echo of some philosophical or scientific theory. Thus, for example, most of us have probably heard it said that " idealists," like Berkeley, " deny the existence of matter," and have wondered how anybody can be such a fool. It is a pleasant fashion among many scientists, in their anxiety to clear their " science " from any taint of " philosophy," to hold Berkeley up to scorn as the type of a " metaphysician," which term, to them, means a person who flies in the face of commonsense and denies the reality of what to everybody else is obviously most real of all. For, the " matter," the existence of which Berkeley is supposed to deny, is by his critics taken

to mean tables and chairs, trees and animals, the air we breathe and the ground we walk on—in short, the physical objects of everyday life, including our own bodies. No wonder that the denial of their existence seems nothing but a gratuitous paradox. On the other hand, we have all heard, too, of "materialists" who declare that matter is the only reality and the ultimate principle of explanation for everything, or who, in other words, deny that anything is real except matter. But, what becomes of this theory of mind and God? The implied denial of the existence of mind seems as much an offence against commonsense as Berkeley's denial of matter, and the implied denial of the existence of God is uneasily felt to be an attack on religion. The suspicion that science is committed to "materialism" arouses misgivings, if not hostility, in many quarters and tends to bring undeserved discredit upon science. But in this whole situation there is much confusion of thought, resulting from the failure to distinguish the different senses of "matter." We are all far too apt to take it for granted that we know what the term "matter" means. We argue and take sides without asking first in what sense, precisely, Berkeley denies, or physicists affirm, the existence of matter, and whether in either case the paradoxical consequences really follow from the sense intended.

Thus, a discrimination, however rough, of the different meanings of " matter," and of the contexts to which each meaning belongs, is indispensable both for clearness of thought and for a just appreciation of the position of physical science in our own day.

The following enumeration, though by no means exhaustive, will suffice for our purpose :—

1—There is the meaning of matter as opposed to mind or spirit.

2—Matter, or the material world, may be used as a blanket-term for all objects of normal, waking perception as opposed to the objects of hallucination and dream.

3—Matter may mean the atoms, electrons, and similar imperceptible entities, which scientific theory postulates for the explanation of perceptible phenomena.

4—Matter may mean the imperceptible cause of our sensations.

These four senses of " matter " are all different from each other, but they are not easy to distinguish —in fact, they are frequently confused—because *there is a single, central situation in the different analyses of which each of the different senses takes its rise.*

It will assist our argument if we state this single, central situation at once, and then show how each

of the different senses of matter arises from a different analysis of it.

Physics is an empirical science. That is to say, its ultimate data—the facts from which it starts and which it seeks to explain—are data, or facts, of "experience." Experience, here, means sense-experience, sense-perception. With facts of sense-perception, or sensible "phenomena," the physicist begins; they provide his problems. With facts of sense-perception, too, he ends; to them he appeals for the verification of his theories. Whatever the terms may be in which he formulates his laws, these laws must apply, in the end, to phenomena open to his observation and, preferably, capable of being checked and confirmed by the observation of others. This explains the central position of observation, with or without experiment, in the physicist's procedure. He may frame hypotheses concerning imperceptible entities and processes, but his justification for doing so will be that in no other way can he explain, or predict the occurrence of, the phenomena which he perceives.

The central situation, then, is that physics, as an empirical science, finds it subject-matter within the field of what we perceive by our senses. This is, as we saw in the last lecture, what Whitehead, too, means when he defines the subject-matter of science as "Nature," and identifies Nature with

" what we perceive by the senses." The philosophical criticism of physical theory thus becomes inevitably, in Whitehead's phrase, a " philosophy of the thing perceived," i.e., a study of the problems raised by different analyses of the processes and objects of perception.

It is in this context that we can most conveniently locate, and distinguish, the four different meanings of " matter."

(1) Matter and mind, or spirit, have often been distinguished in the past by saying that matter is passive, mind is active, or that matter is " extended," i.e., occupies space, whereas mind does not. But, in this form the distinction has ceased to interest contemporary thought. Nowadays, we use the distinction between mind and matter most often in the attempt to differentiate between the subject-matter of physics and that of psychology, between the " outer " world of " Nature " and the " inner " world of " consciousness." But both these worlds —seeing that each is being dealt with by an " empirical " science—must fall *within* " experience" in the widest sense of that term. Thus, the distinction between them is best interpreted as one of the most emphatic ways of acknowledging the fact, already recognized by us in the last lecture, that physics selects and abstracts. As Mr. Norman Campbell puts it, " the whole field of our experience

is not the domain of science, but only a very limited portion of it."[1] Whitehead's principle that "Nature is closed to mind" is another way of putting the same distinction. To say, as Campbell and many others do, that physics has for its subject-matter the "material" world means that it studies "what we perceive by the senses" without reference to, or in abstraction from, the processes of perceiving, thinking, reasoning, etc., which are involved in the studying; in abstraction, too, from the student's feelings, desires, and other "mental" processes. All these are part of our "experience" in the widest sense, but when we restrict physics to "matter" as distinct from "mind," we exclude these ranges of experience from its scope. By the same act, as we have seen, our æsthetic, moral, religious reactions to the world which we perceive by our senses are ruled out from the realm of physics.

This, then, is the first sense in which "matter" may be interpreted. It is a sense strictly relevant to this context, and to this context only. "Matter," or the material world, here means the world of "what we perceive by our senses," abstracted, in the manner characteristic of physics, from "mind," i.e., from the rest of our experience. "Matter"

[1] Cf. *Physics: The Elements*, p. 238. (Camb. Univ. Press, 1920.)

(with its synonyms, "Nature," the "external world," the "physical world") signalizes this methodically maintained attitude of abstraction.

(2) But, the description of the subject-matter of physics as what we perceive by the senses is, according to some authorities, still too wide. And, correspondingly, the meaning of "matter," and "material world," has to be further restricted to those objects of perception which we commonly call "real," as distinct from those which are "unreal." The golfer who has partaken of whisky not wisely but too well, may see two balls, but his testimony is not accepted by any physicist as good evidence. Hallucinations are commonly as vivid as, and often much more impressive than, ordinary percepts, but they do not count as "facts" for physical theory to explain. The objects and events which we witness in dreams may *in themselves* be indistinguishable from similar objects and events perceived in waking, yet, once again, they are not included among the data of physics. These examples may serve to remind us that, although these several kinds of experiences must be classed as perceptions, what we perceive on these occasions is not accounted as "real" and forms no part of what the science of physics deals with. In other words, the physicist, if his observations are to be good evidence for the purposes of his science, must

make his observations when he is neither drunk, nor subject to the influence of drugs, nor the victim of hallucinations, nor asleep and dreaming. No phenomena perceived under such conditions will be recorded as physical facts or furnish occasion to physicists for further research. They may be investigated by physician or psychologist, but the physicist will simply rule them out of his domain. There are, indeed, border-line cases, e.g., so-called after-images, on which the decision, one way or the other, seems arbitrary, but, broadly speaking, the physicist's "material world" covers all those phenomena which are "real" in the sense that they can be perceived by more than one observer, so that one man's perception of them can be checked and confirmed, either simultaneously or subsequently, by that of others. To talk, with Norman Campbell, of "universal assent" as the test of what is for the physicist "material," in the sense of "real," is, perhaps, to use too large a word. But getting one's perceptions confirmed and corroborated, or, if necessary, corrected, by others is a recognized procedure, both in ordinary life and in science, for guarding oneself against illusions of one's own senses. It is, for example, by this test that most physicists reject the evidence offered for the existence of ghosts, and for the occurrence of other "supernatural," or, at least, abnormal,

phenomena, such as are investigated by the Society for Psychical Research. Though the evidence is voluminous, and though there are even cases in which several observers have perceived the same ghost, ghosts have not yet made good their status as " real " at the bar of physical science.

It is, however, to be observed that in all the experiences which the physicist rejects, something, whatever it may be, is really perceived. An after-image may not count as " real " for the physicist, but it is none the less a genuine phenomenon *after its own kind* ; and the same is true of illusions of the senses, hallucinations, dreams. The delusions of drunkards and drug-fiends exhibit a considerable degree of " assent." Moreover, all these experiences obey laws which we can ascertain. They occur regularly under appropriate conditions, such as the action of alcohol or drugs on the nervous system. Whitehead, thoroughgoing in his application of the principle that Nature consists of what we perceive by the senses, includes them in " Nature." But physics, as practised by most physicists of our day, excludes these " unreal " objects from its scope and, assigning them to other sciences, such as psychology or psychiatry, labels them " purely mental." They are said to exist " merely in the mind." But, then, physicists are apt to use " mind " as a picturesque appellation for the rubbish-heap of

all those facts of experience for which they have no use.

Thus, our examination of the second sense of "matter" and "material world" has led us into a fresh context, involving not merely, as before, a reduction of the world of experience to what we perceive by the senses, but a further severe selection by the physicist even among the objects of perception. He not only samples Nature most commonly under highly artificial laboratory conditions, but he admits phenomena as "real" only subject to the test of "assent" by several percipients. This second sense of "matter," therefore, embodies the commonsense distinction of "real" and "unreal" objects of perception, the former being "material," the latter "merely mental."

(3) The third sense of "matter" introduces us to yet a further manipulation of the notion of "what we perceive by the senses." In fact, it takes us beyond the realm of sense-data altogether and introduces us to a world of entities which are frankly acknowledged to be inaccessible in themselves to our senses, though indispensable for the occurrence of the phenomena which we can, and do, observe. Of this order are the atoms and the ether of the older physical theories, and the "electromagnetic theory of matter" of our own day. Current discussions about the "constitution of

matter" move wholly in this sphere and are conducted in terms of corpuscles, ions, electric charges, etc.—all of these being entities which, though affirmed to be "real," are in their very nature imperceptible by our senses even when aided by our most powerful instruments of observation. More familiar instances of material processes of this sort are the air-waves which are correlated with the sounds we hear, or the light-waves ("oscillations in the luminiferous ether") which are correlated with the colours we see. This third sense of "matter," thus, takes us into yet another context. We are now no longer concerned, as we were in the first two senses of "matter," with determining what belongs, and what does not belong, to the data, or subject-matter, of physics. We are concerned now with the explanatory theory of physics—with "scientific objects," as Whitehead calls them to distinguish them from the "perceptual objects" and "sense-data" which have occupied us until now.

At this point we may observe a curious shift of emphasis and interest in the attitude of many physicists. Without explicitly challenging or denying the principle that Nature is what we perceive by our senses, and without ceasing to use their senses for observation, they yet tend to look upon the world of sense-experience as if it were a sort

of veil which stood between us and the imperceptible objects of scientific theory, and as if our having to use our senses were a handicap and a limitation rather than an opportunity and an advantage. The spectrum, for example, exhausts the colours which we can actually see, but the scale of "light-rays" extends beyond both ends of the visible spectrum, so that we speak, e.g., of ultra-violet rays to which no colour corresponds that any human eye has ever seen. Similarly, sound-waves extend beyond both ends of the scale of tones audible to our ears. The physicist is interested in the light-rays or sound-waves as such, and in their properties and laws. Whether visible colours or audible tones are, or are not, correlated with them, is irrelevant to him, though it was the perception of colours and sounds that first gave him a clue to these light-rays and sound-waves. Again, different observers may vary widely in their colour- or sound-judgments, whereas the entities of physical theory possess a stability very satisfying to the intellect. For these and similar reasons, many physicists tend to deprecate the world of sense-perception by comparison with the world of physical theory. Norman Campbell gives typical expression to this view when he writes, "Colour and pitch are not in any way fundamental in physics; it would be perfectly possible to leave out of our

treatises any mention of them and out of our experiments any use of them, and yet to leave the science of physics essentially unchanged. So far as I can see, persons totally blind and totally deaf from birth could appreciate as well as anyone else the significance of all the propositions of physics."

On the other hand, thinkers like Whitehead, who on this point continues the attitude of physicists like Ernst Mach and Karl Pearson, do not countenance this depreciation of the world of sense-perception, and maintain, rather, that the significance of scientific theories lies in their power to explain and order the data of perception. The purpose of all our efforts to develop our physical theories to the utmost extent is to make Nature, as perceived by the senses, more intelligible.

At this point, therefore, we come upon a profound divergence in the interpretation of physics. But we shall be better able to appreciate the issue after we have paid some attention to the fourth sense of the term " matter."

(4) This fourth sense is for our argument the most important of all, as it is also the most familiar to students of philosophy. It is reached from the third sense, which we have just been discussing, by regarding colours, sounds, smells, etc., as " sensations " or " mental impressions," and explaining them as *effects* which are *caused* by the action of

"matter," or "material objects," on the percipient's mind. This theory is a very plausible one for two reasons. One reason is that it falls in with our ordinary habit of speaking of colours, sounds, etc., as "impressions received from the world outside, or around, us." The other is that it looks very much like a somewhat crude version of the physiological theory of perception in terms of "stimulus" and "response." Moreover, it is fatally easy to confuse it with the third sense of "matter," for it seems plausible to identify the material objects which are supposed to cause our sensations with the atoms, corpuscles, rays, etc., of the physicist's theory. But just because the confusion is easy (and, therefore, also very common), it must at all costs be avoided. Hence it is most important to make clear to oneself what the difference is. The difference is this. On the third view, colours, sounds and other sense-data are *bona fide* natural *phenomena*, parts of "Nature" as "what we perceive by the senses." On the fourth view, they have become "sensations" and are classed as "mental." As such, they cease to be parts of Nature, with the result that Nature no longer includes the colours we see, the sounds we hear, or any of the other sense-data, but is restricted to the imperceptible entities and processes which are supposed to cause sensations of colour, etc.,

in our minds. Thus, the two views differ in that the third view counts sense-data as part of Nature (part of what we perceive), whereas the fourth view counts them as part of Mind (part of the percipient's inner consciousness). The two views draw the line between Nature and Mind in different places, and whilst the third, for all that it credits Nature with much that is not perceptible, does not break with the definition of Nature as " what we perceive by the senses," the fourth view breaks so sharply with that definition as, in effect, to abandon it altogether. At the same time, it is characteristic of the fourth view to hold that all we directly know of Nature consists of these sensations produced in our minds. But, if so, how do we know what has caused them, or how can we verify our guesses on this point ? A long line of philosophical critics—and of scientists, too—has laboured to point out the difficulties and improbabilities in this account, and to re-establish the principle that colours, sounds and other sense-data are natural phenomena, and parts of Nature as " what we perceive by the senses." Berkeley was the first of these critics, and it is in this fourth sense, and *only in this fourth sense,* that he denies " the existence of matter." He was the first to re-affirm, in opposition to Locke and others, that the colours we see and the sounds we hear are genuine phenomena, i.e., objects which we perceive,

and not merely states, or modes, of the percipient's own mind. On this ground he claimed, fairly enough, to be the champion of commonsense. He defended our right to trust our senses against the "scepticism" lurking in the view that what our senses perceive are effects caused by an "unknowable somewhat."[1] Again, "materialism" is built on this fourth sense of "matter." It is to this sense of "matter," and to no other, that the saying applies, "We know too much about matter to be any longer materialists."

To sum up and recapitulate: The four different senses of "matter" which we have distinguished are best understood as arising in the course of different interpretations of the principle that physics, as an empirical science, has for its subject-matter "Nature," or "what we perceive by the senses." The first sense of "matter" serves to exclude from the field of physics all reference to mental activities and to the values connected with feeling and will. The second further excludes the objects of certain perceptions as unreal or abnormal. The third correlates what we perceive with a world of imperceptible entities and processes, inferred by scientific theory. The fourth treats the objects of

[1] The above, of course, is far from being a complete account of Berkeley's whole position, but it does put right a common misinterpretation of that position as necessarily incompatible with, and hostile to, physics as an empirical science.

perception as mental sensations caused by non-mental objects.

Each of these four senses of " matter," with the context to which it belongs, raises problems of great philosophical interest. But the fourth is for us the most interesting of all, because once again we are witnessing at the present day a revolt among philosophically-minded scientists against the mutilation of Nature which it involves. This revolt bids fair to inaugurate a new chapter in the history of the philosophy of Nature, and we must now turn to a closer consideration of it. But, before doing so, let us emphasize once more that this revolt against " matter " and " materialism " is not a denial of the existence of anything which physics rightly affirms to exist. It is not a denial of the existence of atoms or corpuscles or light-rays or sound-waves. It is not a denial of the " electro-magnetic theory of matter," or of any other specific and established physical theory. The denial of " matter " with which we are concerned is neither more nor less than the denial of the *theory*—which is quite different from all these—that what we perceive is mental sensations, and that Nature is the material Something which causes these sensations to occur in our minds. Nothing else is at issue but this theory of what Nature is and of how it is related to our minds. If, for example, anyone

were to deny the existence of matter in any sense which implied that Sir Ernest Rutherford's epoch-making experiments on the disintegration of the atoms of certain chemical elements under bombardment by α-particles expelled from radium were a mere fairy-tale, he would justly deserve the scorn which some scientists like to pour on "idealists" and "metaphysicians." All that is in question when we speak of a revolt against "matter" is *the truth of a certain theory concerning the nature of what we perceive and the causes of our perceiving.* This is the special context which we have to bear in mind throughout all that follows.

3. Let us, now, state fully and explicitly the theory to be examined.

By "Nature" we have agreed to mean the whole scene, including our bodies, which our senses present or disclose to us—the world of things we perceive. Strictly, what each of us perceives at any one moment is only a fragment, a more or less limited section of this world. Beyond the range of what we actually perceive there lies all that is perceptible, though it may never actually be perceived by anyone. Nature, then, is the world of actual or possible sense-perception. Further, we commonly assume that the fragments of Nature which each of us perceives may overlap, or, to put it more simply, that different percipients can

perceive the same objects and events. In short, we regard the world of Nature as, in principle, common to all percipients.

But, what is it that we actually perceive? Our first impulse will be to answer this question by enumerating some of the things which we here and now perceive, or which at once occur to us as perceptible—the walls and desks of this room, the persons in it, the trams and motor-cars the noise of which comes to us from the street; in short, the whole assemblage of things which constitute the familiar environment of our lives—earth and sky and sea, mountains and rivers, trees and animals, human beings and all the works of their hands.

But, further, of these objects what precisely do we perceive? The answer will surely be: their qualities—their colours and shapes, their tastes, smells, temperatures, the sounds they make, their feel to the touch. It will not occur to us to give any other answer, for our very language, with its substantives and adjectives, imposes this type of answer on us. Perhaps you have remarked that the benches in this lecture-room are uncomfortably hard. Well, if so, you have translated your painful experience of sitting on them into language which names a "thing" (the bench) and attributes to it a "quality" (hardness). The grammar of our

language thus expresses our habit of thinking in terms of things and their qualities.

A "habit of thinking," did we say? The phrase may well give us pause. We ought not to let it pass unchallenged. Is it merely a trick of ours thus to think? Is it an arbitrary pattern which our minds impose upon Nature, because they are built that way? Is not Nature "really" composed of things and their qualities?

These questions are not asked with the intention of throwing doubts on our habits of thinking. We have no desire to infer that Nature is really quite different from what we think her to be. We take our stand, now as before, on the principle that Nature is what we think her to be, subject only to the proviso that bad thinking can be corrected by better. To abandon this principle is to deny the very possibility of knowledge.

But, the purpose of our questions is to force us to realize that, in thinking in terms of things and qualities, we do put an *interpretation* on the evidence of our senses. We do adopt a *theory* of what it is that we perceive. By all means let us say that the theory is true, and even that the very facts which we perceive compel us so to interpret them. But, granting all this, our immediate task is still to distinguish between the interpretation, the theory, and the ultimate data of perception which are thus interpreted.

What are these ultimate data of perception? The best language to use about them, when we thus try to attend to them apart from all interpretation, is to say that we perceive a "tissue," or "together," or "mass," of colours, sounds, temperatures, touches, etc.; and that we perceive them, not as atomic items, but as a continuous and continuously changing flow or stream. At the basis, thus, of the articulated world of things lies, as the ultimate fact of perception, this constantly changing tissue of what—choosing the most neutral and non-committal words we can find—we will call "sense-data," or, with Whitehead, "sense-objects." The knowledge of Nature, the discovery of what Nature is, begins for all of us at this point. We begin as children at this level. We advance rapidly to the next level which, adopting again Whitehead's terminology, we may call the level of "perceptual objects," i.e., the things with their qualities of common parlance. But, only if we are scientists do we advance to the third level, the level of "scientific objects," i.e., the entities and processes affirmed by the theories of physics and chemistry. These are the three stages in the development of our knowledge of Nature. Obviously the earlier stages are the foundation of the later and persist as integral factors within it. The scientist, in his observations, constantly draws upon his perception

of sense-objects, and by this means he discriminates the "things" he handles in his laboratory or in field-work just as ordinary mortals do, though with more precision. And the whole process is an advance in *knowledge*, i.e., an advance in the interpretation, by thinking, of the evidence of our senses—an advance towards a complete revelation of what Nature really is. This follows from our principle that to "know" Nature is to believe that Nature is really what the progress of thought, and especially of scientific thought, reveals her to be. The interest of the "philosophy of Nature" lies in analyzing, on the basis of this principle, the logic of the progress of thought from stage to stage.

