

IQBAL
ON INNER
RELIGIOUS EXPERIENCE
(REVISITED)

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T. I; S. I

IQBAL ACADEMY PAKISTAN

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Contents

Prologue — (1-14)

Chapter-I

Insight — (15-36)

Chapter-II

The World of Physics — (37-66)

Chapter-III

The Mystique of Consciousness – I — (67-84)

Chapter-IV

The Mystique of Consciousness – II — (85-111)

Chapter-V

The Biophysics of Consciousness — (113-140)

Chapter-VI

A Unified Theory of Consciousness - I
(Prelude) — (141-166)

Chapter-VII

A Unified Theory of Consciousness – II
(Synthesis) — (167-209)

Dedicated to the memory of

Allama Muhammad Iqbal

PROLOGUE

Iqbal's *Reconstructions of Religious Thought in Islam* is a kind of paradigm shift in the history of Islamic thought. The book is based on the lectures delivered in Madaras and at Aligarh Muslim University. It was written at a time when the Muslim nations were under the yoke of western servitude. The lament of Iqbal on this count is evident both from his poetry and prose. The lectures were delivered with succinct intention of changing the mind set of Muslims all over the world. It was a kind of a reminder to the Muslims that they have ceased to march with time in periods of almost explosive advancement of knowledge in arts and sciences. Even today, in spite of the resurgence of Islam, the real spirit of religion remains elusive. This has caused a serious misunderstanding of the very genesis of the teachings of Islam with the followers of other religions, giving rise to an inadvertent notion of clash of civilizations (Huntington, 1990)¹. Although a huge number of publications on Iqbal have appeared in the last five decades, yet the real message of Iqbal has not been able to find adequate space in the intellectual crevices of the common man, especially the emerging youth. The modern day concrete mind continues its search for answers to difficult issues interpreted in the classical pristine mode by theologians. The "double bind" unleashed by expanding frontiers of science and technology on the one hand, and *status quo* implicit in classical Islamic teachings of theologians on the other hand, has retarded the progress of Muslim societies. Accordingly, the social capital as an adjunct of human capital has failed to produce the desired results, that is, a coherent development

of civil societies, including that of Pakistan. Attempts to reform Muslim societies have mostly relied on pseudo-liberal theological approaches set in motion by fundamentalist religious groups in various parts of the Muslim world. Apparently, unlike the West, none of these movements, in Egypt, Algeria, Pakistan, Sudan and elsewhere have been able to catalyze the real renaissance in Islam (Sayed, 1990).² This be so, it becomes increasingly important that the message of Iqbal is given the importance it deserves in reconstructing the social fabric of Muslim societies in the 21st century. It is obvious that with information technology revolution ensuing on the heels of agricultural and industrial revolutions, the Muslim youth is exposed to new and diverse sources of knowledge. This has changed the predicament of the concrete mind. Thus, in spite of his firm faith in the revealed knowledge, the modern Muslim continues to ask searching questions which are apparently contraindicated in purely theological lexicon. The present book is a small effort to enable the thinking youth and the concrete mind to seek answers to some of these questions.

In the *Reconstruction*, Iqbal uses essentially the metaphysical schema leavened with the known scientific facts of his time to reinterpret some of the major religious issues which inherently have been presented in the classical mode by theologians with little regard to possible alternate explanations advanced in the light of new and expanding sources of knowledge. Iqbal predicted that *"The day is not far off when religion and science may discover hitherto unsuspected mutual harmonies. It may, however, be remembered that there is no such thing as finality in Muslim thinking. As knowledge advances and fresh avenues of thought are opened, other views, and probably sounder views than those set forth in these lectures are possible. Our duty is carefully to watch the progress of human thought and to maintain an independent critical attitude towards it"*. Taking lead from these views of Iqbal, an attempt has been made to collect current evidences from science, philosophy, psychology and biology to fortify the arguments of Iqbal in the most difficult area of 'Inner

Religious Experience'. Such an attempt entails the encompassing of a host of related issues such as (a) the nature of soul, (b) the survival of soul after death, (c) the freedom of ego, (d) the mind-body dualism which originated with Descartes' declaration: "I think therefore I am", (e) the nature of serial time in juxtaposition to Divine time and Divine space, (f) the relationship of consciousness and ego, that is, how in the unity of life, higher consciousness carves out a path for unfolding the nature of ego (g) the nexus of thought and being (h) the genesis of man's relations with the universe, and (i) the opposing claims of dualists and monistic materialists (reductionists).