Now, the theory of "matter"—the "materialism" of common parlance—which we have to discuss and which we shall find reason to reject as untenable, is a particular theory of the nature of sense-objects and of their relation, on the one side, to the percipient's mind, and, on the other, to "scientific objects."

The essence of this theory is to be found in the following propositions:—

(1) Sense-objects (colours, sounds, etc.) are "sensations" and, as such, states of the perceiver's mind. They are "subjective."

(2) By this classification of sense-objects as "mental states," or "mental impressions,"

they are, at once, excluded from Nature as " physical " (" material," " objective ").

(3) Hence, they cannot be in any proper sense qualities of physical things (theory of " secondary qualities " : strictly, we should not say, " the sky is blue," but, " it produces a blue sensation in our minds ").

(4) As mental states they are *effects* produced in us.

(5) The *cause* of these effects is matter, or material things, acting through our sense-organs, nerves, and brain on our minds.

(6) The manner of this causation is mechanical, i.e., by contact, or impact; hence the physical cause must possess the " primary qualities " of shape, size, solidity, resistance.

Two points, especially, stand out in this materialistic theory. The first is that the world of Nature is stripped of all sense-objects, of all colour, sound, smell, temperature, etc., which are all denied to Nature by being classed under the heading of " mind," with the twofold result that (a) our ordinary way of speaking of perceptual objects and their qualities involves a complete illusion, and (b) that what remains of Nature must be conceived as consisting only of imperceptible entities, possessing only the primary qualities. The second point is a *causal* theory of perception : the sense-objects

which we perceive are the effects produced in our minds by the action of the imperceptible entities on our sense-organs. In short, it is a theory, not merely of what Nature is, or is known to be, but also of what Nature does to the mind of the percipient.

The net result is that Nature is split in two. What we directly perceive (the tissue of sense-objects) is divorced from the realm of scientific objects, which latter now figure precariously as the hypothetical and unverifiable causes of the impressions in our minds.

Some physicists, straying into the field of philosophy of Nature, have endorsed this materialistic theory under the impression that it is at least in harmony with, if not actually implied by, the science of physics itself. But these adventurers are misguided. For, closely considered, nothing could well be less in harmony with this theory than the actual method of scientific investigation. As observer and experimenter, the physicist gets his evidence of what Nature is, and does, in the first instance through his senses. Yet, on the theory, this evidence consists of nothing but subjective impressions in his mind, and he is still separated from Nature by a gap which he can bridge only by means of a precarious hypothesis concerning the imperceptible Somewhat which may have caused

of the adventures and transformations which it undergoes in the course of time. Thus we get the close association of matter, space, and time in current theory. A nuance of sophistication crept into this somewhat naïve concept of a universal stuff, or substance, when Aristotle, in his *Physics*, imported into the discussion the logical concept of a " subject " of which " attributes " can be predicated. " Substance " and " subject " fused in the notion of a " substratum " in which attributes " inhere." But, this very language suggested a distinction between the attributes (e.g., the colours, sounds, touch-qualities, etc.) and the substratum (e.g., matter), thus facilitating a tendency to push the substratum into the position of an unknowable and indefinable Something-or-other to which the attributes somehow belong.

This tendency received additional impetus, and the " bifurcation of Nature " was completed, by the rise, in the seventeenth century, of the transmission theories of light and sound. According to these theories, what we see are colours, but what enters the eye are colourless, and indeed invisible, waves of " luminiferous ether " ; what we hear are sounds, but what enters the ear are air-waves, in themselves silent and soundless. How, then, can colours and sounds inhere as attributes in this sort of substance—an oscillating medium ? The easiest

way out of the difficulty was to cease thinking of colours and sounds as qualities, and to think of them as effects instead, viz., effects produced in the observer's mind by the motions in the physical substance. Thus, the theory of matter which we are criticizing may be described as the offspring of an unholy marriage between the old search for an ultimate substance and the new causal theory of colours, sounds, etc., as sensations produced in our minds. This twist of the theory makes out of the world actually perceived by our senses a subjective illusion, and out of the material world which causes it the object of a doubtful guess. One half of Nature, as Whitehead puts it, becomes a "dream," the other half a "conjecture."

Thus, we come back to a moral which must be, by now, amply familiar. The theory which declares the colours, sounds, and other sense-objects which we perceive, to be "mental," and which postulates an imperceptible "matter" as the cause of these mental effects is untenable. Present-day criticism of it endorses the remark which Berkeley already aimed at "matter," taken in this sense. "There can be no use of matter in Natural Philosophy," was the bishop's blunt way of putting it,[1] and through Whitehead's mouth modern philosophy of Nature utters its agreement.

[1] Cf. *Principles of Human Knowledge*, p. 50.

5. For the synoptic point of view of these lectures it is no small gain, not only that this old error is, at length, being laid to rest, but especially that this result has been achieved by a happy co-operation between philosophers and scientists. We can hardly exaggerate the importance of the fact that the sustained philosophical polemic against the theory of " matter " (in the fourth of the senses which we have distinguished)—a polemic which has commonly been misunderstood as an attack on the very foundations of science itself—has at last been endorsed by a spokesman of science so acute and brilliant as Whitehead. There have been scientists before Whitehead who had gone a considerable distance in the same direction, e.g., Ernst Mach in his *Analysis of Sensations* and Karl Pearson in his *Grammar of Science*, but their attempts at an emancipation of natural science from this sort of materialism are far surpassed by Whitehead's thoroughness and originality.

The value of Whitehead's work, however, lies not only in what he pulls down, but even more in what he builds up. And this constructive work, too, is full of promise for our synoptic programme. The details of it, involving largely a new technical language, are too intricate and difficult to be presented here without doing them a grave injustice. But we must make an attempt, at least, to appreci-

ate the general direction and method of Whitehead's thought.

If we rid ourselves of the notion that sense-objects are mental impressions, and regard them now, *bona fide*, as phenomena constituting the very substance (so to speak) of Nature, what is the constructive problem which confronts us? It is the problem of showing how "perceptual objects," i.e., the "things" of everyday parlance, and "scientific objects," i.e., the space, the time, the atoms, etc., of the theory of physics, are related to the sense-objects, i.e., to the colours, sounds, etc., which supply, first and last, our contact with Nature, which are our directest evidence of what goes on in Nature. The empirical foundations of physical theory and the consistency of current physical theory with the empirical data—these supply the problems for positive construction. For, reflexion soon bears out Whitehead's severe indictment: "Scientific theory is shot through and through with notions which are frankly inconsistent with its explicit fundamental data." We must be content with a mere mention of the most striking of these inconsistencies as pointed out in the opening pages of Whitehead's *Principles*. The orthodox answer of speculative physics, as Whitehead reminds us, to the demand for an explanation of natural phenomena "has invariably been couched in terms

of Time (flowing equably in measurable lapses), and of Space (timeless, void of activity, euclidean), and of Material in space (such as matter, ether, or electricity)." In its extremest and purest form this theory demands an analysis of Nature into a sequence of momentary states, each state embracing all Nature at that moment. Thus, any one distribution of material throughout all space at a durationless instant of time will be preceded and followed by other distributions of the same material throughout the same space at other durationless instants of time. As Whitehead points out, the scheme makes it very difficult to deal with change, for the conception of a durationless instant of time excludes the reference to past and future which change involves. Similarly, there is no room in the scheme for velocity, acceleration, momentum. Again, the biological concept of an organism as a unity which functions in time and is spread through space conflicts with the traditional theory. Above all, that theory fails to include the immediate facts of perception which are the ultimate data of scientific knowledge. Its concept of space, for example, assumes the existence of points as ultimate given entities. But where is a mathematical point ever given in perception? Thus, Geometry as an abstract science deduced from hypothetical premises is one thing, but Geometry as a " physical science "

is another, and has to do with the question, How is space rooted in experience? Similarly, everything we perceive has a certain duration, however short, and nothing we perceive corresponds to the assumed durationless instants of time. Lastly, the traditional theory, in its neglect of the immediate deliverances of sense-perception, excludes from the terms in which it is stated all the facts of relativity, such as the ways in which colour, shape, sound, temperature, vary with the different points of view of different observers, or of the same observer at different times, to say nothing of the fact that each observer's world has its own space-time system.

How is this state of things to be remedied? Whitehead's full answer, as we have already confessed, is too technical to be adequately summarized here. But, we may not unfairly single out three general features of it from which we may judge both its striking originality and its significance for the kind of synoptic philosophical outlook which we are here attempting.

(1) The first, and perhaps most striking, feature of Whitehead's analysis of Nature is his insistence that the immediate data of perception—the colours, sounds, etc., which make up the varied spectacle of Nature presented to our senses—are all of them happenings or *events*. "Perception," we read, "is an awareness of events, or happenings, forming a

partially discerned complex within the background of a simultaneous whole of Nature." And, again, from the side of Nature : " Nature is a structure of events and each event has its position in this structure and its own peculiar character or quality." Whether we speak of Nature as one whole event or as a tissue of many events, is of no importance : the main fact is that there is a continuous coming to be and passing away of events. Every colour, every sound, every touch, be its duration short or long, is transient in this transient world of sense-data. Within this continuous stream, no event is, for perception, marked off from other events by definite spatio-temporal boundaries. Events are not isolated from each other atomically, like beads on a string ; rather, they melt into each other. But thought demands demarcation and definiteness. It seeks to discriminate fixed terms and relations in the continuous and ever freshly-varied flow of events, in order that science may express the essential concepts of time, space, and material as issuing from fundamental relations between events and from recognitions of the characters of events. Yet, beneath all distinctions of thought, and persisting through them, Nature, as a tissue of events, retains its fundamental character of " passage." But this passage of events which is the very being of Nature is no mere flux or

"becomingness." It is at the same time a *creative advance*, for "Nature is ever originating its own development." Indeed, the percipient, as a part of Nature, is intimately involved in this creative advance. "Hence perception is always at the utmost point of creation." In this emphasis on the "life of Nature"—the phrase is more than a poetic metaphor for Whitehead: it is but another expression for the fundamental fact that in Nature nothing is at rest, all is movement, happening, event—Whitehead is unique among physicists. But a philosophically-trained ear will be quick to catch the affinity with Bergson's *élan vital* and, through it, with an historic strain in philosophy which leads right back to Heraclitus' πανται ῥεῖ (all is flowing).

(2) If the theory of *events* is the first feature of Whitehead's analysis of Nature, his theory of *objects* is certainly the second. Here, again, a certain similarity to Bergson appears. If the senses present Nature to us as a passage of events, thought apprehends in the stream definite objects with definite relations. Thought, as Bergson puts it, "immobilizes" and "fixes" the ever-moving, ever-creating, life-impulse. It "attempts to catch nature without its passage," as Whitehead puts it. It reveals to us that "passage of events" is the first, but not the last, word about Nature. There

is that in Nature which does not pass. *Events* pass, but do not change. *Objects* can change, because they are, at least relatively, permanent. This permanence of objects is a side of Nature as important for perception as the ever-fresh profusion of transient events. For, it makes possible the recognition of a " thing " as maintaining itself amidst the flux of events, as self-identical in the change of what we call its " qualities." An event can never be repeated. An object is essentially the kind of thing which can " be again."

Objects, in Whitehead's terminology, are " situated " in events, and conversely the " character " of an event depends upon the object, or objects, of which it is the situation. It is only by means of the objects thus situated in events that we can effect a demarcation of events and thus state the laws of Nature. " Rational thought . . . would be intrinsically impossible without objects." The passage of events implies that " something is going on everywhere all the time." But what is going on anywhere at any time we can state to ourselves only in terms of the various kinds of objects which enter Nature through being " situated " in events, and which, like Plato's Forms, are exempt from passage and becoming and can thus be apprehended in their self-identity.

(3) The third feature is Whitehead's attempt to

distinguish different kinds of objects. Among these, "scientific objects," like an atom or an electron, are of especial importance for the philosophy of Nature. But this part of the theory, it must be confessed, has been left by Whitehead in a very sketchy and undeveloped state, and it is not at all easy to make out precisely how he conceives them to be related to perceptual objects ("things") or to sense-objects and the events in which sense-objects are situated. We must, here, content ourselves with the vague, but safe, statement that science is driven to infer, or postulate, "scientific objects" in the effort to "express the causal character of events," i.e., to give a precise and systematic explanation of the conditions under which sense-objects are found situated in events.

In conclusion: it is obvious how well this fresh and illuminating analysis of Nature, and of the empirical foundations of physics, lends itself to our synoptic purpose. For, the method which Whitehead here employs need not be restricted, as he, in fact, does restrict it, to the concepts and theories of physics. To the question, what kinds of objects thought can recognize in the flux of sensible events, more sciences than one supply an answer. Perceptual objects, so Whitehead argues (instancing Cleopatra's Needle), are, compared with scientific objects, too vague and lacking in precision to serve

the explanatory needs of physics. Granted—but it still remains true that these same perceptual objects may furnish the subject-matter for several other sciences which study in them characters neglected by the physicist. This is most obviously true of all those perceptual objects which we distinguish as " organisms " from the inorganic world, and of which we predicate, " life " and in their higher forms, " consciousness." These characters form the bases for the distinct sciences of biology and psychology. Our next step must, therefore, be to consider how the present-day tendencies of thought in biology promise to fit into our synoptic pattern.

BIBLIOGRAPHY

1. Poynting, J. H. " Physical Law and Life." *Hibbert Journal*, Vol. I. pp. 727 ff.
2. Mach, Ernst. *The Analysis of Sensations*, tr. By C. M. Williams & S. Waterlow (Open Court Publ. Co.)
3. Pearson, Karl *The Grammar of Science*, 3rd Ed., Part I. (A. & C. Black, 1911.)
4. Russell, The Hon. Bertrand *Our Knowledge of the External World.* (Open Court Publ. Co., 1914.)
5. Whitehead, A. N. *The Principles of Natural Knowledge.* (Camb. Univ. Press, 1919.)
6. Whitehead, A. N. *The Concept of Nature.* (Camb. Univ. Press, 1920.)
7. Eddington, A. S. *Space, Time and Gravitation.* (Camb. Univ. Press, 1920.)
8. Campbell, N. *Physics, The Elements.* (Camb. Univ. Press, 1921.)
9. Haldane, Viscount *The Reign of Relativity.* (Murray, 1921.)

For the historical background of the problem discussed in Lecture II, students of philosophy will naturally go to Berkeley's *Principles* and *Dialogues*, Hume's *Treatise*, Kant's *Critique of Pure Reason*, and Mill's *Examination of Sir William Hamilton's Philosophy*.

The article by Professor Poynting (No. 1) is an excellent example of the position taken up, about the turn of the century, by an intelligent physicist. It shows him hovering in uneasy equilibrium between an ideal of physics as concerned exclusively with the laws of "sensible events," without recourse to "hypothetical bridges," like atoms, etc., and the dim perception that the part played by such objects as atoms in scientific theory is incompatible with their being nothing more than indispensable fictions. Typical, also, is Poynting's sense of the impotence of physics when confronted by the phenomena of life and consciousness.

The first section of Campbell's book (No. 8) contains much interesting discussion of the relations of science to philosophy, and of the senses in which the scientist uses, or ought, in Campbell's opinion, to use, the terms "real" and "matter." Campbell volubly protests against being mistaken for a philosopher, but he forgets that the only safe way of avoiding that label is to refrain from discussing philosophical problems.

Professor Eddington's book (No. 7), apart from supplying a most stimulating introduction to the theory of relativity for all readers with some mathematical and physical knowledge, has also a considerable philosophical interest, especially in the Prologue, "What is Geometry?" and in Chapter XII, "On the Nature of Things." Large portions of the latter chapter are confessedly tentative, such as the suggestion that "mind filters out matter from the meaningless jumble of qualities, as the prism filters out the colours of the rainbow from the chaotic pulsations of white light" (p. 198). But such principles as these: "Physical reality is the synthesis of all possible physical aspects of nature" (p. 182), and "Reality is only obtained when all conceivable points of view have been combined" (*ibid.*), apply within the realm of physics the synoptic principle, the extension of which to *all* phenomena to be met with in human experience we are emphasizing in these lectures. Another example of the synoptic method is Viscount Haldane's book (No. 9), which traces, with great learning, the applications of the concept of relativity in science and philosophy.

The books of Mach and Pearson (Nos. 2 and 3) represent

earlier attempts on the part of a physicist and a mathematician, respectively, to remind physics of its empirical basis, and thereby to restore sense-data to their fundamental place in Nature.

Mr. Russell's book (No. 4) has important points of contact with the argument of the present lecture. He, too, rejects the theory that sense-data are mental effects caused by material objects, but he takes a line of his own in the theory that a physical thing is a " logical construction," or " class," of sense-data.

LECTURE III

THE ORDER OF NATURE: MECHANISM, VITALISM, TELEOLOGY

1. EVERY student of the influence of natural science, and more especially of physics, upon philosophy is aware that, next to the concept of " matter," the concept of " machine " or " mechanism " has presented the greatest obstacles to a synoptic theory of the universe. Or, rather, we should say that " materialism " and the " mechanical theory of nature," going hand in hand, have themselves claimed to be the one all-sufficing synopsis. Expanding the theories of physics to the dimensions of a professedly all-inclusive philosophy, they would leave no room for anything in our experience which resists absorption into their scheme. All is matter, all is mechanism; and what is neither is nothing, or, else, is a mere " epiphenomenon." Mind, for example, if not denied outright, is politely segregated and quietly ignored, rather than that the acknowledgment of its presence and effectiveness in the world should

be allowed to disturb the trim tidiness of the mechanistic theory. Yet, to call mind an " epiphenomenon " is but to hide the bankruptcy of the theory beneath the decent obscurity of a learned tongue.

In the last lecture, we had noted, as of the utmost interest for our synoptic programme, a spontaneous revolt among certain physicists and mathematicians against " matter " and " materialism " in the only sense of these terms in which philosophers have ever been concerned to combat and deny them. In the present lecture, similarly, our task will be to examine contemporary thought for indications of dissatisfaction with the closely allied theory of " mechanism." And, just as before we found that the criticism of materialism had its constructive side in a fresh analysis of Nature as " what we perceive by the senses," so here we shall look for the constructive side of the criticism of mechanism in all those movements of biological thought which declare the need of non-mechanical principles, both for the explanation of living organisms and for that of Nature as the " fit " environment for organisms to live in.

2. That living beings present obvious difficulties to the mechanical theory may be admitted even by thinkers who, nonetheless, believe that the study of living beings can be genuinely " scientific " only so

far as the mechanical theory is applicable to them. Hence biology is the field where the battle for, and against, mechanism rages most fiercely before our eyes. On the principle that offence is the best defence, the mechanist's most effective tactics are to show, if he can, that all proposed alternatives, such as " vitalism," are open to even greater objections than the mechanistic theory itself. Further, he will claim that behind any " vital principle " or " vital force " there lurk in shadowy form the concepts of " mind " and " purpose," leading to " design " and to " teleology " in the traditional sense of that term. The situation, thus, is exceedingly complex, and this complexity becomes most marked when we focus our attention on the higher forms of animal life. " Higher " here means, roughly, nearest to man in the series of vertebrates. It is an undeniable fact, which anyone can verify by a cursory survey of contemporary biological literature, that evidence drawn from man, for all that he is classed as a living organism and an animal, plays a comparatively small part in shaping biological theory. If human behaviour, as displayed in business, politics, art, etc., were included by biologists in their field as readily as they so include, e.g., Jennings's *Contributions to the Study of the Behaviour of Lower Organisms*; or if biologists studied, e.g., their own

conduct as scientists with the same loving care with which they study the " tropisms " of an amoeba, we can hardly doubt that the concepts of biology would be very different from what they are.[1] Biology, as ordinarily understood and practised, treats the human species as just a small corner of the field of living beings, and tends, in actual research, to concentrate largely on the non-human field. This is, of course, due to a variety of causes. One of them is, no doubt, that the human corner is already being very thoroughly worked over by the medical sciences. Another is that most of the experiments made on non-human animals could not, for social and moral reasons, be repeated on humans. Laboratory-technique is thus compelled to sample life in the form of plants, or, if it takes animals, in the form of micro-organisms, like amoebæ, or of insects, or of frogs, guinea-pigs, etc. But it is worth reflecting whether our theories do not take some colour from the samples of life we work with. The mechanistic tendency is observably strongest among those biologists who sample life in those forms of it which are most remote from the human. On the

[1] It is the merit of A. D. Darbishire's *Introduction to Biology* to have drawn attention to the effect on biological theory of its tendency to regard as the proper study of mankind any other living thing rather than man. Bergson's critique of biology (*Creative Evolution*, ch. i) is, of course, based on the principle that we must take our clue to the understanding of life from where we can sample it best, viz., in our own consciousness.

other hand, even the most determined mechanist finds it rather difficult to ignore mind when he comes to human life and behaviour. Still, many biologists protect themselves from a clear realization of this fact by keeping their work mainly to the non-human field, and by dealing in principles which are equally applicable to the non-human and the human material, the lower and the higher forms of life. In this way they may be honestly blind to their failure to deal with the distinctive characters of the higher forms of life, e.g., in man with intelligence and will as manifested through bodily movements and the effects thus produced on the surrounding world. Or they may cover up their failure, like Jacques Loeb, by bold dogmatic assertions. But the ordinary mechanist is only too eager, as a rule, to keep off such dangerous ground. He disclaims any desire, or power, to deal with consciousness, and finds it safest to concentrate on the study of those forms and conditions of life in which the problem of consciousness is least likely to arise.

No one can honestly say that the resulting biological theory is either stable or satisfactory. The biologist's programme calls for a study of the whole province of living beings, of all the manifestations of life of whatever degree or kind. In actual practice, and especially in experimental research, he

is compelled to sample life by selecting here and there out of its infinite range and variety. There is an immense difference between sampling life in human beings and sampling it in infusoria or algæ. There is an even more profound and far-reaching difference between the method of a biology which, in the name of being " objective," restricts itself on principle to what an observer can perceive by his senses of the life of other creatures around him, and the method of a biology which includes among the evidence admitted as relevant the observer's " subjective " or " inward " self-observation. It seems, on the face of it, unlikely that the concepts which suffice, or seem to suffice, for all that we, as outside spectators, can find out about the life of infusoria or algæ, should also suffice for all that by self-observation and communication with others we know of the life of man. No wonder that biologists, as Professor R. M. Wheeler of Harvard University points out, tend to fall into three groups of extremists :—the mystery-mongers, the simplicists, and the humanizers. The mystery-mongers appeal to some quite mysterious force or factor, postulated *ad hoc.* The simplicists leave out, not only mind, but even life as a distinctive character, and reduce whatever goes on in a living being—be it a single cell or a multicellular organism—to physico-chemical processes. The humanizers treat

all living things as if they were miniature men and women. Each of these types of extremists is wedded to a theory which it is determined to force upon the facts. If the theory does not fit, so much the worse for the facts. Fortunately, the majority of biologists are not so ready to compel all facts into a single mould for the sake of intellectual economy or tidiness. They realize that no single formula will exhaust the infinite variety of life, and that the real problem of a " philosophy of living nature " is, as Professor J. A. Thomson shows in his *System of Animate Nature,* essentially synoptic—demanding a concept of living beings which shall be plastic enough to fit their manifold kinds and the diversity of their dealings with each other and with their inorganic environment ; a concept which has room within itself for the physico-chemical basis of life at the one end and for feeling and intelligence at the other.

It may, perhaps, be thought that the issue between the divergent theories in biology might be settled by an appeal to experiment. And, indeed, experiments form part of Driesch's case for vitalism against mechanism as they form part of Loeb's case for mechanism against vitalism. But we are coming to see that in such *ultimate* questions as these there is no conclusive appeal to the verdict of a crucial experiment. The experiment yields results, no

doubt; but the correct interpretation of these results—*that* is precisely what the experiment rarely settles. What answer we get from Nature depends very much on what question we put. And it depends also, we should add, on what answer we are determined to hear. As the polemical literature of the last quarter of a century on these issues amply shows, he is a poor theorist who cannot invent a more or less plausible argument for disqualifying even the apparently most damaging evidence against his own theory. Next to the miracles of the will to believe are those of the will to disbelieve. At any rate, it should be clear that the extremist positions in biology, especially the mechanistic one, are maintained, not because the evidence imperatively demands them to the exclusion of every rival, but because they are preferred on general, and, in the last resort, philosophical grounds. This will become abundantly clear as we proceed.

Summing up, we may, perhaps, put the situation which confronts the biologist, thus:—living beings are living bodies, perceptible by the senses, and belonging by this test to the realm of "Nature." Whatever their distinctive character as "living" may be, as "bodies" they obey the laws of physics. The substances of which they are composed are the same chemical substances which compose also their inorganic and inanimate environment. Many of

the chemical compounds which occur in living bodies have been artificially synthesized in the laboratory, and the chemical character of many of the most important processes by which life is maintained, such as breathing, digestion, metabolism, has been studied and exhibited in detail. In this sense, it is possible to speak of organisms as " physico-chemical machines," even though no bit of living substance (protoplasm), and still less a living cell, has actually been manufactured in a laboratory. This failure, however, rightly counts for little, for if the theory of evolution is true, Nature's laboratory must have solved the problem of evolving living beings out of the non-living. On the other hand, for all its connexion with the inorganic, the realm of life exhibits a character unique, distinctive, and in the order of evolution qualitatively *new*. There is, too, the marked, even if relative, individuality of a living thing, be it cell or large-scale organism. The unity and self-identity of an organism are not dependent on the human observer's point of view or interest, but are given as the recognizable pattern of the organism's form, structure, behaviour. As Bergson puts it, " the living body has been separated and closed off by Nature herself. It is composed of unlike parts that complete each other. It performs diverse functions that involve each other." It is born and dies, and between these termini it grows,

matures, ages. Within limits it regenerates itself when injured, restores the wastage of tissue, reproduces itself in others of the same kind. In its reactions to its environment it maintains, as far as it can, its own existence, i.e., it continues the routine of its life ; and its resourcefulness in doing so ranges from passive adaptation to active control. Among the higher animals, if not before, and certainly in ourselves, we find knowledge and foresight in the service of vital needs. At the human level, there is an ever-increasing exploration and experimentation going on which increase man's power over his environment, which make his behaviour, singly and co-operatively, more many-sided, his desires and satisfactions more various, his experience of the world richer. The student who enters this realm of life from below will naturally try to apply the concepts which suffice for physics and chemistry. The student who begins at the upper end will as naturally seek to extend the concept of mind over the whole field. The vitalist will attempt to steer a course midway between these two and assume with Driesch an " entelechy," or with Reinke a " dominant," conceived as other than mechanical, yet as not intelligent and foreseeing enough to be of the order of consciousness.

Such, broadly, is the situation in which the issue of mechanism presents itself at the present day.

3. The " issue of mechanism " ! We have been glibly following the prevailing fashion of talking about mechanism as if we were all agreed on what the term " mechanism " means. But, precisely, what is a mechanical explanation ? The proper answer to this question is curiously difficult to discover. It might have been expected that in the voluminous controversial literature which has been evoked by the debate for and against mechanism, the disputants would have taken good care to define unambiguously just what they are affirming or denying. But it is not so. Anyone can convince himself of this by collecting typical statements from prominent writers on both sides, or even by looking up the philosophical dictionaries which in this matter faithfully reflect the prevailing haziness. He will find a variety of vague formulæ, differing more or less from each other in terminology, and all perplexingly difficult to fit to the detailed concepts and laws even of those sciences which, like physics and chemistry, rank *par excellence* as " mechanical."

The reason, as a glance at the history of the controversy shows, is that " mechanism " is prized by its advocates rather as a battle-cry and a protest than as an explanatory theory. It is valued for what it denies much more than for what it affirms. It is a symbol of emancipation. " Do mechanical laws embrace every department of the universe ?

Is there a purpose for which the universe was created, or a goal towards which it is tending? Is there a religious or moral significance behind nature, or have we to do with a mere clash of blind and unintelligent forces?" Such is the choice which a recent reviewer of Professor J. A. Thomson's *System of Animate Nature* puts before us. It is typical of the temper to which mechanism appeals. In these rhetorical alternatives the negative bias is plain. It is re-enforced by the significant iteration of the adjective "blind" in the same writer's programmatic statement of what the mechanist positively affirms: "all the functions of the body are based purely on the laws of physics and chemistry; all the activities of man would be found, if our knowledge were sufficient, to be no more than an immense elaboration of blind physico-chemical phenomena. . . . (living beings) are but minute and special cases of that vast and continuous redistribution of matter and energy, of which no complete understanding can ever enter the mind of man."

In fact, the sting of mechanism lies in its three denials. 1. It denies that Nature as a whole, or in its living parts, is the creation of God. 2. It denies that minds, human or animal, are operative as *verae causae* in the behaviour of living beings. 3. It denies the existence of any "vital" principle or force. It is a protest against talking of natural

phenomena in the language of life, or of mind, or of God. It proclaims the emancipation of the physico-chemical sciences from theology, psychology, and any kind of biology which seeks to retain its own concepts and language, at the same time that it proclaims the determination of physics and chemistry to dominate the whole field of "Nature" and to tolerate no competitor beside themselves. A reminder of the controversies between scientists and theologians which arose out of Darwin's theory of evolution, and which nowadays are happily little more than a literary echo, may serve to illustrate the point. Biology for a long time proved an obstacle to the victorious advance of mechanism. The triumphs of bio-chemistry were still to come, and, in the absence of the theory of descent, the existence of living beings seemed to point to special creation, just as their adaptation to their environment seemed evidence of the wisdom and goodness of the Creator's design. Darwin's theory of the origin of species by the accumulation of accidental variations and by the survival of those specimens which had the good luck to fit the environment, was hailed as the conquest of the realm of life by the mechanical theory of nature. The fortress of biology had surrendered. But what was there "mechanical" about the theory? Nothing but the part assigned

to " accident " and " luck "—a part, moreover, exaggerated by enthusiastic disciples of the new theory far beyond Darwin's own sober and cautious statements. It was enough that chance eliminated design, that descent was put in the place of creation, and the struggle for existence (" nature red in tooth and claw ") in the place of the care of a kindly Providence for its creatures. The fashion of theologizing in biology had received its death-blow. Thenceforth there has been as little mention of God in biology as there already was in physics or chemistry.

At this time of day, no competent judge will dispute the gain which this revolution has brought. The present position of biology is due almost wholly to the many lines of experimental research which have sprung from the effort to test, develop, correct the evolutionary hypothesis. The days of theologizing in biology are definitely past. But though the victory has been won, the victors still seem to fear the resurrection of the foe. Whether the argument be about Driesch's " entelechy," or Bergson's *élan vital,* or even only about human or animal minds, the mechanists in biology not uncommonly talk as if vitalism or psychology were but thin ends of the wedge of theology. And so they bolt and bar every door by insisting on the exclusive use of physico-chemical terms, lest God slip in again disguised as " entelechy " or " consciousness."

But granted that theology is out of place in biology, and indeed in natural science generally, this emancipation of science from theology still leaves them both fellow-members in the universe of man's spiritual experience. There would be occasion enough here for an effort at synopsis, even if the extension of mechanism over the field of biology (including physiology) had not burdened our psychology and, indeed, our whole scheme of thought about the universe, with the embarrassing problem of the relation of body and soul, matter and mind. It was one of the first mechanists in biology, Descartes, who bequeathed to us the dualism of body and soul with its attendant conundrums of epiphenomenalism, psycho-physical parallelism, and interaction, of which the first two, at any rate, are nothing but devices for making the mechanical scheme tight against any intrusion of mind, without flying so far in the face of experience as to deny outright that there is any such thing as mind at all. The last chapter in this long controversy is being written in our own day under the title of " behaviourism," and we shall have to consider it in our next lecture. Meanwhile, we may with added conviction repeat what we said already in the first lecture, viz., that the interrelations between the various sciences present no less urgent a synoptic problem than the relations between the

sciences as a whole and the other great realms of experience and thought in which as civilized men we move.

But enough of the negative side of mechanism—what of its positive side? As applied to biology, it amounts, as we have seen, briefly to this: that biology is nothing but the physics and chemistry of organisms, and that an organism is nothing but an exceedingly complex physico-chemical machine. For practical purposes, mechanists generally stop at this point. But the more speculatively venturesome among them go further and set before us, as the ultimate goal of all scientific endeavour, the reduction of the concepts and laws of ordinary physics and chemistry to those of dynamics, to "matter in motion," as the popular phrase has it. Thus, one of the leading champions of mechanism at the present day, Jacques Loeb, in his *The Organism as a Whole from a Physico-Chemical View-point*, speaks of the "visualization of all phenomena in terms of the groupings and displacements of ultimate particles." This is that "redistribution of matter and energy" which Thomson's reviewer above set before us as ultimate truth. This is that traditional scheme of explanation in terms of time, space, and material which in our last lecture we found Whitehead criticizing. This is the famous ideal of Laplace's calculator.

There are, then, as we see even now, degrees of mechanism. We may be mildly mechanical by talking chemistry, or we may be rigidly mechanical by talking dynamics. Two questions here suggest themselves. (1) Is there, as appears to be alleged, a continuous transition along the line of increasing generalization and greater mathematical precision from mild to rigid mechanism, so that mild mechanism is but a crude and provisional approximation to the ideal of rigid mechanism? (2) Does either type of mechanism really deal faithfully with all the relevant facts?

4. The discussion of these two questions must inevitably be somewhat technical, but the argument of the last lecture will have prepared us to appreciate not a few of its points.[1] The traditional theory of "matter," it will be recalled, claims to explain the facts and events which we perceive, as sensations caused in our minds by the activity of hypothetical, imperceptible particles. Adapting to our present purpose the convenient terminology of the physicist Lorenz, we may say that "macroscopic" (i.e., perceptible and measurable) bodies and movements are explained in terms of "microscopic" (i.e.,

[1] The best discussion of "mechanism" known to me is to be found in Professor C. D. Broad's paper on "Mechanical Explanation and its Alternatives," in the *Proceedings of the Aristotelian Society*, 1918–1919. The present section of this lecture owes more than I can easily acknowledge to this paper.

imperceptible) entities and motions. This scheme has the merit of extreme simplicity, in that it takes Nature to be composed of, say, electrons which are all qualitatively exactly alike, but which have different motions and are combined in many different kinds of structures. But it cannot be said, as is sometimes done, that the very possibility of " science " stands or falls with the truth of just this microscopic type of mechanism. The fact is that most sciences do not come within measurable distance of it, and, as we shall presently see, are unlikely ever to reach it. We can, and do, deal successfully with systems much more complicated, and, in fact, the success of science would seem to depend mainly on the fact that among the macroscopic phenomena with the observation of which science begins and ends, there are some, viz., geometrical magnitudes, lapses of time, masses, which are measurable with sufficient precision for determinate quantitative correlations to be traced. Moreover, whether or no the molecules of the theory of gases, and the atoms of the eighty odd chemical elements, will ultimately be exhibited as combinations of electrons, in any case there are in the macroscopic world different kinds of substances with specifically different chemical properties, and capable of differences of state (gaseous, fluid, solid) which modify their mechanical action on each other.

Rigid mechanism would be so palpably false if applied to these macroscopic phenomena that it must assume the microscopic form to save itself. As Broad puts it, " the rigid mechanist would wish to assume that the distinctions between one kind of matter and another, e.g., wood and iron ; or between one state of matter and another, e.g., between an unmagnetized piece of iron and the same piece magnetized, are only macroscopic differences, and that their microscopic correlates are always differences of number, configuration and density." But that they are so, has not only not been conclusively made out, but, on the contrary, a survey of the sciences goes rather to show that there is a hierarchy of laws of which the higher are not reducible to the lower. Delightful as it would be if at all levels of Nature we could treat all differences as due simply to differences of arrangement and motion of the ultimate, homogeneous particles, we are compelled at present rather to acknowledge something like qualitative breaks, or novelties, from level to level. Taking the sciences in ascending order, we find that ever fresh independent variables—now characters of elements, now characters of groups or compounds or systems of elements—are introduced into our laws, and that the laws of a higher stage cannot be reduced to, or predicted from, or treated as particular cases of, the more general laws of

a lower stage. If this is the actual situation, it explains why scientists, whatever their programmatic professions, do not actually work with the theory of pure mechanism. In this connexion, too, it is worth remembering that no mechanical explanation ever employs nothing but the " laws of motion." For, by themselves, these are purely regulative, somewhat like the laws of logic. They define the limits within which all possible motions fall, but they do not determine *that* any particular motion happens, or *when*, or in detail the *way in which* one motion will cause other motions. For all this we need further data, and these may be of various sorts, chemical, thermal, magnetic, electric, etc.

Thus, when we are sent to " mechanism," we find no simple or single theory. The atomic theory in chemistry, for example, in so far as it assumes different kinds of atoms and does not assume that the interactions of atoms can be formulated in terms of the laws of motion, is not strictly mechanical, for all that its atoms are " microscopic." In fact, mechanistic biologists, like Loeb, are content to claim that they have found a " mechanistic " explanation, either (*a*) when they have discovered a quantitative correlation between two phenomena (e.g., when the behaviour of heliotropic animals conforms to the Roscoe-Bunsen law for photochemical reactions) ; or (*b*) when they have produced

a vital phenomenon by non-vital means (e.g., when the egg of a sea-urchin is stimulated into development, not by a spermatozöon, but by the prick of a needle). A mechanism so mild that it is content with the discovery of quantitative correlations, can hardly be said any longer to exclude or forbid the recognition of yet higher laws, though the terms of which these laws affirm the correlation may no longer permit measurement.

Before we close this examination of mechanism, we may just in a word remind ourselves that, so far as the traditional microscopic mechanism involves the " bifurcation of Nature " and the depreciation of colours, sounds, etc., to mere impressions in an observer's mind, these macroscopic appearances do not in any real sense receive a " mechanical " explanation, nor is the action of matter on mind by which these impressions are supposed to be produced, in any intelligible sense a " mechanical " action.

Thus mechanism, closely inspected, turns out to be full of ambiguity and, at critical points, full, too, of incoherence. The use which has sometimes been made of it in argument has been sheer bluff. Its main value, we repeat, is negative, not positive. Only its mildest forms are actually used by biologists, and so far from being a complete explanatory theory of all vital phenomena, mechanism is

really little more than a proclamation of the right, and the will, to apply all the resources of physical and chemical experimentation to the study of the facts of life. But this programme obviously cannot be twisted into an injunction against the recognition, in biology, of laws the terms and relations of which are not of the physico-chemical order at all. In short, mechanism may play its part among the tools of the biologist without destroying the autonomy of biology as a science. Huxley, with that vividness of phrase of which he was a master, once summed up an organism as " nothing but the constant form of a turmoil of material molecules." Stripping the phrase of its metaphor, let us grant whatever truth it may seem to us to possess, but then let us reflect how far it is from describing, or making intelligible, the dominant character of life as exhibited in the observable behaviour of living beings.

5. It is one thing, however, to criticize the mechanical theory of Nature and to point out that, at best, it covers only the lower levels in the hierarchy of Nature's laws, and that this limitation comes more and more fully into view in proportion as we turn our attention to the higher forms of life in animal and man. It is another thing to decide what concepts are needed to supplement it. Our next task, therefore, is to pass in review, very briefly, a number of contemporary tendencies of thought

which have at least this in common :—they seek in one way or another to express the fact that our experience of living beings, and of our dealings with them, leaves upon us a peculiar and distinctive impression of life as a unique and, as such, not further analyzable quality or character, or, as Whitehead has it, " rhythm " and " pattern." The difference between what is living and what is dead, what is inorganic and inanimate and what is organic and alive, is the fundamental datum of observation upon which biology is built up. Hence, as J. S. Haldane points out, " in dealing with life we not only use a whole series of special terms, but these terms appear to belong to a specific general conception which is never made use of in the physical sciences." We may illustrate this for ourselves by reflecting that when we study living beings as physico-chemical machines, their character as *living* is simply irrelevant. So far from being explained, it is rather ignored. It is not part of the physicist's or chemist's universe of discourse. The very term " organic," which a biologist uses only of what is living, has lost in the chemist's mouth all reference to the living. Organic chemistry is simply the chemistry of carbon-compounds, regardless of whether they are found or produced in the living or in the non-living.

The concept of life, then, is a distinctive concept,

of a different order from physical or chemical concepts, and not reducible to them by analysis. Life is *sui generis*, qualitatively unique. And the concept of life is derived from our experience of living beings, and has in that experience its observational root and datum. A living being is an object perceptible by the senses, but an object which in structure, behaviour, intercourse with its environment, makes upon us a unique total impression which we signalize by the terms life, living, alive, and seek to express more in detail by describing a living being as " an active autonomous whole " (J. S. Haldane and others), or by speaking, with J. A. Thomson, of " an insurgent self-assertiveness," and even of " an endeavour after well-being " observable in living creatures. The proverbial " will to live " and Bergson's *élan vital* are more generalized terms for the same impression.

We said just now " observable." But our right to use this term will be challenged. We shall be told that the deliverance of our senses includes nothing so psychological as will, endeavour, self-assertion, or even autonomous activity. The most which the critics will allow to be observable by the senses is motion—bodily movement, change of place, change of state. They will boggle even at Whitehead's rhythm and pattern. Very well, let us humour the critics, and, lest we quarrel merely about

words, concede that " observation " is limited as they suggest. Let us say that we know life, when we meet it, by " interpretation," or, with a learned flavour, by " empathy " (*Einfühlung*). If we were not alive ourselves, if we did not know life (know what it feels like, so to speak) by living, we should hardly recognize it in the world about us. Interpretation or empathy just express that certain objects of perception by their structure and behaviour—or, if the critics insist, by their composition and movement—elicit from us a certain response or attitude, which is an essential ingredient in our way of perceiving or apprehending them, and which involves *feeling* and acting as well as perceiving. In evoking this peculiarly complex experience on our part, the life which confronts us reveals itself to us. As J. S. Haldane quaintly but accurately puts it, " a biologist feels it in his very bones " that he is dealing with *living* structure and *living* activity. This interpretative manner of perceiving is no more infallible than any other ; perhaps rather less so. We certainly learn by experience, i.e., by trial and error, the limits within which objects both demand and permit this manner of apprehending them. We may use it on occasions when it should not be used and fail to use it when we should ; in other words, we may feel and behave and talk as if there were life when there is none, and fail to

recognize it when it is present. But experience here, as elsewhere, makes expert and supplies its own correctives.