Philosophical approach, relying on metaphysical arguments alone, obviously, cannot satisfy the modern man in this age of information explosion. For this reason unless metaphysics is made an ally of recent researches in physics, psychology and biology, there will be little room for sanctifying the revealed knowledge for the common good of man. In search for evidences from these sources, a diverse matrix converging on a single theme from the *"Reconstruction"*, that is, Inner Religious Experience has been constructed as dictated by the currently available information from different sources. In recent years a voluminous literature has appeared on the subject of consciousness. This literature from physicists and psychologists has illuminated the field both by proponents of dualism and monistic materialism with equal avidity. The book discusses the arguments drawn from both the sources and Iqbal's concepts in the perspective of these fresh arguments.

The West has entered into a post modern era. The Muslim nations are as yet lingering on the margin of modernization. The path to modernization, and subsequently to post modernism is tortuous and is beset with arduous engagements by intellectually robust members of Muslim societies for guiding the common man in this direction. Historically, the cultural and intellectual role of religion has, of course, been drastically affected by the secularizing and

pluralistic developments. It has been assumed especially by theologians that in such an event the institutionalized role of religion will decline. This, it is claimed, has indeed happened in the West. However, benign interpretation of Iqbal's message would indicate that in Muslim societies an effective 'double bind' can be sustained, provided man learns to live soulfully. There is no reason that religious sensibility itself will not be revitalized by acquisition of rising tide of science and technology. Furthermore, the main sources for such a development are seemingly embedded in new forms of expressions and illuminations ranging from mysticism, self exploration and liberation of theology as proposed by Iqbal. The present day spiritual anomie, it is hoped, will be discouraged by new forms of religious orientation culminating in a different form of spiritual autonomy if the world view of Islam is not subjected to a kind of contraction preached by theologians. Even in the post modern era, we understand, the search for reality far transcends the grasp of any one intellectual approach, namely, science or religion or philosophy. And for this reason the world view of science alone is not sufficient. Accordingly, a synthesis of all contemporary disciplines as related to religion, philosophy and science has to be carried out in search for truth and reality. This is precisely what Iqbal has emphasized in the *Reconstruction*. The same question has been addressed more exhaustively in the present book. The range of information being made available in this book is multidisciplinary. Hopefully, this will encourage the concrete mind to assimilate the true nuances of religion in sympathy with recent advances in knowledge. It must be realized that "contemporary science has itself become self aware and self-critical, less prone to a naive scientism and, more conscious of its epistemological and existential limitations. Nor is contemporary science singular having given rise to a number of radically divergent interpretations of the world, many of which differ sharply from what was previously the conventional scientific vision" (Tarnas, 1993).³

The 'double bind' calls for the realization of mutually contradictory demands, which apparently are difficult to imbibe. Bateson has assigned various reasons to such a phenomenon (Bateson, 1972, 1979)^{4,5}. The Muslim nations are victims of the same phenomenon. The major challenge therefore is to accommodate the opposing forces, subjecting them to a searching analysis and resolving them through flexible doctrines compatible with the revealed knowledge. It is through such resolution that the whole fabric of Muslim society can be reconstructed. This is a *sine qua non* for its coherent development and honorable survival in the 21st century global environment. Such flexibility is necessarily dictated by the emerging social milieu. Some portions of this book, especially relating to consciousness, are likely to illuminate this aspect. This has been done in the context of Iqbal's views in the *Reconstruction of Religious Thought in Islam* and the contradictory information which human mind receives with respect to the world affecting his psychology and spiritual sense of incoherence with the scientific derivations. This has been done within the ambit of his epistemological communication and existentiality. Taken together, the book emphasizes that "our psychological and spiritual predispositions are absurdly at variance with the world revealed by our scientific methods" (Tarnas, *op.cit.*)⁶. The unified theory we are proposing has, to possible extent, attempted to resolve this problem.