At any rate, the point we have to note is that all biologists who regard mechanistic concepts as inadequate for the analysis of life, do in effect assert that life is unique and *sui generis*, and that we need a special language and special concepts to express our experience of it.

Let us illustrate this, and at the same time comment on the strength or weakness of the resulting theory, by taking the views of Hans Driesch, Henri Bergson, and J. S. Haldane.

For Driesch, the empirical datum is the " factual wholeness " of an organism, as " a type of manifoldness which is at the same time a unity," not merely in form, but in function, i.e., in what it does. It grows, it repairs itself, it adapts itself, and in these and other " teleological " processes builds up, restores, maintains its factual wholeness. Moreover, many of the activities of an organism have an historical quality. An organism does not merely repeat its movements like a machine, but, within wider or narrower limits, learns to modify them by repetition so as to correspond more closely to varying stimuli. No machine, so Driesch holds, can do any of these things, and therefore no mechanistic, i.e., physico-chemical, explanation of them is

possible. Hence, we must postulate an imperceptible factor of a different order which Driesch, borrowing an Aristotelian term, calls an "entelechy." With this empirical, or inductive, argument Driesch couples a speculative logical argument which is built on the principle that there cannot be more in the effect than there is in the cause. Now, in the growth of an organism there is a visible increase in complexity or manifoldness, from which Driesch infers, with the help of the principle just stated, that the cause, i.e., the visible starting-point of growth (such as a fertilized ovum), must involve an imperceptible factor or agent to which the building up of the complex organism is due. This agent is the entelechy. It is not conceived by Driesch as a conscious mind, but neither, on the other hand, is it a physical thing. It is something intermediate between these, and produces its effects by controlling and directing the physico-chemical processes, now suspending, now releasing them.

This particular way of dealing with the unique character of life has found no favour with biologists at large, not even with those who share Driesch's conviction of the insufficiency of the mechanistic theory. In truth, an entelechy is too hypothetical a creature to command conviction. It is too obviously a stop-gap invented *ad hoc*. Driesch's arguments consist in pointing out lacunae in

the mechanistic account and then invoking the entelechy to fill them. At the same time, the hypothesis of entelechies is weak just where the mechanistic theory is strongest. The latter has been immensely fertile in suggesting problems for experimental research, whereas the vitalistic hypothesis has been barren in this respect. In fact, the vitalistic hypothesis cannot be strictly either verified or disproved by experiment. Its " verification," if we are to call it so, consists in its being invoked at all the points at which mechanism is said to fail. But we cannot well blame mechanists for regarding it as a mere symbol of ignorance, and for hoping that further research will discover mechanistic explanations for the processes which Driesch ascribes to the activity of entelechies.

The fact is that Driesch's entelechy is a product of the same vice of " bifurcation " which, as we saw in the last lecture, has also produced the traditional theory of " matter." Instead of deriving the concept of life from the facts of life as experienced by us, he postulates an imperceptible agent as the hypothetical *cause* of these facts. The philosophical nakedness of this device is but thinly disguised by the venerable title " entelechy."

But, among the empirical characters of life emphasized by Driesch there is one which connects

his theory with Bergson's, viz., the "historical" character of vital activity, its plasticity through memory (so to speak). In an older generation, Semon, Hering, and Samuel Butler had already made attempts to follow up this clue and make it available for precise theory. It leads to such suggestions as that the "mechanical" routine of physico-chemical processes is akin to habits, now fixed by age-long repetition, but once formed by living endeavour and experiment. The most familiar version of this view at the present day is Bergson's theory of "matter" as the deposit of the *élan vital* in its slackening, and of "real time," or "duration," as the way in which the *élan vital*, enriched by its whole past, creates unceasingly unpredictable novelties. Biologists who take a philosophical interest in their subject cannot afford to ignore these theories wholly, for they serve to bring vividly before our minds a character of life which else we are apt to ignore—its resourcefulness and fertility of invention. But even non-mechanistic biologists have so far been unable to make much positive use of Bergson's concepts, probably because they are, as Bergson frankly acknowledges them to be, of the *psychological* order and thus make consciousness, or some analogon of consciousness, coextensive, or even identical, with life. This is a step which most biologists are

not prepared to take. Their topic is life, not mind.

The position of those who " see no use for the hypothesis that life as a whole is a mechanical process," is perhaps best represented by the writings of Professors J. A. Thomson and J. S. Haldane, the latter of whom goes so far as to say that the mechanistic theory seems to him to be a serious hindrance to the progress of biology. More clearly than any other biologists these two scientists affirm that biology rests on the concept of life, that we have been led to this concept by our experience of life, and that only in subordination to this concept does physico-chemical knowledge become relevant in the study of living beings. Thus J. S. Haldane writes : " The bodily processes—for instance, the apparent mechanical or chemical processes of movement of the limbs, of breathing, of circulation, of digestive changes, of the taking up and giving off of various forms of matter and energy—become nothing but the expression of organic activity. Their maintenance and working during life are only phases of the organic determination which is the key to all the phenomena of life. They must be looked at from the physiological or biological standpoint, and not merely from that of the physical sciences."

And Thomson places the same point of view in a wider synoptic context, in his *System of Animate*

Nature, by surveying the whole "web of life" and invoking all sides of our experience of the spectacle of life in its natural setting, including its appeal to our sense of beauty and to religious emotion.

But both these biologists are also philosophers, and this, no doubt, explains why they do not close their minds to the wider outlook, and why their biological theory is capable of forming part of a synoptic philosophy.

6. So far we have avoided the mention of one concept which holds a time-honoured place in all discussions of life. It remains for us to consider briefly what recent thought has contributed to the elucidation of *teleology* in nature.

The endeavour to explain living beings by the application to them of the concept of purpose or design reaches back almost as far as philosophy itself. The striking form and organization of living beings, their behaviour directed towards their own preservation and welfare, their fitness for their environment and their environment's fitness for them—all these topics have been elaborated in infinite detail as evidences of intelligent and benevolent design. But design implies a designer. Where shall we look for the designing mind and will? Two possibilities only seem open. We must attribute the guidance and purpose either

to the mind of the living organism itself, or else we must refer the whole system of Nature with all the manifold life in it to the design of a divine creator. On the former view, consciousness must be supposed to be coextensive with the realm of living beings; indeed every living thing must not only have a mind, but a mind sufficiently developed to know in anticipation what it wants. This requires foresight; and foresight, in turn, requires, if not constructive reasoning, at least memory—the recollection of what in previous experience has followed from similar situations. But to distribute mentality of this high order—and nothing less will really do the work of intelligent guidance—throughout the whole realm of life is a speculative venture which has, indeed, been made by such eminent thinkers as Samuel Butler and James Ward, but against which there are at least two strong arguments. The first is that the hypothesis by far outruns the evidence, even in animals, let alone in plants. The other is that in man, where intelligent control *is* a factor, a great part of the routine of life is carried on "automatically"—often without consciousness of what is going on, and certainly without explicit purpose. Neither of these arguments is, indeed, absolutely conclusive, but together they form a strong presumption against the hypothesis that the organization and behaviour

of a living being are due to its own thought and will. " The orchid could have no mind that could contrive its fertilization, any more than man has a mind which could teach him to swallow or digest, or could choose the place or century of his birth " (Bosanquet). Samuel Butler suggests that for automatic performances no conscious purpose is needed, because the living creature knows so well how to do them, having practised them an untold number of times in successive incarnations. But it is impossible to imagine how the process of acquiring the automatic routine or skill should ever have got started without an already existing basis of physical organization, and the argument about choice of time and place of birth is not met at all. Bergson, clearly, takes a safer line in excluding " finalism," i.e., conscious purpose, altogether from life, even when it is most creative.

The other view, postulating a divine designer and creator, has shared with other theological concepts the fate of elimination from science. The contest between it and " mechanism " has ended with the definite victory of the latter. The famous *Bridgewater Treatises* are the last example (on a comprehensive scale) of the attempt to exhibit in detail the goodness, power, and wisdom of God as manifested in natural creation. There is no need to recapitulate the fluctuating fortunes of this

debate, from Bacon's epigram about the barrenness of final causes, which inspired Cowley, in his ode to the Royal Society, to write " Bacon has broke that scar-crow Deity," to Paley's *Evidences*; from Newton's acceptance of the argument for design to Laplace's " I have no need of that hypothesis."[1] From the judgment-seat of philosophy first Hume, and next, with greater force and finality, Kant, pronounced the verdict against the " physico-theological " argument for the existence of God. Science no longer looks for evidences of God's design, nor is it satisfied to explain any given phenomenon by saying that it is " best " so, and that God willed it for this reason.

[1] The teleological argument has been made ridiculous largely by its own extravagances. As Spinoza suggests, it tempts the lazy and ignorant to substitute a facile reference to God's presumed purposes for the patient exploration of the actual and necessary nexus of facts. Theology cannot do the work of natural science, and should not be substituted for it. But after science has done its work by its own methods, is there not room for recognizing that Nature evokes the religious experience, too? And is there not a problem here for synopsis? A passion for knowledge and for truth is not incompatible with worship, and it seems clear that for a man like Newton the traditional metaphor of divine design expressed the very genuine experience of the way in which every fresh insight into the order of Nature accorded with, and heightened, his religious response. It is worth recalling, too, as one of the curiosities of this debate, that many thinkers originally adopted the mechanical theory precisely because it seemed to facilitate the argument for design. To call anything a " machine " *ipso facto* implied a maker whose knowledge and power were commensurate with the scale and intricacy of his work. The cosmos as a machine required nothing less than God as its author. From this crudely anthropomorphic argument Hume and Kant have delivered us.

But the acceptance of this result has given rise to two fresh problems. It has set us seeking, first, for a new and deeper interpretation of the relation of natural science to religion; and, secondly, for a way of dealing in science with those facts and relationships which the teleological argument had interpreted as evidences of intelligent purpose. To the former problem we shall return in Lecture V. To the latter Professor L. J. Henderson has recently made a remarkable contribution, which we must now consider.

The line of investigation which Henderson has pursued in his two books on *The Fitness of the Environment* and on *The Order of Nature*, may be summarized as follows. Two aspects of Nature have impressed themselves upon the inquiring mind. One is the determination of phenomena according to causal law, which has been elaborated into the mechanical theory of Nature. The other is the existence of living organisms, whose structure, behaviour, and relation to their environment have seemed to demand, almost irresistibly, an explanation in terms of purpose and design. This "teleological appearance" cannot be denied or argued away. Yet, what can science do to make it intelligible? The mechanical theory throws no light on the matter: for it, the teleological appearance is an "accident." On the other hand, neither

theology with its concept of design, nor psychology with its concept of animal or human intelligence, nor vitalism, be it of Bergson's kind or of Driesch's, can fill the gap. The way out of this impasse which Henderson explores is that science has overlooked an order among the properties of the constituent elements of Nature, and among their laws, uniquely adapted to the needs of life. This order or "pattern" is missed when Nature is considered statically, or, rather, unhistorically. But, it comes into view when history, i.e., evolution, is taken into account, or, in other words, when we consider the physico-chemical constitution of Nature in the light of the fact that living beings have evolved on the basis of it. Organisms are individuals, i.e., stable, durable systems maintaining their equilibrium (or self-identity) in the flux of physico-chemical processes. Hume was the first to perceive this problem, viz., how to account for that "economy of Nature" which explains the constancy of organic forms in a world of matter in motion. But Hume's suggestion was too far in advance of the science of his time, and it was forgotten. It needed the concurrent development of physics, chemistry, and biology during the nineteenth century to enable scientists to recognize that living beings are systems functioning according to a pattern of their own, and that their existence

points to a specific pattern or order in the constitution of Nature. The clue, so Henderson claims, is to be found in the thermodynamic researches of Willard Gibbs, culminating in the rigorous statement of the concept of a physico-chemical *system.* " Just as Newton first conclusively showed that this is a world of masses, so Willard Gibbs first revealed it as a world of systems." Organisms are systems the formation and stability of which we can now correlate definitely with a unique pattern in the environment. For, by far the most abundant chemical elements in the environment of life are hydrogen, oxygen and carbon. These are also the most active elements, give rise to the most numerous compounds, form the most complex molecular structures, yield the most energy in their mutual transformations. In all these ways, they make the actual environment the fittest possible for life. If, for example, water, carbonic acid, and the carbohydrates did not play the part in the economy of Nature which we find them playing, life as we know it would be impossible. Yet this ensemble of properties is so infinitely improbable when considered as the result of mere chance, that we can make it intelligible to ourselves only by regarding it as a " preparation " for life.

The term " preparation," thus, sums up Henderson's recognition of a teleological pattern

in Nature. It is his substitute for "design." In fact, when we compare his *Order of Nature* with, say, Prout's volume in the *Bridgewater Treatises*, we perceive that his argument is in principle that of the *Bridgewater Treatises*—but with the science brought up-to-date and with God left out.

The significance of such a view for a synoptic philosophy lies in the suggestion that the teleological character of life is deeply rooted in the physico-chemical, or "mechanical," constitution of Nature. It is neither an accident, nor a miracle. And, what is thus true of life may be true of those other appearances which commonly rank as teleological—the beauty of natural objects which is revealed to the artist and the perfection to which religious feeling responds in worship. As Bosanquet reminds us, the beauty of a flower, the curl of a wave, the form of a precipice are appearances as deeply rooted in the ultimate data and laws of Nature as the motion of the solar system or the formation of a chemical compound. They are neither an "accidental by-product of the interaction of elements in whose nature and general laws of combination no such result is immanent," nor are they *ab extra* superinduced upon Nature by the operation of a mind working on the analogy of a human artist. "We must interpret the nature of Nature as much by the flower as by the law of

gravitation." In other words, we need the synoptic use of all the resources of our experience.

BIBLIOGRAPHY

1. Merz, J. T. *A History of European Thought in the Nineteenth Century.* (W. Blackwood & Sons.)
2. Loeb, Jacques *The Dynamics of Living Matter.* (Macmillan & Co., 1910.)
3. Loeb, Jacques *The Organism as a Whole.* (G. P. Putnam's Sons, 1919.)
4. Loeb, Jacques "Forced Movements, Tropisms, and Animal Conduct." Vol. I of *Monographs on Experimental Biology.* (Philadelphia and London: J. B. Lippincott & Co., 1920.)
5. Driesch, Hans *The Science and Philosophy of the Organism,* 2 vols. (A. & C. Black, 1907, 1908.)
6. Driesch, Hans *The Problem of Individuality* (Macmillan & Co., 1914.)
7. Bergson, H. *Creative Evolution,* tr. A. Mitchell. (Macmillan & Co., 1914.)
8. Butler, Samuel *Life and Habit.* (A. C. Fifield, 1916.)
9. Darbishire, A. D. *An Introduction to Biology.* (Cassell & Co., 1917.)
10. Ward, James *The Realm of Ends.* (Camb. Univ. Press, 1911.)
11. Haldane, J. S. *Mechanism, Life and Personality.* (John Murray, 1913.)
12. Thomson, J. Arthur *The System of Animate Nature.* (Williams & Norgate, 1920.)
13. Henderson, L. J. *The Fitness of the Environment.* (Macmillan & Co., 1913.)
14. Henderson, L. J. *The Order of Nature.* (Harvard Univ. Press, 1917.)
15. Bosanquet, B. "The Meaning of Teleology." (Reprint from *Proceedings of the British Academy,* Vol. II, London: Henry Froude, 1906.)
16. Broad, C. D. "Mechanical Explanation and its Alternatives." (*Proceedings of the Aristotelian Society,* Vol. XIX.)

17. Hoernlé, R. F. A. *Studies in Contemporary Metaphysics.* (New York: Harcourt, Brace & Co.; London: Kegan Paul, 1920.)

In this list mechanism is represented in an extreme, but typical form by Loeb (Nos. 2, 3, 4), vitalism by Driesch (Nos. 5, 6), Bergson (No. 7) and Butler (No. 8). Butler's *Evolution, Old and New* (A. C. Fifield, 1916), too, is worth consulting. Another variant of the argument which traces mechanism back to purposive intelligence is to be found in No. 10; cf. also Ward's Henry Sidgwick Memorial Lecture on *Heredity and Memory* (Camb. Univ. Press, 1913). Darbishire (No. 9) illustrates what use an experimental biologist claims to be able to make of Bergson's and Butler's points of view. Haldane (No. 11) and Thomson (Nov. 12) represent the attempt to overcome the antithesis of mechanism and vitalism by studying life as an "appearance" (i.e. as something definitely appearing or revealing itself to empirical observation), which is neither to be referred to an hypothetical factor or impulse, nor to be treated as mental or conscious. Henderson (Nos. 13, 14) tries to give a meaning to teleology in science as recognition of a definite physico-chemical pattern in nature, favourable to life. The history of the controversy between vitalism and mechanism in the nineteenth century may be studied in Merz (No 1). Bosanquet's paper (No. 15) is the best treatment of teleology from the point of view of an idealist metaphysician; cf. also his *Principle of Individuality and Value,* Lecture IV. Broad's paper (No. 16) is the best critical examination of mechanism. The argument in section 4 of the Lecture is mainly based on it. Both Nos. 15 and 16 should be carefully studied by everyone interested in the philosophical criticism of scientific concepts and methods. A further discussion of the topic of the Lecture by the Lecturer will be found in No. 17, chs. vi and vii.—Among the older literature, Robert Boyle's *Disquisition about the Final Causes of Things,* London, 1688, is still worth reading; it shows the emancipation of scientific method from theology in the making.

LECTURE IV

THE NATURE AND FUNCTION OF MIND

1. IN the last lecture we had found ourselves trembling more than once on the very threshold of "mind." It is not easy, as we saw, for biology to vindicate for itself a place as an autonomous science between physics and chemistry on the one side, and psychology on the other. Biological thinking is pulled in opposite directions. One party tries to make biology nothing but a branch of physics and chemistry; the other relies on analogy in an effort to extend psychological concepts over the whole field of the living. Between these two extremes, a middle party, embarrassed by a "vitalistic" left wing, tries to hold to "life" as a fact in the order of nature and of evolution, which is more than "matter" and less than "mind." True, we can hardly deny minds to the higher animals, and still less to *homo sapiens*, but to attribute minds to lower animals becomes an increasingly precarious procedure. And what of

plants? Sir Jagadis Chunder Bose has shown experimentally that plants exhibit in their responses to stimuli a sensitiveness and irritability which we can readily parallel with similar responses in animals. Again, the "tropisms" of plants have so close a counterpart in certain features of animal behaviour, that Loeb can in all seriousness formulate the programme of reducing even the highest activities of men, via the instinctive behaviour of animals and the tropisms of plants, to purely physico-chemical reactions. But what are we to make of these affinities? The appeal to continuity cuts both ways. If the pull of the argument is, in one direction, back to matter and mechanism, it is also, in the other direction, forward to mind. It is just as easy to postulate—and it is constantly being done—that mind cannot have evolved out of the non-mental, or life out of the non-living, as it is easy to assert that what is once physico-chemical is always physico-chemical and never anything but physico-chemical. But, as we saw in the last lecture, if we take evolution seriously, we must expect to find discontinuity as well as continuity, the emergence of qualitatively new appearances in the world, as well as the persistence of the old. Where to draw the line, may often be difficult to say. The exercise of good judgment in difficult border-line cases requires a

quality akin to tact—an expertness only to be gained by long and close familiarity with the facts. Biologists appear to be able to get on without feeling the need to attribute minds to living cells, or to plants. But no less clearly are they compelled to recognize minds in human beings and many of the other higher animals. So sound an observer as Jennings regards even the behaviour of protozoa as being of the psychological order. The presence or absence of a central nervous system furnishes an additional test, for it seems reasonable to assume that the formation of so distinctive a structure is the basis for the emergence of the new quality or power which we call " mind." However, with the problem where to draw the line we are not concerned. It is enough for us if the occurrence of mind is granted. At least, except by way of abuse, we shall not deny the presence of mind in each other.

And so it is now our task to review the tendencies in contemporary psychology in order to discover what they may hold of promise for our synoptic programme.

2. What sort of a thing is a " mind " ? No question seemingly could be simpler to answer. We all have minds, we all use them (more or less) ; indeed, to put it more strongly still, we all *are* minds. If each of us has that most intimate acquaintance

with what a mind is which comes from being a mind, where is the difficulty? Yet this innocent question confounds all the experts. It is a somewhat humiliating confession to make, but it cannot be avoided: psychology at the present day has no single, straightforward answer to give. There are different schools of psychology which are more or less at war with each other about the fundamental principles of their science, and hence about the very language in which we are to speak about the mind. An unsettled terminology is a sure symptom of unsettled thinking, and every candid psychologist will have to admit, what kindly critics do not tire from pointing out, that psychology as a whole presents a spectacle of chaos and confusion. It is like a patient in a critical condition, with a multitude of doctors disagreeing on diagnosis and treatment. This is not to deny that vigorous research and consequent development of theory are constantly going on in many directions. From psychical research to psycho-analysis, from animal to human, from physiological and experimental to introspective psychology, from the psychology of industry or of crime to the psychology of æsthetic or of religious experience, there is no lack of activity. But the trouble is that the outcome of all this activity does but make the confusion worse confounded.

There are many reasons, as we shall presently see more in detail, for this state of things, but the most fundamental reason of all may be suggested at once. Indeed, we shall do well to bear it in mind throughout this lecture, for it contains both the problem and the promise of a synoptic treatment.

This fundamental reason is that *mind is manifestly a quality or power which admits of infinite degrees and variations*. As we watch the animal world around us, nay, as we watch ourselves, we find here more, there less, of mind. In the individual, mind develops and increases and, again, it degenerates and shrinks. Indeed, it fluctuates within varying limits in every one of us in the course of every twenty-four hours. To catch anything so mobile, so tidal in its energies, so manifold in its forms, in the comparatively rigid network of a theory is no easy task. And we can easily understand how it is that different students, concentrating upon some of the facts of mind and forgetting others, have framed different concepts and used apparently incompatible languages. Yet the broad fact which we have just pointed out is nothing recondite or technical. On the contrary, it is the most familiar fact of everyday experience, constantly acknowledged by us in practice and in many a current turn of speech. In countless ways, we are constantly comparing minds, and thereby

treating them as something of which there can be *more or less*. Minds differ in range, in depth, in organization, in intelligence, in will-power ; in fact, in every property which can be predicated of a mind. In current judgments on each other, and by special tests like intelligence-tests, we are always comparing and sorting and grading minds. We recognize special aptitudes which some minds possess and others lack, e.g., for music, or for mathematics, or for the leadership of men, and which the minds that possess them have in all sorts of degrees and nuances. We know that minds differ in range—a child's from an adult's, one adult's from another's, an animal's from a man's. Each profession has its characteristic type of mind, and different types will deal differently with the same situation, e.g., a lawyer and a scientist, a business-man and an artist.[1] In old age, mind tends gradually to fail, but there are oscillations in range and power throughout an individual's life, and even within a day his mind waxes and wanes in energy : it is not always at its best, nor, indeed, always active at all. The same fact can be brought out even more strikingly by turning to

[1] Consider, e.g., the current attitude of the technical expert to the politician. The books on the war, and on the making of the peace, abound in examples of conflicts of different types of mind. See the contrast of Wilson's professorial and Lansing's legal mind in the latter's *The Peace Negotiations : A Personal Narrative*. (Constable, 1921.)

what is the crux of the mind, viz., consciousness. There is, surely, no denying that there are degrees and fluctuations of consciousness. To be conscious, so it is commonly held, is to feel, to will, to think. But these are blanket-terms. Feeling covers experiences as various as pleasure and pain (or "displeasure," as some psychologists prefer to say in order to distinguish the feeling from the sensation of pain), and all the emotions, simple or complex. Willing covers desire, wish, impulse—in short, every form of conation or striving. Thinking covers sensing, perceiving, imagining, reasoning, and many more. Clearly all these, which together make up "consciousness," occur in all sorts of degrees and variations in different creatures, and in the same creature at different times. They all admit of more or less. Moreover—and this is perhaps the most important point of all—it does not avail us much to classify the contents or processes of consciousness under these three heads of feeling, willing, thinking, unless we go on to consider *what* a given mind, or type of mind, feels, wills, thinks. The truly important differences between minds in range, organization, power, do not emerge until we throw the emphasis on *what* it is that they feel, will, think. This gives us the *world* of each mind, or better still, *each mind as a world*, a microcosm, a cross-section of the universe,

as such constantly expanding and shrinking; growing and failing; retaining old, absorbing new, experiences; at its best transforming itself, and its world, by an activity which is *both creative and logical.* But to say this is to anticipate our conclusion, viz., the direction in which a synoptic theory of mind promises to move. So far we have not given a theory, but merely reminded ourselves of a fact by which we can measure the adequacy of the theories which are currently offered.

3. Apart from the fundamental difficulty which we have just pointed out, the chaos in modern psychology is due to special causes which we may conveniently divide into two groups.

One group consists of difficulties due to the ramifications of psychological research at the present day. Specialization, here as elsewhere, has meant divergence, and in diverging the workers in psychology have lost touch with each other and with the unity of their topic. Moreover, coming into contact, along their different lines of work, with different theoretical influences from other sources, from physics, or biology, or philosophy, or religion, or medicine, they have almost forgotten how to speak a common language or how to understand each other. The psychologists of the laboratory and of the market-place have gone their different ways, and sometimes seem even resentful of the

synoptic philosopher's attempt to bring them together again.

And, secondly, this centrifugal tendency has been intensified by the past history of psychology which, culminating in the discovery of "consciousness," has embarrassed us with the dualism of matter and mind, or body and soul—perhaps the most formidable obstacle to synopsis in the whole welter of modern theories.

Let us glance at each of these special sources of difficulty in turn, beginning with the first-mentioned, viz., the divergences of present-day psychological research. Under this heading, four points deserve our notice.

(*a*) There is considerable disagreement about the range of facts which "scientific" psychology should include. Most psychologists fight shy of the whole realm of psychical research. Now, granted that spiritualism is a field in which deceit and trickery are rampant, and fraudulent mediums too often exploit the will to believe of an ignorant public, yet, after all deductions, there would seem to remain a very substantial residue of phenomena the genuineness of which is sufficiently well attested to justify the attempt to investigate them further, and more especially to bring them under experimental control, so that the conditions of their occurrence may be determined. Whether among

the various kinds of mediumistic phenomena we attach the greater importance to the alleged communications from departed spirits and the implied evidence for survival of death, or to such feats of materialization as the late Mr. W. J. Crawford has been investigating with the help of photography and experimental apparatus, in either case there can be no doubt that our current theories of what a mind is and what it can do would require extensive remodelling, if these groups of phenomena were once accepted as well-established.—In another direction, orthodox psychology tends to look askance at investigations which claim for animals a greater degree of intelligence than we commonly concede to them. The " Kluge Hans," and other horses, after having been investigated by several commissions of experts, appear to have had the claims to well-nigh human intelligence, which were made for them by their owners and trainers, disallowed. But experiments in developing the minds of animals have not ceased. Dogs have been taught to express themselves in a semi-phonetic alphabet, in which each sound is represented by a fixed number of taps with the paw. Cases are reported of their using this language for the spontaneous communication of their experiences, and in Germany the *Letters and Reminiscences* of the dog " Rolf " have actually been published in an *édition de luxe*.

Should these stories be authenticated, they will at least warn us not to set dogmatic limits to the powers of an animal mind.

(*b*) A second source of trouble is the disagreement about methods and principles. Psychologists who seek to frame all explanations in physiological terms are confronted by others who hold that mind is *sui generis* and must be described in its own terms; and there is a middle party which muddles through somehow on a mixed intellectual diet of bits of physiology and bits of psychology. Behind these differences there looms the time-honoured problem of the relation of body to mind. Are they different entities or "substances"? If so, can they exist apart? And how are they connected so as to co-operate? For, a mind-body creature somehow acts as a whole, as if it were all of one piece, so to speak, not a compound of heterogeneous substances mysteriously coupled together.—In another direction, students of human minds and students of animal minds are driven apart by the fact that human beings can make objects of their own minds, whereas animals, apparently, cannot. Or, at least, the power of self-objectification is useless to the psychologist without communication by language. In animal psychology, therefore, we are in the position of external spectators, and at once the question arises whether we can really observe

the animal's mind at all. The animal's behaviour —yes, but its mind? We can watch what its body does, but can we know what goes on "inside" its mind? If we say, "Yes, we can, viz., by inference or interpretation," the question becomes, Have we good grounds for such inference? Will it not be safer and more scientific to stick to what we can observe, and, avoiding hypotheses which we cannot check, to frame our explanations in terms capable of being tested by observation? That way lies "behaviourism." But, at least, it may be urged, we know our own minds from inside. Yes, each perhaps his own mind; but his neighbour's? Are we not towards each other in the same position of external spectators of behaviour in which we stand towards animals? Self-objectification, then, or "introspection," might possibly furnish auto-biographies, but will these furnish a science of mind as such? True, there is language: we can tell one another what is going on in our own minds, and this does modify very profoundly our relation towards each other even as external observers. For, speaking is not merely behaviour but *expressive* behaviour. The words have a meaning because they express a feeling or act of thought or of will, in short an experience, a bit of the life of a mind. We understand another's language by taking his words to express what we should express in the

same words. It follows that language makes a very profound difference even to introspection, for it breaches that *privacy* of introspection which, at first sight, threatens to make introspection so utterly useless an instrument for psychology. For, what would it avail the psychologist, if his field of investigation were narrowed down inexorably to his own mind, when his aim is to achieve a theory of mind as such, and to discover laws which will be true for other minds no less than for his own? Now, introspection or self-observation yields theory only so far as the facts it discovers are put into words; but whence does the psychologist take his words except from the common stock of language, fashioned, ready for his use, by the self-expression of other minds? Yet, if this reflexion disposes of the difficulty of privacy, it does not release us from all our troubles. The language of introspective analysis and the language of external observation require to be harmonized, for even where the vocabulary is the same, the meaning may be different. The statement, for example, that an animal hears a sound may mean, in terms of what an observer can perceive, that the animal "responds to an auditory stimulus," i.e., that it pricks its ears, looks around, gets ready to fly or fight or catch a prey, etc. In introspective terms, on the other hand, it will mean that a sound (an "auditory

sensation ") occurs in the animal's " stream of consciousness " and receives attention. Whilst some psychologists are doing their best to synthesize these two languages, others (the " behaviourists ") are striving to force them apart, with the professed aim of eliminating the introspective method and its language altogether from psychology. As long as psychologists thus pull in opposite directions, confusion cannot but continue to reign in their science.

(*c*) A third source of trouble, closely connected with the preceding, is that language is used by a speaker to express what he is conscious of. But is " consciousness " co-extensive with " mind " ? Are the two words synonymous ? There is a tendency so to treat them, especially among introspective psychologists. Introspection is said to bring to attention and make accessible to analysis " what goes on in consciousness." The well-known definition of mind as the " stream of consciousness " is typical of this line of psychology. Of course, over and above the processes which introspection discovers going on in the mind, the introspective psychologist must assume also a *structure* of mind. He will be found talking of " mental dispositions " and of " laws " of mental process, in short, of uniformities which, though revealed by his analysis, are not part of " consciousness " in the sense in

which it is the datum for introspection. But to explain consciousness by reference to " unconscious " dispositions and laws is one thing; it is quite another thing to assume unconscious processes to be going on all the time in the mind, and this is the hypothesis which another school of psychologists regards as indispensable. On this view, consciousness is but the apex, as it were, of the mind—its luminous peak; and the bulk of the mind extends " below the threshold " of consciousness, just as the bulk of an iceberg is below the surface of the water. Thence it is but a step to the hypothesis that the moving forces are mainly, or even wholly, down there, out of sight as it were. Consciousness, then, becomes a sort of stage, the marionettes on which are being pulled by invisible strings from an underworld of sub-conscious or unconscious mental factors. In this sense Professor G. Stanley Hall once asserted in a lecture that " consciousness never says what it means." Whatever goes on in consciousness will thus be symbolic of the play of forces which never appear *in propria persona*, but only in disguises more or less complete. This view, of course, is extreme, yet recent psychoanalysis—itself already split into several more or less hostile schools—certainly throws the emphasis in the study of mind on to that portion of mind which lies below consciousness. It offers an in-

creasingly elaborate account of the layers or strata there to be found, and of the mechanism or structure by which the processes in consciousness are determined, as when a dream is analyzed as the fulfilment in imagination of a repressed wish, or a slip of the tongue as a betrayal of a similar repression. On the other hand, however, the whole technique of psycho-analysis depends on identifying the constituents of the unconscious realm by dragging them into consciousness. It is, apparently, only through consciousness that the unconscious can be studied, and the various methods employed have the common aim of locating and breaking down the resistances which prevent the unconscious factors from emerging in their own true character. The curative effect of psycho-analysis seems to depend wholly on the extent to which the repressed memories or wishes, which cause morbid disturbances of consciousness, can be brought into the light of consciousness so that rational self-control may be regained. Hypnotism, as employed in psychiatry, has the same purpose, viz., to explore what is normally hidden in the unconscious, by letting it come to the surface, or evoking it, in the hypnotic trance. Meanwhile, psycho-analysts, whilst they agree in dividing the whole mind into conscious and unconscious strata, differ profoundly on the origin of the unconscious. The extreme

Freudian view seems to be that the unconscious mind consists wholly of repressed materials. On the other hand, Jung and his adherents regard the unconscious rather as the primitive basis of mind out of which consciousness has arisen. Here, again, therefore, we find conflict rather than unity.

(*d*) A last source of trouble consists in the importation into psychology of concepts and theories borrowed from other sciences, and assumed to be valid for psychology too. Not infrequently the point of view from which mind is approached exhibits some such theoretical bias which inevitably is reflected in the limitations of the resulting account. An enquirer, for example, trained to work with the concepts of physics or even of physiology, is very commonly ill at ease in psychology and distinctly hampered in dealing with the more spiritual forms of experience. On the other hand, a student who approaches psychology with theological habits of thought will constantly use language which to his scientific neighbour will seem illegitimate, if not unintelligible. Again, if we start by taking for granted the two-substance theory of body and mind in the form of epiphenomenalism (i.e., the theory that mind is a mere by-product of the bodily machine) or psycho-physical parallelism (i.e., the theory that mental and physical processes run side by side without influencing each other), we are

committed to regarding mind as completely ineffective and otiose. It is there, but it does nothing. It has no assignable function. It does not determine behaviour: it neither receives anything from, nor gives anything to, the physical world. Either of these dualistic theories brings us at once into conflict with the evolutionary view that mind is useful in the struggle for existence, as an organ for better adaptation to the environment, and hence for survival. Intelligent behaviour, learning by experience, guidance of conduct by cunning and knowledge simply have no place in the pattern of epiphenomenalism or parallelism. But even the evolutionary point of view, though it does assign to mind a function, yet fails to do justice to it, because, as a rule, it takes as its standard the function of mind in animal life rather than the range and power of which it shows itself to be capable in human achievements at their best. Whether we take mind to be distributed over a wider or a narrower area within the realm of living organisms, on any view there is between the lowest and the highest types of mind an infinite range of differences in feeling, in knowledge, in foresight and constructive purpose. In the past the introspective psychologist has conspired with the physiologist to work on the assumption of the mind-body dualism, with the result that he, from whom a more complete

treatment of mind might have been expected, has filled our text-books with abstract generalities, to the neglect of the study of mind in its concrete manifestations, in social life, in economics, in politics, and, again, in the creation or enjoyment of works of art, or in the varieties of religious experience. It is only within comparatively recent times that more detailed studies in social, or æsthetic, or religious psychology have appeared, but very commonly they have suffered from the prevailing confusion in the theoretical groundwork of psychology.

It is chiefly for these reasons that present-day psychology cannot with its whole authority give any single answer to the question, What is and what does a mind ?

4. Moreover, the answer to this question, as has already been mentioned, is not made easier by the legacy of problems which psychology owes to its history. It will repay us to glance at this history, for, without it, we can hardly appreciate the significance of the most recent movements in psychology.

If psychology began when man first learned to recognize the soul, its origin lies hidden in the mists of the past. But an imaginative reconstruction of the early story may be attempted with a fair degree of plausibility. Primitive man was both daring

and ingenious in his speculations about the facts which struck his attention. Foremost among these, we may suppose, must have been death, and the plainly observable difference between the dead and the living. A living body is warm, breathes, and moves. A dead body is cold, stark, and motionless. What more natural than to explain the difference by supposing the presence of something in the living which is absent from the dead? This something is the original "soul," the Latin name of which, *anima*, still bears witness to its birth in breath. This is the nucleus from which have developed, through many vicissitudes of speculation, the "consciousness" and the "behaviour" of modern psychologists.

The heat of the living body would readily suggest that the soul must be akin to fire, and the identification of fire and spirit, literally or metaphorically, has remained ever since a persistent strain in religious language and symbolism. Again, the breath, impalpable, invisible, yet real, must have helped towards the concept of the soul as having these same qualities and as made of a substance more tenuous and refined than the body. Thus was mediated the transition to the concept of the soul as "immaterial," and this immateriality, together with imperceptibility to the senses of an observer, has been inherited by the modern concept

of " consciousness." Further, sooner or later, speech and other purposive actions must have been singled out among the movements especially of the human body, and the concept of the soul as the source of these must have been expanded so as to include the power of perception, thought and feeling. But many centuries had to pass before the concept of " consciousness " was formed and fixed in a distinctive word. Even during the classical period of Greek Philosophy we find no clear recognition of consciousness as distinct from bodily life. It is not until the second century of our era that a term for it appears in the literature. In other words, the soul began its career simply as a principle of life.

With this first strand of soul-theory very early a second must have mingled, representing in its junction with the first an even more venturesome flight of synthesis on the part of primitive man. Not accustomed to distinguish, as we do, between dreams as unreal and waking perceptions as real, and inclined, moreover, to attribute to dreams a special significance, primitive man may well, so it has been suggested, have fused the dream-appearances of departed persons with his concept of soul. If the soul is present in the living body, absent from the dead, it must soon have been conceived as distinct and separable from the body and

capable of independent existence. Thence it was but a step to the two-substance theory of body and soul, on the one hand, and to the belief in survival of death and immortality, on the other. It is needless to dwell on the elaboration of this *motif* in mythology and religious belief, from ancestor-worship to the transmigration and re-incarnation of souls, from the dismal abode of bloodless shades in Hades to the Isles of the Blest in Greek story or the Happy Hunting Grounds of the Red Indian brave. The heaven and hell of popular theology have here their ultimate roots, but they have become interwoven with a belief in the moral government of the world, requiting sin with punishment and rewarding repentance with redemption.

We strike here a third strain, and a much later one; attributable in Western thought, if Professor J. Burnet is right, to no less a thinker than Socrates. This is the truly "spiritual" conception of the soul as that in ourselves the *moral* excellence or corruption of which ought to be our foremost concern. Henceforth the condition of the soul in respect of virtue or vice, purity or pollution, becomes a matter of care and solicitude. We are on the threshold of the concept of it as something requiring to be "saved." From Socrates, by way of Plato and the Stoics, we are led to the Christian doctrine of sin and salvation which has dominated Western man's

interest in the nature and destiny of his soul, whenever he has approached these questions from the point of view of his religion. The great Eastern religions almost all offer variants of the same theme. For, though they have conceived salvation, and the way to it, and the need for it, somewhat differently, yet the underlying principle of an escape from the bondage of illusion, intellectual or moral, into the freedom of union with God, or the All, is the same.

Adventurous indeed has been the journey of the original life-principle, and amazing the synthetic power which human thought has exhibited in working so many heterogeneous strands into the tissue of a single theory. Indeed, the web has become so large and complicated, and the connexions in places so loose, that it is little wonder that some of the intellectual interests which had participated in the weaving of it, should have broken free and sought a development along their own lines.

One of the obvious breaking points in the synthesis is death. The living creature—an embodied soul or a besouled body, as we may choose to take it—we can observe and study. What may befall it after death is guess-work; fit matter, in Plato's language, for "myth," not for "knowledge." If, then, we drop the setting of religious metaphysics, what remains? Precisely the standpoint of Aristotle's psychology—an unprejudiced study of

" soul " as exhibited by diverse kinds of living beings, or rather living bodies. A living body is " besouled," for Aristotle, when it is actively exercising its proper functions. What seeing is to the eye, that the soul is to the organism as a whole. The soul, in Aristotle's technical language, is the " form " or " entelechy " of the body. In other words, it is the body in action, all organs doing their appropriate work, and through them the whole body functioning as a whole. A plant-soul consists in the nutritive and generative processes the cycle of which constitutes the life of the plant. Animals add sensation, appetition, locomotion to these functions. The human soul shares all these lower functions, but consists specifically in the rational activities which man alone possesses. Thus, for a human being to be, or have, a soul is to do whatever things a human body can do. A human soul *is*, we may say outright, a human body engaged in all the various activities, from metabolic processes to philosophizing, which make up a typical human life.

Aristotle's theory of the soul is clearly, in our modern jargon, " functional " or " behaviouristic." In fact, his " soul " is what we mean by " behaviour," especially if we take the latter term in a sense sufficiently wide to include all the rational activities which are specifically human. Some of

our modern behaviourists, like E. B. Holt, are fully aware that their theory is a return to Aristotle's position.

Meanwhile, after Aristotle, the history of the soul took a turn which led away from behaviour to the discovery of " consciousness." It is commonly, and rightly, held that this turn was due to the increased emphasis of Christianity on inwardness, on the moral quality of man's feelings and thoughts, on the opposition of flesh and spirit. The effort to scrutinize the spiritual condition of the soul inevitably encouraged introspection and self-analysis, and led to the noticing and distinguishing of states and processes of consciousness taken as a realm opposed, as it were, to the outer and material world of which the body forms part. At the same time, the Christian scheme of salvation incorporated the belief in the survival of death, and therefore in the soul as a " substance " distinct from the body and capable of existing independently from it. The identification of this soul-substance with that which is conscious, and the opposition of both to body and matter, brings us, on the threshold of the modern period, to Descartes' dualism, i.e., two-substance theory, according to which matter is *res extensa*, substance which occupies space, and soul is *res cogitans*, substance which thinks or is conscious. It is no mere accident that Descartes

was one of the founders of modern physiology. In strict consistency with his dualism he tried a double book-keeping, dealing with the behaviour of the body in terms of the nervous system, conceived as a mechanism for responding with appropriate movements to sensory stimuli, and with the processes of consciousness in terms of sensations, ideas and volitions. That he was compelled to postulate the interaction of body and soul through the pineal gland shows how the unity of the conscious organism took its revenge upon his dualism.