Iqbal, after journeying through the Eastern and Western philosophies, and studying the rise of Western civil societies, came to the conclusion that Muslim civil society needs a fresh wave of *Reconstruction*. Indeed, he desired that a positively posited social capital should be accumulated along with the development of human capital. The statement of Iqbal:⁷ *Religion is not a departmental affair, it is neither mere thought, nor mere feeling, nor mere action, it is an expression of the whole man.*" indicates as to how the 'double bind' in the modern times can be sustained and promoted for achieving positive results in a Muslim civil society. This does not necessarily mean that one

has to have the proclivity for the spurious elements of Western culture.

The above statement indeed reflects on the evolution of a balanced Muslim society. However, in addition to whatever has been discussed in the *Reconstruction*, it remains to be examined as to what other variables contribute to its positive evolution in the light of revealed knowledge and the accumulation of new knowledge. It is now generally agreed that notwithstanding the accumulation of physical capital and human capital; social capital creates a profound effect on civil society. The difficulty, however, is that it has both positive and negative externalities. The positive attributes of modern civil society include altruism, philanthropy, networks, trust, democracy, individual freedom (under the commonly agreed legal framework), accountability, and free market economy. These are all "epiphenomenal" arising as a result of social capital (all in line with the spirit of Islam). The negative externalities in a narrow sense originate from religion, traditions and culture; invariably culminating in a shrunken world-view, theological tyranny, deficit democracy, extremism (as has been witnessed in recent decades), ethnical divide, and resistance to economic modernization which is deemed to be antithetical to traditional cultural values. Thus, in the development of a balanced civil society only such social capital can be allowed to permeate the society which has documented positive traits, germane to religious ethos (e.g. moral values). Accordingly, it is reasonable to address the question— as to where does the social capital come from? Indeed education is the main source. Yet, because of various reasons, public policy is likely to have little effect in this regard. But, states can encourage creation of positive social capital by efficiently providing necessary public goods such as public property rights and public safety. Further, in order to eliminate the negative impact of social capital, the state may not undertake activities that are best left to the civil society. All these aspects related to positive social capital can be read between the lines of what Iqbal has stated in the *Reconstruction*,

be it mysticism, the nature of soul, free will, human consciousness (ego) and man's lust for material gains. Man, as Iqbal says, must re-learn to live soulfully. The beautiful expression of Will Durant⁸ that "Societies are poisoned not by oxide of mercury but by silver and gold" reinforces the concept of Iqbal.

Looking at the state of civil society in Pakistan, it is not difficult to proclaim that Pakistani civil society is in shambles. Now, nearly for five decades, the negative attributes of social capital generated by a vocal minority through pristine theological edicts in one form or the other has retarded the progress of the civil society. Ethnic and social divide are a direct consequences of this negativity. So is the case with religious extremism. This is coupled with other factors such as nepotism, corruption, bribery, unemployment, low literacy rate, scant respect for merit, lack of equal opportunity, human freedom, poverty, flawed education system, deficit democracy, tyranny of landlords, human abuse, unenviable legal system and un-responsive civil service adding up to disengage government. It appears that there is along journey to restructuring the civil society and accumulating positive social capital. In this regard, there are some encouraging indications, however. As Muslims we have to follow the edicts of the Holy *Qur'an*, as revealed to our Holy Prophet. The Holy *Qur'an* declares that "Man has been created in the best of forms" for this we should thank Him and bow before Him. At the same time God has given us the creative abilities which we must use for advancement of knowledge. The Prophet of God prayed again and again "Oh, God give me the ultimate knowledge of things". In the same vein Iqbal addresses God and says "You created the night, we created the lamp; You created poison and we converted the same for use as a remedy of diseases". All this means, as *Reconstruction* preaches, that the only path for achieving the objective of developing a balanced civil society lies in (a) the dictum that man should begin to live soulfully and follow the Islamic ethos of love, respect, brotherhood, integrity, honesty, justice,

tolerance and spending his material wealth in the way of God; (b) binding himself at the same time to those principles of Islam which are mandatory for each Muslim and (c) using his creative abilities (with which the human species has been endowed) to generate new knowledge for the benefit of mankind. This is what Muslim society is not practicing at present. The message of Iqbal conveyed through the *Reconstruction* is a means to achieve this objective if we bring home to the modern youth Iqbal's concern for reshaping the civil society. This calls for generating a common consciousness and common ego. Our energetic young generation is endowed with a robust genetic pool. It possesses an IQ which can be favorably measured on the touchstone of international standards. Generally, philanthropy and volunteerism are available in abundance. So is our respect for globalization, appreciation for free market, equal opportunity and longing for truly accountable democratic institutions. In addition, the Pakistani society is clamoring for knowledge-based society which may cause economic development for the benefit of all strata of society.