The rest of the story is briefly told. Broadly, it has consisted of the effort to get rid of the soul-substance; and thereby of the body-soul dualism. First came, chiefly through Hume and Kant, the attack upon "Rational Psychology" with its theological affiliations, i.e., upon the theory of the soul as a spiritual substance, one, simple, indivisible, indestructible, immortal. Side by side with this, and largely under the influence of the theory of knowledge, there developed "Empirical Psychology," i.e., the analysis, mainly introspective, of the stream of consciousness, without reference to a soul-substance—in short, a "psychology without a soul." But consciousness, thus studied, is still burdened with the problem of its relation to the body. It is still an immaterial Somewhat in a dualistic scheme, a mysterious appendage of a

physical body. Some propose to surmount this dualism by the desperate expedient of denying consciousness outright and leaving only the body. The mind *is* the brain, they say. Others try to cling to the double book-keeping device and advocate psycho-physical parallelism. Some, like William McDougall, in *Body and Mind*, return to the soul-substance concept. Bergson identifies the soul with the cosmic *élan vital*. Most recently, the behaviourists have tried to escape from the tangle by means of the concept of " behaviour," but the extremists among them, like John B. Watson, are stultifying themselves by refusing to include consciousness in their theory of behaviour, and by professing to believe that psychology as the science of consciousness will go the way of pseudo-sciences like alchemy and astrology.

This is where we stand now. The " soul " (as substance) is gone. " Consciousness," if not going, is threatened. Between the " unconscious " of the psycho-analysts and the " behaviour " of the behaviourists, what is the outlook for psychology ? Can we discern anywhere the promise of a movement towards synopsis ?

5. Yes, we can discern such a promise. At any rate, it is as if the stage were all set for a synoptic movement to begin. We have no right, perhaps, to prophesy that such a movement will actually

take place merely because all the conditions seem eminently favourable, but we have a right at least to point out what these favourable conditions are.

(*a*) In the first place, there is common ground in the almost universal acceptance of evolution as the context within which a theory of "finite," i.e., animal or human, mind must be framed. The evolutionary point of view is shared by nearly all psychologists. Even those whose method is analytic and introspective will not deny that minds fall within the realm of the living, and that they presuppose, so far as empirical evidence goes, the existence of living bodies in good working order. There really seems no good ground for denying that the ingestion of food is as essential to "mental," as it is to "bodily," work, or that efficiency in thinking and willing requires a varied equipment of bodily responses and adjustments, technically called "motor-sets," ready for use as occasion demands. Minds, then, presuppose living bodies, both in the order of evolution, and as conditions of their existence and development here and now. Behaviouristic psychologists certainly, one and all, are found to stress this fact and even to exaggerate its importance. And philosophers, on their side, whether they be realists or idealists, appear ready to agree on this point, even to the very language in which they express it. To a realist, like Professor

S. Alexander, mind is a new quality or level of existence in the order of evolution, which comes into being with living bodies possessing a nervous system. It is a "perfection" supervening upon the appropriate bodily conditions. Precisely the same is the verdict of an idealist, like Bernard Bosanquet, who recalls Hegel's account of an *actuelle Seele* as "the perfection of a living body highly trained and definitely habituated." Conscious behaviour, they all agree, cannot be construed as the guidance of the bodily machine by a separate soul somehow attached to it. The most original or creative thinking is only made possible by, and grows out of, the whole organized system built up through the accumulation of conscious and unconscious doings and experiences.

(*b*) Secondly, the concept of "behaviour" signalizes a return to a more concrete study of mind. It is, as we have already seen, closely akin to Aristotle's concept of mind, and definitely emancipates us from the abstractions which the dualistic separation of body and mind inflicts upon us. A behaviourist, whose programme, like that of E. B. Holt, includes the study of man as "working or playing, reading, writing, or talking, making money or spending it, constructing or destroying, curing disease, alleviating poverty, comforting the oppressed, and promoting one or another sort of

orderliness," cannot be accused of neglecting anything that goes to make a man's mind what it is. It is all to the good that human activities should not here be described in parallel languages, viz., on the one side, in physiological terms as more or less complex responses to more or less complex stimuli, and, on the other, in terms of purely " inward " feelings, thinkings, willings. The concept of behaviour, so we would deliberately and emphatically suggest, has precisely the great merit that it permits us to use the terms of ordinary life, the total meaning of which combines within itself the experience of the observer describing others and the experience of the subject expressing his feelings and thoughts. The meaning, e.g., of " playing " is derived hardly less from seeing others play than from playing oneself. Neither way of experience by itself is adequate or sufficing. One has to do or suffer a thing, in order to " know what it feels like," to realize it in terms of one's own sensations of movement with their attendant pleasure or pain. This helps one to interpret what one observes others doing or undergoing. But, on the other hand, the observation of others in turn helps one to interpret the meaning of one's own feelings and sensations. It supplies that fuller understanding which comes from realizing what one's own conduct looks like to others and what

feelings and judgments it evokes in them. The total fact requires the fusion of both points of view.

In short, we are welcoming the concept of behaviour as delivering us from the body-soul dualism which compels us, in effect, instead of studying the living creature as a whole in its world as a whole, to split up our study of it into physiology on the one hand and introspective psychology on the other. How far behaviourists will accept this use of their concept is for the moment doubtful. E. B. Holt comes nearest to the position for which we are here pleading. He makes it very clear, in discussing, e.g., the behaviour of a bee, that it will not do to analyze its behaviour merely into separate reflexes answering to successive stimuli, whilst wholly ignoring the total pattern of its behaviour, viz., that it is collecting honey and carrying it home to the hive. The physiological side here is duly subordinated, but when Holt turns to human behaviour, it is not equally clear how far he recognizes and incorporates the fact, that an agent's experience of the action which he performs is different from the outside observer's experience who is merely looking on. He writes as if the analysis were always conducted from an observer's point of view. So, indeed, it must be with the bee, for the bee cannot tell us what her doings feel like. But, every word of our language which expresses human activity has, as

we said above, a meaning in the full understanding of which the knowledge which we get by observation of others and the knowledge which we have as agents must be joined and fused. From extreme behaviourists, like J. B. Watson, who reject the language of consciousness altogether, we must at this point part company. They impoverish the concept of behaviour too much to serve our synoptic purpose.

(*c*) Even the current controversy about "consciousness" and "introspection" brings grist to our mill. Watson argues as if there were no alternative between introspection, "looking into one's own mind," and external observation of another's bodily behaviour, and he would hold psychology strictly to the latter method. But this appears to overlook the fact that language serves for *self-expression*, and that we constantly make statements of psychological import about ourselves, without first going through the elaborate procedure of "turning our attention inwards upon ourselves" and "making an object of our own minds." When we say that we feel, believe, doubt, think, want, intend, etc., we are expressing and communicating our minds, and need no introspection for doing so. The meaning which these verbs have comes to them, not merely from our watching the behaviour of others or hearing their

language, but from our own experience of what it is to do these things. In short, self-expression by language, the meanings of which, coming from two sources, are subject to a twofold check, is a form of behaviour which emancipates the study and description of behaviour, among human beings at least, from exclusive restriction to the observer's point of view.

Psychologists rarely acknowledge this fact in so many words, though they always acknowledge it by acting upon it. The explicit recognition of it, we submit, permits and demands the expansion of the concept of behaviour so as to include the normal language of consciousness. There is, if this be admitted, no need to force upon all psychological terms a meaning which is either technically physiological, or else intelligible only from an outside observer's point of view. With this correction, the obvious objections which at present lie against the concept of behaviour, as advocated, e.g., by J. B. Watson, cease to apply and "behaviour" may well become the most useful term in the psychologist's vocabulary.

(*d*) Consciousness, then, if we are right, can be incorporated in behaviour, but we need not claim, therefore, that all behaviour is conscious. On the contrary, the concept of behaviour, taken as covering a range within which conscious behaviour forms the

higher levels, makes it possible, not only to take full account of all the habits and automatisms, acquired, or innate, which consciousness presupposes, but also to include the "unconscious" of the psycho-analysts. The way in this direction has been shown by E. B. Holt's *Freudian Wish*, which restates Freud's principle in a most original way, making it available for the psychology of the normal mind instead of merely for that of the pathological mind. What the psycho-analyst is studying is persistent tendencies to behaviour which, though powerful in themselves, are so strongly repressed by dominant behaviour-systems more powerful than they, that they do not appear in consciousness at all, except in a disguised form in dreams, or by misfits and derangements of conscious behaviour indicative of hidden conflict.

(*e*) And, lastly, there is a convergence of philosophical theories from very different sides upon a view of mind which may fitly round off our tale. A creature's behaviour is relative to its environment, is a "function" of it, in the technical language which some psychologists have borrowed from mathematics. *Vice versa*, the environment is relative to the creature: its world is what it responds to, what it takes account of in its behaviour. A dog's philosophy, so it has been said, would be: What smells is real; what does not smell is nothing.

This is probably unfair to the dog who, we would gladly believe, loves his master for more than his smell, even if he recognizes him chiefly by his smell. But the principle is sound: a creature's world is defined by what it responds to, including, of course, conscious response where that occurs. Its world is a selection out of the wider universe, a "cross-section." Creatures with a keener sense of smell than ours, for example, have to that extent a wider world than we. The same principle applies to the human world. The world in which each one of us lives is defined for him by his responses and interests. This is quite a familiar fact recognized in every comparison of mind with mind. One man is aware of, and loves to contemplate, study, and enjoy, things of the very existence of which most of his neighbours are unaware. Or, even when they are aware of the same things, one man's understanding of them may be far completer than another's. Or, again, one man's range of interests may comprehend and include those of many lesser minds; take, e.g., the mind of a Leonardo, or a Goethe, or a Napoleon. The point is not affected, even if with some of the English realists, like Alexander, Laird, and others, we insist on distinguishing between the mental acts of apprehending and the non-mental objects apprehended. For it will still remain true that, when we rank and estimate minds,

be it in respect of their scientific knowledge, be it for skill in business, or wisdom in statesmanship, be it merely for wit or humour in conversation, we value, not their acts of apprehension in the abstract, but the worlds to which they show themselves responsive. A mind, in fact, as we said earlier in the lecture, is a *world*, when we think of what habitually engages its interests, elicits its feelings and purposes, is the object of its thoughts and actions. On some such concept of mind a behaviourist, like Holt (from whom, above, we borrowed the term " cross-section), and an idealist, like Bosanquet, appear to converge. Of course, " cross-section " must be interpreted to cover past experiences as well as present, and likewise anticipations of future events and plans to meet them. It must cover equally the behaviour of a thinker who focuses the experiences and studies of a lifetime into the writing of a book, and that of a general who plans a campaign. A mind, according to its range and power, focuses within itself a more or less varied section of the universe. Consciousness, according to its degree, makes for wider and also more systematic responsiveness. Above all, it seems that only where there is consciousness do we find a measure of self-direction, of freedom, initiative, experiment and exploration in practical construction and invention,

creative originality in the search for truth and for beauty. Activities such as these are, by every usage of the term, credited to "mind," but they are "behaviour," too—behaviour which is conscious—indeed, which is of that intensely conscious kind described by Bergson as the "spear-point" of creative advance. In some such way as this we must conceive the mind of man, of which we spoke in the first lecture as moulding Nature to its needs and using Nature's materials and forces in the building up of its civilization.

BIBLIOGRAPHY

1. Alexander, S. *Space, Time and Deity.* (Macmillan & Co., 1920.)
2. Bergson, H. *Matter and Memory.* (George Allen & Unwin, 1913.)
3. Bergson, H. *Creative Evolution.* (Macmillan & Co., 1914.)
4. Bosanquet, B. *The Principle of Individuality and Value.* (Macmillan & Co., 1912.)
5. Burnet, John "The Socratic Doctrine of the Soul" (*Proceedings of the British Academy*, Vol. VII.)
6. Crawford, W. J. *The Psychic Structures at the Goligher Circle.* (J. M. Watkins, 1920.)
7. Hoernlé, R. F. A. *Studies in Contemporary Metaphysics.* (New York: Harcourt, Brace & Co. London: Kegan Paul, 1920.)
8. Holt, E. B. *The Concept of Consciousness.* (George Allen & Co., 1914.)
9. Holt, E. B. *The Freudian Wish.* (Henry Holt & Co., 1915.)
10. Merz, J. T. *A Fragment on the Human Mind.* (W. Blackwood & Sons, 1919.)

11. McDougall, W. *Body and Mind.* (Methuen & Co., 1911.)
12. Richardson, C. A. *Spiritual Pluralism and Recent Philosophy.* (Camb. Univ. Press, 1919.)
13. Tansley, A. G. *The New Psychology.* (George Allen & Unwin, 1920.)
14. Watson, J. B. *Psychology from the Standpoint of a Behaviourist.* (J. B. Lippincott, 1919.)

For behaviourism in its extremest form the reader may consult, in addition to No. 14, Professor Watson's very illuminating paper under the title, " Is Thinking merely the Action of Language Mechanisms ? " in the *British Journal of Psychology*, Vol. XI, Part I. Behaviourism in its broader and more philosophical form is best studied in No. 9. The concept of mind as a " cross-section " of the universe is taken from No. 8, ch. ix. Otherwise, this book should be used with caution, as no longer representing Professor Holt's views. No. 13 gives a convenient account of the influence of psycho-analysis on the theory of mind. It avoids the sensationalism of which psycho-analytic literature is sometimes guilty. The realistic theory of mind as a tissue of mental acts is most fully set forth in No. 1. But the reader might also refer to Professor John Laird's *Problems of the Self* (Macmillan & Co., 1915) and *A Study in Realism*, ch. viii (Camb. Univ. Press, 1920). Nos. 2, 3, 11 and 12 may be studied for views of mind at variance with the view adopted in this lecture as best fitting into a synoptic pattern. This latter view has been greatly influenced by No. 4, especially chs. ii–v. No. 7, ch. viii, may also be consulted. No. 10 traces in an interesting manner the way in which the world of mind develops. No. 6 is the most recent record of the attempts of an English scientist, by profession a lecturer on engineering, to apply the methods of physical science to the study of materializations. The same investigator's *The Reality of Psychic Phenomena* (J. M. Watkins, 1917), and *Experiments in Psychical Science* (*ibid.*, 1919) may be referred to for earlier reports. It must, however, be pointed out that all Dr. Crawford's books are *popular* expositions rather than *scientific* treatises, and that the experiments of other investigators with the Goligher circle, made after Dr. Crawford's death, have led to negative results and thrown a great deal of doubt on the adequacy of his methods. For wider reading on all the lines of evidence commonly summed up as " psychical research," and for their bearing on our theories of the soul, students will be well advised to go straight to the *Proceedings*

of the Society for Psychical Research (London : Francis Edwards). They must judge for themselves how far they will adopt the very positive and confident conclusions put forward, e.g., by Sir Oliver Lodge in *The Survival of Man* and in *Raymond*, or by Sir Arthur Conan Doyle.

LECTURE V

RELIGION AND THE MEANING OF "GOD"

"The feeling of the Divine is justified, as we shall see; yet not all opinions based on it are justifiable."—Varisco, *The Great Problems*.

IN our last lecture, greatly daring, we had ventured to suggest that the concept of "behaviour" might prove elastic enough to incorporate within itself "consciousness" as well as "the unconscious," and to overcome, also, the dualism which splits the unity of living man into an "inward" stream of experiences and an "outward" body—a ghost-soul mysteriously linked to a piece of physical mechanism.

It is, however, only right that we should acknowledge that there are philosophers and psychologists of the first rank who still advocate the contrary view that body and mind are absolutely distinct entities. Thus, Bergson, partly on general metaphysical grounds, partly on evidence drawn from disturbances of memory, argues that the function

of brain and body is solely to supply motor-mechanisms through which the mind can act on the environment; and that " the mind overflows the brain," i.e., that much goes on in the mind for which there is no physical basis, or counterpart, in the brain.

Again, McDougall occupies an exceptional position among psychologists in maintaining that body and soul are distinct and that the soul can continue to exist by itself after its separation from the body. In his *Body and Mind* he offers a varied assortment of arguments in support of this view. Among them the most striking is his declaration that it is hardly conceivable that without the belief in immortality " whole nations could rise to the level of an austere morality, or even maintain a decent standard of conduct." Hence, he regards it as extremely desirable that psychology should furnish, if possible, scientific support for the belief that the soul survives bodily death. And he quotes with apparent approval Tylor's dictum, in *Primitive Culture*, that " animism " (which is the technical name for the theory of the soul as an entity independent of the body) is the groundwork of religion from the savage up to civilized man. " The future of religion is intimately bound up with the fate of animism."

We have, here, but another instance of a linkage

of ideas which, reaching across all abstract boundary lines, demands synoptic treatment. By an effort of abstraction we can limit our concepts to narrowly-defined fields and uses, and shut our eyes to all problems which press in from beyond our boundary-lines. But such problems do not cease to exist because we may choose methodically to ignore them. Life and literature keep forcing them again and again on our notice, and when we have once noticed them we cannot, except at the price of intellectual dishonesty, refuse to make the attempt to adjust our different accounts of different fields to each other and to form them into a coherent whole.

Our final task, therefore, in this present lecture is to bring religious experience and thought within the scope of our survey. Let us take stock of what appear to be the chief movements of thought in contemporary philosophy of religion, especially as they bear on the central problem of all, viz., the existence of God.

2. If we would be fair to our subject, we must confess at once, and bear in mind throughout, that religion is far too vast a topic to be adequately handled within the limits of time of a single lecture. If we want to say anything worth saying at all, we must select and concentrate, and, in order to do so, we must needs ignore many problems which religion raises and be content on many others to

take for granted, without debate, positions which would have to be debated in a fuller treatment. The problem which lies at the heart of religion is obviously the problem of God.[1] But before we can approach this problem directly, there is some preliminary spade-work to be done. Even at the risk of seeming dogmatic, we have to lay down, briefly, certain positions and to establish certain distinctions, in order to appreciate correctly the significance of recent contributions to the philosophy of religion.

In the first place, it is almost inevitable that to all of us who are brought up in the tradition of Christianity, the word "religion" should suggest exclusively the Christian religion. Whatever is most vivid in the meaning of "religion" for each of us must needs be drawn from that religion with the creed and ritual of which we are, by education and

[1] Or gods; but we may claim that the simplification is permissible in view of the evolution of religion from polytheism to monotheism, and the almost universal consent that monotheistic religions are "higher," i.e., exhibit the true nature of religion more fully. The Buddhism of Gautama is the only great historic religion which has in it nothing analogous to a personal God or gods. It may be questioned, for this reason, whether it is strictly a religion at all. But, as is explained further on in the lecture, it is impossible to frame any definition of religion which can be rigidly applied, and Buddhism is certainly more than merely a moral theory inculcating a manner of life. Like all religion, it bases its teaching of salvation on a definite theory of, and attitude towards, the universe as a whole, and its inexorable law of Karma has for a Buddhist's life and thought much of the meaning which God has for a Christian's.

participation, in some degree familiar. Yet the philosopher of religion, though in a Christian *milieu* he will draw his readiest illustrations from Christianity, cannot accept any limitation of religion to Christianity. Even though he may agree that Christianity is the highest and truest of religions, he cannot identify himself with the theological ardour which would divide humanity into believers and unbelievers, Christians and heathens. He cannot make it his business to take sides in the quarrels about orthodoxy and heterodoxy which have disrupted Christendom into hostile sects and denominations. It is not even part of his task to prove to the world at large that Christianity, in some one or other form of it, is the only true religion, and that all other religions are false and their votaries destined to eternal damnation. It is not in any such sense as this that the philosopher comes forward as a " defender of the faith." What, then, is the relation of philosophy to religion and, further, to theology? Briefly, we must answer that philosophy, with the help of anthropology, psychology, and the history of religions, takes a comparative survey and recognizes in religion a phenomenon that is universal in the human race at every stage of its civilization and in every period of its history. At the same time, philosophy recognizes also that

religion occurs in different types or forms, and that each type occurs in manifold degrees of completeness. And, lastly, such a survey, guided by the clue of evolution, enables the student also to distinguish more primitive from more advanced, cruder from more refined, types. The facts supply their own standard for grading; they exhibit the essence of religion more or less perfectly, and the most perfect examples, here as elsewhere, must guide the philosopher in his interpretation of the whole range of the phenomenon. *The one thing that philosophy ought not to do is to estimate, or rank, religion by a non-religious standard.*

Every religion has as its centre a creed, and this is true even of those religions in which much more importance is attached to the due performance of ritual than to the performer's belief in the creed. Even though the community may not exact from the individual more than conformity in ritual, yet the ritual, in the last resort, presupposes the creed; and " every creed," as a recent writer has put it, " is a view of the universe, a theory of man and the world, a theory of God." In short, religion always includes theology, in however rudimentary a form, and all the more developed theologies owe much to philosophy, are indeed philosophical systems on a religious basis. But, for this very reason, there is a clear difference between theology and philosophy

of religion. Although theology might be, and occasionally has been, studied in an attitude of detached and unbelieving curiosity, it is normally the central point of the professional training for the ministry or priesthood of a given religion. The theologian stands on a particular denominational basis. He is not only religious, but the member of a particular religious community, or church, and it is the tradition and doctrine of his church which he sets himself systematically to expound and defend, accepting it sincerely as the truth with which his religion stands or falls.