Given the present state of Muslim Ummah in general, and Pakistani society in particular, one may raise the question: Is Islamic Renaissance possible while keeping in sight the genesis of Western Renaissance and the thesis of Iqbal as expounded in the *Reconstruction*? In this regard, three discourses of Iqbal, namely, (a) 'Knowledge and Religious Experience', (b) 'The Spirit of Muslim Culture', and (c) 'Is religion possible?' are highly illustrative for the concrete mind. Certainly, the contents of these discourses deserve a wide spread assimilation by our youth. It however, should be interesting to know as to how Renaissance progressed in the West. This is well documented in literature. Briefly, it may be noted that initial leavening for the onset of the process of Western Renaissance was catalyzed by (a) Masterly works of Leonardo, Michael Angelo and Raphael; (b) the discovery of new world, (c) the rebellion of Martin Luther against the Catholic Church, (d) the Hypothesis of Copernicus that

'universe is heliocentric' and (e) setting in motion the Scientific Revolution. Thus began the numinosity of Renaissance man, letting loose the process of secularization and his capability of penetrating and reflecting on secrets of nature thereby leading him to the defiance of traditional authorities and truth based on his own judgment. In short, no domain of knowledge, creativity and explosion seemed beyond man's reach. All these developments were not alien to Muslim culture when we look back and study the works of early Muslim Philosophers. The only difference is, as Iqbal states 'that in addition to the Holy *Qur'an* there are two more sources of knowledge, that is, Nature and History'; and it is in tapping these sources of knowledge that the spirit of Islam is seen at its best. Furthermore, Iqbal brings home to the concrete mind that "according to the teachings of the *Qur'an*, the universe is dynamic in its origin, finite and capable of increase". This calls for the study of nature in the same fashion as has been undertaken by the West. Indeed this is the 'real spirit of Islam; both *Anfus* (self) and *Afaq* (world) are sources of knowledge.' History tells us that Roger Bacon's conception of science emanated from his scientific training in the Muslim universities of Spain. All this means that Muslims have to revitalize themselves for an onslaught on unraveling the mysteries of nature as has been the order of the day in the Western society for the last 200 years. The only difference which Iqbal identifies in this regard is that Muslim society can not divest itself from the true spirit of the teachings of Islam. Unlike the West the Muslim societies have to find a synthesis of the religious and the secular (a form of Islamic social welfare state). This is why the Prophet of God declared, "This world is a big Mosque". To achieve this objective the Renaissance man has to become an adventurer and a genius in all aspects of life, yet, adhering to Islamic ethos as part of his cultural and social heritage.

Keeping the plight of Muslims in view, Iqbal has searched for the basic tenets, which could cause real Renaissance in Islam. For this Tarnas (op.cit)⁹ like Iqbal states that man has

to be self-conscious and autonomous, curious about the world, confident of his own judgments, skeptical of ritualistic orthodoxies, rebellious against authorities (theological tyranny), responsible for his own belief and actions, enamored of the classical path and even more committed to a greater future, proud of his humanity (based on Islamic ethos), conscious of his distinctness from nature, aware of his artistic powers as individual creator, assured of his intellectual capability, and in Iqbal's words 'learn to live soulfully'. To be able to surge on the wave of this Renaissance, it is imperative as Iqbal advocates that the Muslim mind has to envision a restructured religion, and be a part of the scientific revolution. In doing so the hegemony of purely theocratic approaches to religion on the dogmatic side has to be dispensed with. Obviously, in this process there will be a merging of religious and the secular as dictated by the modern age.

The paradigm shift proposed by Iqbal in the *Reconstruction* is in line with historical developments of similar nature, initiated by Greek Philosophers, earlier Muslims philosophers, and Descartes. On the scientific side, the same is true in case of Newton, Einstein, the Copenhagen group (Bohr, Dirac and Heisenberg who masterminded the theory of quantum physics), to which repeated references have been made by Iqbal. The essence of Greek philosophers, as Iqbal states, was purely speculative. Inherently, this was against the dynamic spirit of Islam. Iqbal was not convinced of the philosophical approaches of Eastern philosophers who approached the Islamic thought essentially taking lead from the speculative Greek philosophy. In this context Iqbal's *Reconstruction* is a major departure from the Archetypal, yet keeping in sight the expanded world view of Islam. Like other paradigm shifts Iqbal's *Reconstruction* presents a stage in the unfolding of evolutionary sequence in the history of Islamic thought *vis-à-vis* a rise of metaphysical approaches in the Christian West. In general, when each a paradigm shift is exploited to the full extent it loses its numinosity. As such it

becomes oppressive, limiting, opaque and something to be overcome. Unfortunately, the views expressed by Iqbal in the *Reconstruction* have never been applied with the intensity they deserve to bring about the desired mind shift for preparing a real Renaissance man for restructuring the Muslims societies in agreement with the evolving social and cultural change along with advancing frontiers of knowledge. Iqbal has tried to find empirical, epistemological justification in support of his proposed sociological change. He obviously desired that interpretive process of the revealed knowledge, as advocated by him, should be able to transform the psychological predisposition and metaphysical assumptions of collective Muslim consciousness. In fact, Iqbal's thoughts present a gestalt change both subjectively and objectively which are still waiting for a cultural re-making of Muslim societies. It may be noted that science and technology are not value neutral. As more knowledge is accumulated in the wake of scientific revolutions, the social and cultural aspect will evolve in agreement with the same and carve out new avenues of change. This simply means that changing metaphysical perspective and epistemology will cause the emergence of a global experiential quantum jump in reasoning, observation and expression of philosophers. Iqbal's *Reconstruction* is a product of the same vision. Indeed, Iqbal, according to his judgment provided a way out for Muslim societies infested with incoherence and depression bordering on degradation.

The great epistemological journey of the Western mind from the birth of Philosophy out of the mythological consciousness in ancient Greece, through the classical, medieval, and modern ages to our post modern age has restructured the human thought in the West culminating in the post modern mind. This, according to Tarnas, (1993)¹⁰ "has been possible due to the extraordinary succession of world views (paradigm shifts), the dramatic sequence of transformation in the human minds apprehension of reality, the mysterious, the evolution of language; the shifting of relationship between universal and particular, transcendent and immanent, concept and precept, conscious and unconscious, subject

and object, self and world—the constant movement toward differentiation, and the gradual empowerment of the autonomous human intellect, the slow forging of the subjective self, the accompanying disenchantment of the objective world, suppression and withdrawal of the archetypal, the constellating of the human unconscious, the eventual global alienation, the radical deconstruction, and, finally perhaps, the emergence of a dialectically integrated participatory consciousness connected to the universal. The Muslim societies have yet to go through this process. However, Iqbal takes exception to this ‘meta-trajectory’ by introducing the concept of unity of life and Directive Energy (*Amr Rabi*) as compelling forces for the change of Muslim mind set in the rise of Renaissance in Islam. This is how he solves the problem of ‘double bind’ in which presently, the Muslim world is caught. In fact, Iqbal has been searching for the dignity of man’s relationship with God and his place in the cosmos, (cf, *Reconstruction—Knowledge and human experience*).¹¹ For this Iqbal emphasizes the use of human intellect, higher consciousness (inner religious experience), freedom of will and independent individual ego as a continuum of the Infinite in the making of the Muslim society. Given all this, time seems ripe that Iqbal’s paradigm shift within the framework of revealed knowledge is captured in the logical net of science and psychology for *Reconstruction* of Muslim society. These aspects find expression in this book especially in the chapters on ‘The Mystique of Consciousness’. In further evolution of Muslim societies, the more the Iqbal scholars attend to the reformatory portfolio put together in the *Reconstruction*, the more intense will be the impact of Iqbal’s message for the benefit of common man.