Philosophy of religion, by contrast, is not tied to a particular religion, but takes religion *as such* for its province. It tries to understand religion in all its varied forms and degrees, to appreciate its place and function in human civilization, and in the individual. Above all, it tries to *evaluate* religion, to justify it as a reasonable attitude for reasonable beings. In this general sense, philosophy has been, and still is, a " defender of the faith."

3. This last statement may well provoke objection. And this is, perhaps, our best opportunity for considering shortly the diverse tendencies in modern life and thought which are hostile to religion in any form in which it is more than " morality tinged with emotion." As a statement of fact, indeed, our assertion is fairly secure.

Almost all the great philosophers of modern times have taken religion seriously. Without necessarily defending all the details of the Christian, or of any other, theology, they have yet defended religion as such. They have tried to show that the nature of the universe sustains and justifies, in principle, the religious attitude. But, as a statement of how philosophy ought to deal with religion, our assertion will be challenged by all who hold that, so far from justifying religion, it is the function of philosophy to emancipate the human mind from its bondage to religion. There has been growing, throughout the nineteenth century, a steady counter-current of revolt against religion, which has reflected itself in sharp criticism of every philosophy of religion which does not either identify religion with morality or, else, treat it as a superstition to be overcome by the advance of civilization and science. The roots of this movement are spread so widely through every province of human thought and activity, that its advocates have some excuse for their claim to be the heralds of the future, the leaders of "progress." The philosophically most powerful representative of this tendency is "positivism," and in Comte's law of the three stages of human thought—theological, metaphysical, positive—it has found the classical formula for its interpretation of history and for its gospel of

progress. The emancipation of science from theology, of which we took note throughout the preceding lectures, though its beginnings date back beyond positivism, yet received from it a fresh impetus. Everywhere positivism stands for the rejection of all beliefs in the supernatural as mere survivals of pre-scientific modes of thought. History, anthropology, psychology are studied from a naturalistic angle, and then in turn invoked to reinforce the positivistic conclusion about religion. The very fact that to the anthropologist the beliefs of primitive peoples which he studies are nothing but superstitions and myths, and their ritual full of magic, opens his eyes to many survivals of myth and magic in the symbols and language of his own religion. Thus a process of detachment and scepticism has set in. Religion in all its forms is approached, not as something which is being believed, accepted, lived, by the student, but as an object for aloof intellectual curiosity. All human beliefs, it appears, can be studied as facts, in entire abstraction from the question of their truth. *Die Wissenschaft kennt keine Werturteile*[1] is the classic maxim for this attitude. Indeed, if the student begins by regarding primitive forms of religion as obviously false, this judgment will inevitably

[1] It is not the business of science to pass judgments of value (scil., on the objects which it studies).

extend to the higher forms, too. If religion began as superstition, why should it not end as such? Similarly, psychology, working on Mr. A. J. Balfour's principle, " Scratch a reason and you will find a cause," shows that beliefs are commonly induced by a variety of non-rational causes, and may persist, not only in the absence of objective reasons for them, but in the face of patent counter-evidence or inherent improbability. Even concerning metaphysical beliefs, one of the greatest living metaphysicians, Mr. F. H. Bradley, has remarked that " metaphysics is nothing but the finding of bad reasons for what we believe upon instinct." True, he goes on, at once, to add that " to find these reasons is itself an instinct," nor does its origin in instinct necessarily imply that a belief is false. Still, the reaction against religion persists, gaining no little strength from the ill-judged insistence of the orthodox on the literal acceptance of much in the traditional doctrine which deserves to give way to better knowledge or finer feeling. The cause of religion has suffered at the hands of its friends by their attempt to retain much bad science in the bible, and much bad logic in theology.

That the positivists themselves should have founded a church of the " religion of humanity," which enlisted the enthusiasm of some of the finest spirits of the age, like John Stuart Mill, is no doubt a

tribute to the strength of the demand for religion in human nature. But what is most significant about the new religion is the point of its challenge to the old. For the ineffective love of a supernatural, or even non-existent, God it seeks to substitute the effective love of actual men and women. From preoccupation with the salvation of his soul in a life after death it seeks to turn man to the service of his kind in this life. It aims at making the energy of religion available in the cause of human progress, for the fight against disease, poverty, ignorance, crime. It preaches a crusade against remediable ills in the cause of a better future for the human race on this earth. Thus, positivism in its opposition to the supernatural is as characteristically the philosophy of a scientific age, as in its moral fervour for the amelioration of the human lot it is the philosophy of a philanthropic age. The " meliorism " of William James and the pragmatists echoes the similar attitude of Mill. Both point to the existence of evil as incompatible with the perfection of the universe, be that perfection predicated in the name of the God of theology or in the name of the Absolute of philosophy. Both declare that the belief in perfection must corrupt the moral effort at its source. Is it not illogical to try to better a world which is already as good as it can be ? If this is the best of all possible worlds,

morality is meaningless, and either resignation, or the taking of " moral holidays," is the only logical course. On the traditional view, the existence of evil presents an insoluble theoretical problem. On the meliorist view, there is no problem of evil except the practical one, how best to do away with it. This moralistic strain of thought has exercised an influence upon religious thought far beyond the borders of positivism proper. It has revived the old problem of whether God's goodness and wisdom are compatible with his omnipotence, and a philosopher like James Ward, a theologian like Dean Rashdall, are found inclining to a " limited " Deity—finite in power, infinite in goodness—as the most reasonable escape from the horns of the dilemma.

This is undoubtedly one of the gravest problems which the philosophy of religion has to face. For a full discussion of it this is not the place. But the outline of an answer to the melioristic view may be briefly sketched. (1) In the first place, the evidence of religious experience is decisively against the attempt of meliorists to shrink religion to a moralistic pattern, or to fix the attitude of uncompromising hostility to evil as the exclusive attitude of religion. The saintliest of men have, as a rule, risen beyond the antagonism of good and evil, and yet there has been no weakening of their efforts or

their influence for righteousness, as the records of their lives abundantly show. To quote but one recent example. The Bengali saint and mystic, Ramakrishna, said towards the end of his life: "I have now come to a stage of realization in which I see that God is walking in every human form and manifesting Himself alike through the saint and the sinner, the virtuous and the vicious. Therefore when I meet different people, I say to myself: 'God in the form of the saint, God in the form of the sinner, God in the form of the unrighteous and God in the form of the righteous!' He who has attained to such realization goes beyond good and evil, above virtue and vice, and realizes that the Divine is working everywhere."[1] Examples such as this might be multiplied indefinitely. They show that the moralists in religion commonly ignore the *mystical* attitude altogether. (2) The concepts of God's love, of redemption, atonement, forgiveness of sins, take us, not indeed towards any condonation, still less towards any encouragement, of evil, yet in a direction very different from the meliorist's hope. They do not weaken the springs of moral effort, but they warn us not to overestimate their strength. They teach us—and here, surely,

[1] *Gospel of Ramakrishna*, p. 88. See also Max Müller, *The Life and Sayings of Ramakrishna*. I owe quotation and reference to J. B. Pratt's *The Religious Consciousness* (Macmillan & Co., 1920), pp. 132–3.

they are at one with common experience—not to expect the complete disappearance of evil through the complete perfecting of human nature by human effort. The roots of good and evil lie very deep in human nature and also very close together. The moral problem presents itself afresh to each generation, and in terms which change with every new development in civilization, with new powers and new opportunities giving rise to new desires and altered human relationships. For all a parent's efforts to hand on the hard-won moral heritage to his children by precept and example, he knows well enough that in the main they must acquire the knowledge of good and evil, by which they will actually live, through their own trial and error. *Eritis sicut deus, scientes bonum et malum.*[1] The " knowledge " here in question must be, for us human beings, not a mere spectator's, but an agent's knowledge—a knowledge gained by the good or evil which we personally feel and do. Again, self-control comes only with self-knowledge, and self-knowledge is never complete so long as we constantly find ourselves in new situations to which in temperament, judgment, and purpose we may prove unequal. These hazards seem inherent in human life, and no meliorist has yet shown a way

[1] Ye shall be like unto God, knowing good and evil. Cf. Goethe's *Faust*.

to eliminate them. And even if they could be eliminated, how many of us would, with Huxley, be willing to surrender the management of our own lives and be regulated like a clock, on condition of never going wrong?

It is not to be forgotten that this whole reaction against religion is, as a movement in the Christian world, a reaction against Christianity. But the meaning of "Christianity" is not simple or single. It may, e.g., mean the bare gospel-record of the teaching of Christ; it may mean the whole body of doctrine built upon that foundation by the Church; it may mean the Church as an organization, the acts and policies of which, quite apart from its spiritual teachings, make it a force in human affairs. If the positivist reaction was provoked in part by certain metaphysical and moral features of Christian theology, it was also directed against the Church as a powerful instrument of dominion over the lives and minds of men. Symptomatic of this is the fact that the word "laique" has taken on, in the sociological theories of religion of the Durkheim school, the meaning of "anti-clerical," reflecting the antagonism of church and state in the political life of France.

At the same time, the trial of the war has made it clear that perhaps the profoundest reaction of men against the Christianity of the churches is due

to the perception of the fact that the churches have, on the whole, failed to make the teaching of Christ an effective force in the lives of Christian communities. The most obvious criticism which an intelligent non-European will invariably make upon the white man's civilization is that, by and large, Christians do not practise what they preach, and do not seriously try to. And who will confidently deny the charge ? Religion, whatever else it may be, is not departmental. It claims to control and pervade the whole of life. It is not an affair of special moods or exceptional moments. It is not intended to be shelved on weekdays and exhibited on Sundays by going through a conventional routine. It is a thing to live by, always. Now, this being so, it is a simple question to ask : How far are our policies and institutions, political or economic, ordered with any definite reference to the Christian ideals which we profess ? The facts, surely, are rather that since we have abandoned the mediæval ideal of a theocratic state on earth, both politics and economics in their public or communal aspects have emancipated themselves from the control of religious ideals, the sphere of which in consequence has shrunk to the individual's private conduct. Religion is, no doubt, the direct relation of the individual to God, yet it does not follow that the social order which so

largely determines the individual's aims, duties, and standards of judgment, is indifferent and negligible. Yet, this is exactly what the social order is all too often treated by the churches as being. The most vital and burning problems which at the present day divide men's minds centre precisely round the values for which the existing order stands. Yet, in the main, the churches, which claim to be our guides and guardians in questions of value affecting the whole conduct of our lives, stand timidly aloof and their leaders but too often utter only benevolent exhortations, from which neither they nor their hearers trouble to draw the practical consequences.

That the churches should, as is commonly acknowledged, be losing their hold, and that much genuinely religious life should be alienated from them and seek an outlet through other channels or languish for lack of an outlet, is in the circumstances not a matter for wonder. But, in spite of this, the philosopher, taking a comprehensive survey of human experience and thought, has little difficulty in discerning the central place which " religion "—a term which in this assertion means something more fundamental than assent to this or that theology, or membership of this or that church—holds in normal human life. Whatever the fluctuations in the fortunes of churches may be, or, again, the quickenings and

slackenings in the energy of men's religious life itself, philosophy renders to religion the service of making the need of it and the justification for it clear to reflective consciousness.

4. We have followed the negative argument long enough. Let us now turn to the positive side and consider the procedure of philosophy in its defence of religion.

We said above that philosophy has to " evaluate " religion. The phrase may have suggested philosophy sitting in the judgment-seat, and religion coming before it to assert its own value and accept philosophy's verdict on its claim. But, whence is the supposed philosophical judge to take his own standard for measuring the justice of that claim ? Philosophy has nothing to philosophize with except what human experience offers to it as material for reflective synthesis or synopsis. There is, indeed, a *formal* principle by which the philosopher is guided, viz., the principle of consistency or coherence. But the *matter* to be moulded in this form consists of all the wealth which experience presents to him who would " think things together." This implies at once that the existence of religion is one of the cardinal data for a philosophical synopsis. Whatever choice philosophy may have in the way in which it will fit religion into its edifice, it has no choice between accepting and rejecting it

Philosophy is not free to omit religion ; it simply cannot leave religion out.

But more : not only must it include religion among its data, but it must do so substantially on religion's own terms, and at its own valuation. It must concede the central place of religion. Its synopsis would be untrue to the proportions of the data, if it did not put in the centre the things which are in the centre. That religion is thus central or focal is a commonplace among all students of it. Psychologically, it is admitted on all hands, it is not " departmental." It is not an affair of the intellect alone, or the will alone, or the feelings alone, though any one of these three may be dominant in the religion of a given individual or a given age. In principle, religion involves the *whole* man : at its best, it is itself a synthesis, a unification, a harmonious stabilization of all sides of his nature. And for this reason, again, it is, in principle, not one departmental interest or activity among others : at its best, it pervades all interests and sweeps them into its orbit. This being its nature, it is best, perhaps, to follow those writers who speak of religion as an " attitude " rather than as an " experience." For " experience " suggests too much that religion is merely " subjective," mere inward feeling, mere thought without an objective basis. " Attitude," without ceasing to

connote the subjective side, yet suggests also activity, response, and thus implies the objective side, the universe, to which religion is the response. Moreover, " attitude " brings out, too, that religion is more than a theory: it is a way of life. It includes, indeed, always a theory, or theology, more or less reasoned and explicit, but it is first and always more than merely intellectual assent to a theory. And, again, whilst, no doubt, the theory aims at being true as tested by logical canons, and must be recast if it fails to meet that test, yet the truth of religious theory is not really separable from the success of the religious attitude. Religion claims to " work," to be known by its fruits. This " pragmatic " character of religion, too, is nowadays conceded by most of the students of it. Fruitfulness and moral effect are vouchers of truth. Or, perhaps, we should rather, with W. E. Hocking, use the pragmatic principle negatively: *that which does not work is not true*, and say of any theory which " lowers the capacity of men to meet the stress of existence, or diminishes the worth to them of what existence they have," that it is somehow false, and that we have no peace until it is remedied. That religion works in the way here suggested by Hocking cannot well be doubted by anyone who honestly looks at the facts. Here is the verdict of the most recent student of the religious conscious-

ness, Professor J. B. Pratt :—" When one compares the deeply religious and spiritual person with the best and bravest of those who are not religious, one sees, it must be confessed, that the former possesses something which the others lack. It is not that he is any better morally than his non-religious brother, nor any more appreciative of beauty and love, nor any braver. It is, rather, that he has a confidence in the universe and an inner joy which the other does not know. He is, perhaps, no more at home in this world than the other (perhaps he is not so much at home here), but he seems more at home in the universe as a whole. He feels himself in touch, and he acts as if he were in touch, with a larger environment. He either has a more cosmic sense or his attitude towards the cosmos is one of larger hope and greater confidence. Besides this, or as a result of this, he has an inner source of joy and strength which does not seem dependent on outer circumstance, and which in fact seems greatest at times when outer sources of strength and promise fail. He is, therefore, able to shed a kind of peace around him which no argument and no mere animal spirits and no mere courage can produce."

We see now more clearly in what sense philosophy defends and justifies religion and accepts it at its own valuation. But we may throw light upon the

same point from another side. If philosophy, it may be said, defends religion, it should at least define what it is that it defends. Now this problem of defining religion is one which has given no end of trouble. Pratt refers to no less than forty-eight definitions from as many different writers, and rounds off the list by adding two fresh ones of his own. The reason for the difficulty is very obviously that religion is so multiform in type and degree, that a formula which would adequately reflect its variations would be intolerably complex. On the other hand, any compact formula will, in proportion to its compactness, fit part of the facts only, and compel us to reject as irreligious whatever it does not include. And there is a deeper difficulty which has induced one of the foremost English writers on religion at the present day, Professor C. C. J. Webb, to declare that any definition of religion is impossible, viz., the difficulty that it will always be either circular or irrelevant : the defining phrase will either surreptitiously slip in the term to be defined, or else miss out precisely what differentiates religion from other human attitudes. But, if religion is thus indefinable and unique, a consequence follows which has not always been observed. It is this, that the philosopher who sets out to discuss religion must himself be religious. For else, to put it bluntly, he will simply not know

what he is talking about. The outsider's point of view alone is here clearly inadequate. Whether a definition of religion be possible or not, no definition can enable anyone to understand what religion is who is not acquainted with it to some extent by being religious. Unless the student knows what the term "religion" means by being religious, there is no other attitude in which he can stand to religious language, belief, and cult, than the external attitude in which we all commonly stand to religions other than our own. Let a Protestant, brought up in ignorant contempt of "popish idolatry," watch a Roman Catholic service—the candles, bells, beads, incense, genuflexions and other ministrations, the repetition of lengthy formulæ in unintelligible Latin, the appeals to saints, etc.—and as he stands there, detached, aloof, unsharing, he may find it utterly unintelligible that the worshippers take part with reverence, and gain obvious peace and comfort. *A fortiori*, the mental distance is even greater when a European watches the ceremonies of savages, involving, it may be, animal sacrifices, grotesque dances, self-torture, or indecent rites. If it is hard for those brought up in one religion to understand another, it is doubly hard for those who are irreligious to understand those who are religious. Religion, then, cannot be intelligently discussed except by those who are acquainted with

it from within, though this acquaintance must needs be with some particular type of religion, in conformity with the student's whole intellectual outlook and social heritage. And this brings us back to our point: if being religious is the only basis on which we can philosophize about religion with genuine insight, and if being religious means living in a definite attitude towards the universe—an attitude engaging all sides of our nature, pervading all our activities, and including a core of belief or theory about the character of the universe and its disposition towards us—then we can understand why philosophy, so far from seeking to destroy religion as being unreasonable, has sought to defend its reasonableness by exhibiting reflectively its central position in man's life as a " life of reason." Whoever knows " from within " what religion is, cannot thereafter either build his philosophy without it or treat it as anything but central. Negatively, this appears even in the attitude of pessimism which is essentially an inverted type of religion, the *cri du cœur* of those who have failed to find, or to maintain, the attitude of confidence and trust in the universe, and who thence proclaim either that human existence has nothing of value to justify it, or else that our values, in a universe indifferent to them, are not destined to endure. For the pessimist this negative result is as central

in his whole scheme of thinking as is the opposite estimate for any philosophy which bases itself on religion triumphant. In either case, as Webb says, it is "with Religion that the interest in Reality as a whole, which is the characteristic interest of philosophy, first takes shape in the human mind."

5. In the technical language of philosophy, the position which we have now reached has been acknowledged and expressed in one of two ways. One way is to assert that religion is metaphysical, i.e., that metaphysics, as the explicit effort to frame a reflective theory of the universe as a whole by the thinking together of all sides of human experience, must take from the religious experience, or attitude, its most important clue to the nature of the whole. Religious feeling and thought must be accepted as, in principle, not fancy, or make-believe, but *bona fide* discovery or revelation of the real character of the real world. The other way, which leads to the same goal, is to be found in the handling by modern philosophers of the old arguments for the existence of God. The lesson which we have learnt from the destructive criticisms of the traditional arguments by Hume and Kant, is that these arguments failed precisely because they tried to demonstrate the existence of God without appealing to the evidence of the religious attitude

itself. The tactics of the traditional arguments were undoubtedly due to the distinction between revelation and reason. Religion being regarded as fundamentally based on revelation, i.e., on the self-revelation of God, the problem took the form of reaching the same assurance of God's existence by the road of reasoning, either from the evidence of design in Nature, or from the existence of the world as requiring a cause, or from the assumed perfection of the Supreme Being. None of these three arguments was free, in consequence, to appeal to religion itself, for that would have been an appeal to revelation, narrowly interpreted as an appeal to the Holy Scriptures and the authoritative teaching of the Church. By contrast, the argument of modern philosophy of religion does not assume, as its basis, this distinction between revelation and reason (or, in another form of it, between revealed and natural religion). Hence it does not attempt to prove—if " proof " is the proper word—the existence of God without an appeal to religious experience. And, whilst appealing to this experience, and, indeed, regarding it as the only really relevant evidence, it also enlarges the scope of it far beyond " revelation," so as to include, in effect, all that is valuable in the old appeal to " reason." The modern argument has learned much from the methods of Kant's

" postulates of the moral reason," for a postulate is essentially a belief held, or a theory affirmed, as implicit in the maintenance of an " attitude " towards the universe in the sense which we have above given to the term " attitude." To put it in a nutshell: we know God through religion, and there is no other way of knowing him. It is not that we are religious because we have become convinced antecedently, from other sources, that there is a God. Nor do we gain our conviction by an exercise of the " will to believe," if that means, Pascal-wise, taking a gambler's chance on the possibility of there being a God. If there is a " venture of faith " which outruns demonstration and yet is not sapped by doubt, it is because in religion we live by a conviction which the very habit of living by it re-enforces and sustains, and which justifies itself by a stability of outlook and response unshaken by the vicissitudes of human fortune, and by a strength equal to every call upon it.