It is hoped, that the book will provide a substantially new material for further debate on the subject of so called subjective ‘inner religious experience’ which in the light of modern researches has been shown to be no different from the verifiable normal experience (the word view of positivist). In the making of this book I have been helped by several of my colleagues from the fields of philosophy, psychology and sciences. In particular, Dr. Wasim Qazi Professor of

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CHAPTER – I

INSIGHT

When our Poet–Philosopher Allama Iqbal articulated his lectures on *The Reconstruction of Religious Thought in Islam*, he used epistemic arguments drawn from religion, philosophy and science. The lectures, subsequently published in the form of a book,¹ remain a major advancement in our understanding of religious thought in Islam. The illuminating and thought provoking contents of the ‘Reconstruction’ have been the subject of extensive studies in the last five decades. Not surprisingly, “The principle of movement in Islam” has attracted high attention both of theologians and scholastics with equal avidity. However, a generic understanding of esoteric Islam, expressed as “inner religious experience” finds a more rigorous analysis in several of his other lectures (See, for example, “Knowledge and Religious Experience”, “The Human Ego– His Freedom and Immortality”, “Philosophical Test of Revelations of Religious Experience” and “Is Religion Possible?”)². In the opinion of some scholars, and even Iqbal himself, Islamic thought needs to be continually revisited in light of advancing frontiers of knowledge. In his preface to the *Reconstruction*, Allama observes: “It must, however, be remembered that there is no such thing as finality in philosophical thinking, as knowledge advances and fresh avenues of thought are opened, other views, and probably sounder than those set forth in these lectures, are possible. Our duty is carefully to watch the progress of human thought; and to maintain an independent critical attitude towards it; ... It is likely that religion and sciences may discover hitherto

unsuspected mutual harmonies." He was right. With the kind of new information now available from physics, biology and psychology, the time seems ripe to recapture the vision of Iqbal and examine with succinct subtlety whether the edifice prepared by Iqbal can be further fortified and measured favourably on the touchstone of knowledge, generated by modern sciences during the last seven decades. There is little doubt that intuitive prediction of Iqbal was positively posited in this direction.

The age in which Iqbal lived was one of rapid, if not convulsive changes in science and philosophy. It was a period which Tarnas (1991)³ describes as "The Post-Copernicus Double Bind", who legitimately postulated that the Earth was not the absolute fixed center of the Universe—a scientific truth of universal importance. The result was the dawn of a new era in modern cosmology and astronomy. This major paradigm shift decimated the pristine naïve understanding about the relationship of the planet earth with the rest of the universe. So was the rise of modern man for whom space was created for the ideas put forth by Kepler, Galileo and Newton. The realization gained strength that man occupies a relatively peripheral position in a vast and impersonal universe. This ushered in a new era of disenchantment with the universe, beset with serious implications for philosophy. Descartes⁴ delving deep into the Copernican insight declared that Self by design is distinct and separate from an objective external world. This major advancement in human thought culminated in a period of enlightenment taking the shape of empiricist philosophy, spearheaded, among others, by Locke⁵ and Hume.⁶ Accordingly, man was relativised as an inhabitant of a tiny planet within a vast universe. Mind was considered as different from the external world implying that it can have access only to its own experience. The world is simply an interpretation of human mind which can only experience phenomena, not things in itself. Nor can it claim "direct mirror like knowledge of the objective world; since the knowledge it experiences has already been structured by the subject's own

internal organization. "All human knowledge was interpretive (Kant).⁷ This is what is termed as Kant's "epistemological schism."

On the top of all this came the evolutionary theory of Darwin (1859).⁸ Man was no special creation. It, like any other living organism, was the epiphenomenon of evolution. The theory was based on such premises as over production, struggle for existence, natural selection and survival of the fittest. Nature for him was not anything transcendental. It was inherently a part of physical and biological world unattended by the genius of "Active Intellect". Variations arise through genetic recombination during the process of reproduction: Only those variations are selected by nature which increase the survival value of human species (an important issue which will be discussed in a subsequent chapter). By the same period man started reinterpreting the world view under the spell of laws of classical physics, which included Newton's laws of motion and gravity, Maxwell's laws for the electromagnetic field, which incorporate electricity, magnetism and light, and Einstein's theories of relativity—the special theory which deals with large velocities, and the general theory which deals with large gravitational fields. These laws are all stated to be deterministic.