The result of this re-orientation of the philosophy of religion, in respect of the problem of God's existence, is far-reaching. It means, as Webb puts it, that " the great question for the thinker about religion is not *whether God exists*, but rather *what God is*." Or, to put it differently, to doubt God's existence is, at bottom, nothing but to doubt

whether the universe, in its real nature, is such as to justify the religious attitude towards it ; whether it deserves to be worshipped. Even more strikingly the new technique appears in Hocking's attempt to exhibit what it is in our experience of the universe that we mean by " God." In the very form in which he thus puts the problem, it is taken for granted that " experience is essentially metaphysical," that it consists in the " discovery " and " recognition " of a real object. Proof of God's existence is, thus, not a process of building a precarious speculative bridge from the world we see to its unseen author, but a making plain what, in a sense, is there and possessed by us all the time, but what, for all its presence, we may fail securely to grasp or clearly to discern. We need argument because our hold on reality is variable. We live, we feel, we think, now on the surface lightly, now seriously and strenuously in the depths. This is why the assurance which religion as a living attitude carries with it and demonstrates in deeds, needs also to be raised to the level of reflective certainty, at least by, and for, those minds who, having once begun to think things together, are consumed by a cognitive restlessness which only the success of their synoptic endeavours can still. Thus, the argument does not start with a definition of God and then search the world of experience for an

object which conforms to the definition: it starts with the world of experience and, pushing through half-truths and partial impressions to its real nature, finds there the meaning of "God."

6. But we have anticipated in thus focusing our attention upon the problem of the existence of God. This problem is symptomatic of the revival of theism, which is the most recent, as it is also the most striking, movement in contemporary philosophy of religion. Among its literature, W. E. Hocking's *The Meaning of God in Human Experience* is written fresh from the life, as it were; the record of the philosophical pilgrimage of a deeply religious mind. C. C. J. Webb's Gifford Lectures, especially Vol. I, on *God and Personality*, develop a theistic philosophy in closest contact with the detailed structure of Christian theology. Professor A. S. Pringle-Pattison's Gifford Lectures on *The Idea of God in the Light of Recent Philosophy* reach a theistic conclusion, not so much through an interpretation of theological thought, as through a criticism, on the one hand, of naturalistic and agnostic tendencies in modern philosophy, and of pantheistic tendencies on the other. The significance of this movement will be the more readily appreciated when we recall that, not quite thirty years ago, F. H. Bradley, in *Appearance and Reality*, whilst declaring that nothing could be more certain than religion, yet

also proclaimed the God of theology to be " riddled with contradictions." Nor did Bradley hold out any hope that by further, and better, thinking we might remove these contradictions, for the chief of his theses was that all thinking is from its very nature bound to be self-contradictory; bound to pursue a consistency which it must ever fail to attain.

The effect of this doctrine might well have been to discourage all philosophical effort, had not Bradley qualified it by saying also that we cannot help thinking and, indeed, that we can think satisfactorily enough for all " practical " purposes. At any rate, since Bradley's book appeared, philosophical activity in all directions has been singularly varied and vigorous, and not least so on the subject of religion. There are at least three distinct tendencies: (1) There is the theistic tendency, already noted, which attempts a philosophical defence of belief in a *personal* God. (2) There is the tendency to emphasize, not so much God and personality, as the perfection, or value, of the universe. Höffding's definition of religion as " faith in the conservation of value " is a typical expression of this view, which for us is best represented by Bosanquet's Gifford Lectures on *The Principle of Individuality and Value* and *The Value and Destiny of the Individual.* (3) And there is the curious

doctrine of "Deity" which S. Alexander has recently put forward, as part of his "realistic" system, in *Space, Time and Deity*, and which presents familiar *motifs* in a highly original combination.

Let us glance at each of these three tendencies, remembering that within the time at our disposal we can do no more than pick out a central point or two.

(1) The strength of theism, as also its difficulties, lie in its interpretation of religion by *social* analogies and, consequently, its emphasis on the *personality* of the worshipper and the *personality* of God. The chief reason why metaphysicians of our second group shrink from the theistic position is just that they feel unable either to rank human personality so high, or to conceive God so anthropomorphically. For God as a person must needs be pictured to the imagination as a man writ large, and as we ascribe to him such human attributes as love, knowledge, will, power, we are ever conscious of alternative dangers, both equally fatal. For, on the one hand, we feel driven to assert that all these attributes exist in God in a perfection utterly beyond anything we know in man. Yet, the more we stress this transcendent perfection, the more do our terms threaten to become meaningless. On the other hand, the more vividly concrete we seek to make their meaning, the more do we shrink God to the

dimensions of the human patterns with which we are familiar. However, we do not wish now to exploit these dialectics. The fact stands that, in proportion as the worshipper feels himself responding to a power which responds to him, his religion takes on the theistic form, even though it acknowledges more than one God, or a devil as well as a god. Almost all the higher religions employ the language of social intercourse at its most intimate to render the worshipper's sense of his closeness to, and trust in, God. To know God, and to be known by Him ; to love God, and to be loved by Him—is not the best of Christianity summed up in these simple and familiar phrases ? God as father, God as judge, God as King—always a social relationship supplies the pattern on which the worshipper's attitude is moulded. Webb admits that the concept of God as a person is of very recent origin even in Christian thought, and that Christianity is the only one of the great historical religions the theology of which culminates in that concept. But he also argues that this is " the natural culmination of a tendency traceable in all Religion," and with skill and sympathy he sets himself to show that the chief concepts of the Christian religion—sin, forgiveness, justice, sacrifice, union with God—gain both in intelligibility and in moral power when God is conceived as a person. Thus, e.g., " to regard Sin

as an offence against a personal authority, and still more to regard it as an affront to a loving Father, is a more intelligible and a more ethically significant way of thinking about it than it is to conceive it after the analogy of a physical defilement or an automatic mechanism." And both love and knowledge, when applied by religion, suggest an intimacy of union in which the distinction of persons adds richness of content and is so little an obstacle to union, that we may well come near to Spinoza's language about our love towards God being the very love with which God loves himself. For " God in us " is as essential to the full religious attitude as " God above, or beyond, us."

The same social character of theism is developed in a very different and strikingly interesting way by Hocking.[1] After emphasizing that religion in its higher forms grows into a sense of God as the " intimate, infallible associate," the " companion " whose constant presence brings peace of mind and happiness, he describes the " original source of the knowledge of God " as " an experience of *not being alone in knowing the world*, and especially the world of Nature." This clue he follows up into an analysis

[1] Perhaps Hocking's argument owes something to a position which Royce outlined in his early work on *The Religious Aspect of Philosophy*. But, if so, Hocking has re-thought and re-stated the argument in a thoroughly original way, and the direct affiliation to Berkeley which it had in Royce, has dropped wholly into the background in Hocking.

of our knowledge of Nature as a world actually, or potentially, common to ourselves and others, and of our knowledge of other minds as minds also knowing, or interested in, just these objects which we know and are interested in ourselves. And over this bridge of the social character of knowledge he seeks to travel to the conclusion, that in knowing Nature we are in social contact with the great Other Mind which communicates itself to us through Nature, and which to religion reveals itself in the character of God.

(2) The second type of philosophy of religion does occasionally express itself in language which, torn from its context, may seem to identify it with straightforward theism. Thus Bosanquet ends his chapter on " The Religious Consciousness " with the words : " Religion establishes the infinite spirit because it is continuous with and present in the finite—in love and in the will for perfection. It does not need to appeal to facts of separate being, or to endeavour to demonstrate them. It is an experience of God, not a proof of him." This last sentence illustrates admirably the change in the point of view of modern philosophy of religion which we had pointed out above. But " God " for Bosanquet in this passage is not the personal Spirit of the theist, but rather the impersonal, or super-personal, Reality in its character of perfection.

The theist's God is characterized by Bosanquet, in a passage immediately preceding the one just quoted, as "an appearance of reality, as distinct from being the whole and ultimate reality." When we translate this statement out of the technical language of philosophy into the language of every-day life, it means (*a*) that the social analogies and metaphors through which ordinary religious thought expresses itself cannot be taken literally, as if they were either plain statements of fact or ultimate philosophical truths. And (*b*) it means, more especially, that the theist's concept of God, as the will for good against evil, is still too much coloured by this antithesis of good and evil to be adequate to a Reality which, as a whole, is perfect. Thus there is a subtle change in this reading of religion. This comes out clearly in that Bosanquet does not regard religion as specially connected with the supernatural, or even the divine (*scil.*, as conceived by theists). It is, for him, the attitude to whatever one at once fears and approves, i.e., worships. "Whatever makes us seem to ourselves worthless in our mere private selves, although or because attaching ourselves in the spirit to a reality of transcendent value, cannot be distinguished from religion." This view is explicitly intended to provide for *false* religions, i.e., it allows that this attitude of self-surrendering attachment and worship

may be directed to an object undeserving of such devotion.[1] What object, then, is deserving? The answer gives us Bosanquet's meaning of " God," or rather what he would mean by " God " if he did not on the whole avoid the term because of its theistic associations. His own strict language is studiously impersonal: he means by " God " Reality as a whole, conceived as perfect, and as transcending and transforming within itself the opposition of good and evil. In this perfection man participates, and religion is his sense of this participation, of his fragmentariness made whole, of the evil in him overcome, of his life, for all its failures and blemishes, filled with value. " Every satisfaction and achievement—every self-transcendence in which we become united with something which was beyond us—may be religiously felt, if it is taken as involving recognition of a higher perfection, that is, as coming to us not in our own strength, but as a pledge of our absorption in the greater world."

Compared with the concrete imagery of current theology, such a rendering of religion will inevitably seem pale. The theist's language has the advantage there. But it is to be noticed that the pallor of the language reflects not thinness of experience,

[1] Patriotism, for example, will be religious by this formula, and it would be an interesting question, whether, or under what conditions, it is a " false " religion.

but a fullness and intensity to which the more familiar terms of religious speech seem inadequate.

(3) Our third type of philosophy of religion—Alexander's—shares the modern approach: "Religion is not the sentiment which is directed upon God, but God is that upon which the religious sentiment is directed. The datum of experience is that sentiment, and what God is is known only by examining its deliverances." "What we worship, that is God." But it takes a highly original turn by treating "deity" or "divine quality" as a term more fundamental than God. "God" is the name for any being (there may be more than one) which possesses "deity." Deity, moreover, is a metaphysical term; in other words, it belongs to philosophy to show, by an examination of the whole system of things, that what religion worships as God really has the quality which alone justifies the religious passion. The metaphysical argument by which Alexander tries to establish the locus, so to speak, of deity in the scheme of things may be briefly outlined as follows: He conceives the universe as in process of evolution, creatively bringing forth qualities which are not only new, but form a hierarchy, an ascending scale of perfection. Not to go back to the beginnings in "space-time," which, for all Alexander's skill in exposition, are very obscure, we may enumerate

first the secondary qualities, then life, then mind, as to date the latest stages in this evolution towards greater perfection. " Deity " is the next level of perfection, in the birth-throes of which the world is now travailing. It follows that " God," as the possessor of the quality of deity, does not yet exist. He is only about to be. " God is the whole world as possessing the quality of deity. . . . But this possessor of deity is not actual but ideal. As an actual existent, God is the infinite world with its nisus towards deity, or, to adapt a phrase of Leibniz, as big or in travail with deity." Religion is our sense of participating in this creative nisus of the world towards becoming God. In us, in fact, this nisus is at its intensest. Mind is, so to speak, the growing-point towards God. There lies the solid certainty and significance of religion.

Fascinating as is in many ways this essay in theology, and concordant, too, in its emphasis on the reality of time, on creative evolution, on progress towards perfection, with marked tendencies of modern thought, yet most critics have been puzzled whether to take it seriously. And rightly—for it breaks, in effect, with every great historical religion. It satisfies neither the theist nor the absolutist. For, the one holds that God is real here and now, and the other says the same of the perfection of the universe. In this, both of them seem truer than

Alexander to the deliverances of the actual religious consciousness, which is fundamentally an attitude, not towards a reality about to be, but towards a reality which endures and is, in fact, " eternal."

7. Our survey of contemporary philosophy of religion would be incomplete without a brief mention of the problem of immortality.

Traditionally, immortality stands next to the existence of God among the truths which religion is held to guarantee, and with the defence of which its own existence is held to be bound up. But it must be recorded that, on the whole, recent philosophy does not assign to immortality so central or fundamental a place. In fact, nothing is more striking than the hesitancy and almost lukewarmness with which the subject is handled. It is not uncommon even for those who, like McDougall, defend the belief in immortality, to disclaim any personal desire for it. Even Webb makes a somewhat wry face over it and confesses to " a prejudice against a belief which jars upon and distresses my imagination and from the consideration of which my mind has an instinctive tendency to turn aside." Survival, in fact, for some of the most thoughtful modern minds has ceased to be a thing to be confidently expected and longed for : it has become a mere possibility not infrequently contemplated

with aversion. Apart from neo-scholastic thinkers, no philosopher now thinks of deducing immortality *a priori* from the definition of the soul as a single, indivisible, indestructible spiritual substance. Few philosophers share McDougall's view that belief in survival is essential to morality. The attempts to obtain direct evidence of survival from communications with " departed spirits " through mediums, even supposing such evidence genuine, are commonly recognized as alien in spirit to religion, though Sir Oliver Lodge and many others think otherwise. The advance in scientific knowledge of the bodily basis of consciousness has greatly increased for us the difficulty of accepting survival as a fact. In general, a philosopher will make his assent to the doctrine depend very largely on the *nature* of the supposed life after death. But this question takes us either into a region of more or less mythological speculation—reincarnation, transmigration of souls, resurrection of the body, and so forth—or else brings us back in imaginative form to the fundamental problem, What *kind of* life is truly worth living? But once we ask what the values are which make existence supremely desirable and satisfying, we may be led on to consider, on the one hand, whether these values are not within our reach here and now, in " this life," and, on the other, whether what we care about fundamentally

is not the survival, or eternity, of these values rather than the survival of our personal selves. Some such shift of emphasis is noticeable in Webb's remark that " the only form of the hope which it is profitable to indulge is that which is directed, not upon our own eternal life, but upon God's ; and only upon our own as involved in his." And Bosanquet, accepting the consequences of his whole position, directly declares that the criticism of our desires which makes clear to us what as reasonable beings we really want, leads us, not towards the prolongation after death of our individual existences, but towards the assurance that the fundamental values are " eternally real in an ultimate being and in the universe of appearances."

Time and eternity, the transitory and the enduring, that which passes and that which is stable—these are for us moderns, as they were for the ancient Greeks, two of the poles round which our thought revolves. Whether the individual self is transitory or enduring, that is the problem of immortality. On the whole, modern philosophy seems as profoundly impressed with the transitoriness of human life in the succession of generations, as with the presence in that life of something which is untouched by time or death. What this something may be has been variously defined, from soul-substance to eternal values. Different thinkers

will, no doubt, continue to estimate these alternatives differently. But it is not a bad view which bids us, rather than fix our hopes upon the future beyond death, to remember that we are mortal and to seize our opportunity here and now of filling our lives with the things that are eternal.

BIBLIOGRAPHY

The literature on the philosophy and psychology of religion is so extensive as to make it more than ever necessary to warn the reader that the following list is only a selection, though it includes, among others, most of the books from which the lecturer is conscious of having learnt to appreciate the philosophical problems which religion raises.

1. Alexander, S. *Space, Time and Deity*. (Macmillan & Co., 1920.)
2. Bosanquet, B. *The Value and Destiny of the Individual*. (Macmillan & Co., 1914.)
3. Bosanquet, B. *What Religion is*. (Macmillan & Co., 1920.)
4. Hocking, W. E. *The Meaning of God in Human Experience*. (Yale University Press, 1912.)
5. James, William *Varieties of Religious Experience*. (Longmans, Green & Co., 1902.)
6. James, William *The Will to Believe*. (Longmans, Green & Co., 1903.)
7. James, William *A Pluralistic Universe*. (Longmans, Green & Co., 1909.)
8. Pringle-Pattison, A. S. *The Idea of God in the Light of Recent Philosophy*. (Oxford Univ. Press, 1917.)
9. Webb, C. C. J. *Problems in the Relations of God to Man*. (Nisbet & Co., 1911.)
10. Webb, C. C. J. *God and Personality*. (George Allen & Unwin, 1919.)
11. Webb, C. C. J. *Divine Personality and Human Life*. (George Allen & Unwin, 1920.)

12. Merz, J. T. *History of European Thought in the Nineteenth Century*, Vol. IV. (W. Blackwood & Sons, 1914.)
13. Merz. J. T. *Science and Religion.* (W. Blackwood & Sons, 1915.)
14. Ward, James *The Realm of Ends.* (Camb. Univ. Press, 1911.)
15. Sorley, W. R. *Moral Values and the Idea of God.* (Camb. Univ. Press, 1916.)
16. Royce, J. *The World and the Individual*, 2 Vols. (Macmillan & Co., 1904.)
17. Royce, J. *The Problem of Christianity*, 2 Vols. (Macmillan & Co., 1913.)
18. Balfour, A. J. *Theism and Humanism.* (Hodder & Stoughton, 1915.)
19. Höffding, H. *Philosophy of Religion*, tr. B. E. Mayer. (Macmillan & Co., 1906.)
20. Galloway, G. *Philosophy of Religion.* (T. & T. Clark, 1914.)
21. Collingwood, R. G. *Religion and Philosophy.* (Macmillan & Co., 1916.)
22. Rashdall, H. "Personality, Human and Divine," in H. Sturt, *Personal Idealism.* (Macmillan & Co., 1902.)
23. Martineau, J. *A Study of Religion.* (Oxford Univ. Press, 2nd Edit., 1900.)
24. Radhakrishnan, S. *The Reign of Religion in Contemporary Philosophy.* (Macmillan & Co., 1920.)
25. Pratt, J. B. *The Religious Consciousness.* (Macmillan & Co., 1920.)
26. Stratton, G. M. *The Psychology of the Religious Life.* (George Allen & Unwin, 1917.)
27. Von Hügel, Baron F. *Essays and Addresses on the Philosophy of Religion.* (J. M. Dent & Co., 1921.)

The views of Alexander (No. 1), Bosanquet (Nos. 2, 3), Hocking (No. 4), James (Nos. 6, 7), Pringle-Pattison (No. 8), Webb (Nos. 9, 10, 11), Ward (No. 14), Rashdall (No. 22), have been touched on in the text. But I would draw special attention to chs. viii–x in the second volume of Bosanquet's Gifford Lectures (No. 2). The psychology of religion was, as our American friends would say, "put on the map" by James's *Varieties* (No. 5). Its closing chapter (ch. xx), with its use of F. W. H. Myers's concept of the "subliminal" to explain the

contact of the individual mind with the cosmic consciousness, has given a powerful influence to the tendency to regard religion as close to the primitive moving-forces of life, to the *élan vital*, to the *libido* of the Freudians (of which it is in varying degrees the sublimation), to the instincts many of which it synthesizes within itself (cf. W. McDougall, *Social Psychology*, ch. vii). Among the numerous American books on the psychology of religion, those by Pratt (No. 25) and Stratton (No. 26) are perhaps the best. The former especially is to be recommended. Merz's account (No. 12) of the philosophy of religion during the last century is full of learning. No. 13 brings out the importance, for the development of a theistic religion, of the fact that *persons* are the first objects to be discriminated by the child. No. 14 contains a typical exposition of the grounds for a " spiritual pluralism," i.e., for maintaining the ultimate distinctness (and therefore finitude) of individual minds, human or divine. C. A. Richardson's recent *Spiritual Pluralism* (Camb. Univ. Press, 1920) is another good statement of the same type of view, whilst No. 24 is a lively criticism of " pluralistic theism " in favour of " monistic idealism." Sorley's book (No. 15) is especially valuable for making conveniently accessible much of the work which has been done of recent years on the theory of value. In No. 16, Royce expounds his own version of the type of " idealism," which identifies the " Absolute " of philosophy with the " God " of religion, and he argues for the immortality of individual souls as each embodying an eternal purpose of God's. In No. 17 he finds the essence of religion rather in participation in the life of the " beloved community " and, consequently, emphasizes in Christianity rather the Church than, as is usual in Protestantism, the personality of Christ. Collingwood's essay (No. 21) is fresh and thoughtful, and deserves much more notice than, owing to its appearance in the midst of the war, it has received. Its " realistic " position, however, no longer represents its author's present views. In No. 18 Mr. Balfour, with matchless dialectic, once more tears down " naturalism," in order to erect theism in its place. But the critical part of his argument far outweighs the constructive. Martineau (No. 23) was a religious genius and so is von Hügel (No. 27), and what they have to say on religion is said at first hand, and will always remain worth reading. Nos. 19 and 20 are both competent and instructive general treatments of the problems of the philosophy of religion.

In general, the reader should bear in mind that there is no

subject on which it is more important that he should, whilst studying all views, use his own judgment in selecting that view which seems to him best to interpret his own religious life. But the existence of other views should help to remind him how many are the forms of religion, and how necessary are mutual sympathy and tolerance.

INDEX

PRINTED BY
JARROLD AND SONS, LTD.,
NORWICH

Hoernle.
Matter, life, mind and God.