In this perspective, it would be worthwhile to glance briefly through the foresight of Iqbal when he was contemplating about the themes for the *Reconstruction*. As a keen student of philosophy, he approached metaphysics in juxtaposition to the edicts of the Holy Quran. Probing deep into the meaning of the holy verses, he developed an outlook which combined permissible metaphysical positions taken by Western and Eastern scholars in support of Divine Message. Standing on the pedestal of his own intellect, his concrete mind, in clear contrast to pure theologians, carved out a fresh understanding of religious thought with a hindsight on perennial decadence of Islam. He was hoping, and rightly so, that through his writings he will bring about a change in the

mind set of Muslims. Perhaps, he desired the rise of a Muslim renaissance man.

He was an ardent observer of changes taking place in the West. The Christian mind was emancipated from the slavery of Church, partly due to scholastic theology (Ferguson)⁹ and partly due to the virus of renaissance let loose by reformation (Martin Luther).¹⁰ This was catalyzed by scientific revolution fomented by the works of Copernicus, Galileo and Newton in sympathy with rhapsodic philosophical upsurge led by Bacon¹¹ and Descartes¹². The newly self conscious and autonomous human being curious about the world, skeptical of orthodoxies, and, assured of his intellectual capacity to comprehend and control nature must have attracted the concern of Iqbal vis-à-vis the future of Muslims the world over. The following quote from Iqbal¹³ which reflects his dismay as well as hope will further illustrate the point:

"During the last five hundred years religious thought in Islam has been practically stationary. There was a time when European thought received inspiration from the world of Islam. The most remarkable phenomenon of modern history, however, is the enormous rapidity with which the world of Islam is spiritually moving towards the West. There is nothing wrong in this movement, for European culture, on its intellectual side, is only a further development of some of the most important phases of Islam. Our only fear is that the dazzling exterior of European culture may arrest our movement and we may fail to reach the true inwardness of that culture. During all the centuries of our intellectual stupor Europe has been seriously thinking on the great problems in which the philosophers and scientists of Islam were so keenly interested. Since the middle ages when the schools of Muslim theology were completed, infinite advance has taken place in the domain of human thought and experience. The extension of man's own power over Nature has given a new faith and fresh sense of superiority over the forces that constitute his environment. New points of view have emerged. Old problems have been re-stated in the light of fresh experience, and new problems have arisen. It seems as if the intellect of man has overgrown the most fundamental categories – time, space and causality. With the advance of scientific thought even the concept of intelligibility is undergoing a change. The theory of Einstein has brought a new vision of the universe and suggests new ways of looking at problems common to both religion and

philosophy. No wonder that the younger generations of Islam in Asia and Africa demand a fresh orientation of their faith. "

The paragraph cited above has been taken from Iqbal's lecture on "Knowledge and Religious Experience." He is worried about the "intellectual stupor" of Muslim world, yet, he finds some merit in the way in which the world of Islam is moving towards the West, however, without fully understanding the operative factors underlying the rise of renaissance in Europe. This dilemma occupied his mind as he proceeded to resolve the same through an impressive array of ideas. In doing so, he turns to a few Muslim scholars of ninth to twelfth century. He makes a specific mention of the schools of thought propounded by Ibn Rushd (known in the West as Avorres), the Asharites, and Al-Ghazali. Dismissing the rationalist extremes of Ibn Rushd, he tends to have sympathy for calling Ghazali's mission as apostolic, he compares him with that of Kant in Germany in the Eighteenth century. Accordingly, in his opinion, "Ghazali's philosophical skepticism, which, however, went a little too far (an under statement!) virtually did the same kind of work in the world of Islam in breaking the back of that proud and shallow rationalism which moved in the same direction as pro-Kantian rationalism in Germany."¹⁴ Iqbal, however, locates one important difference between Kant and Ghazali, whereas Kant was unable to affirm the possibility of a knowledge of God. Ghazali on the other hand losing "hope in analytic thought moved to analytic experience and then found an independent content for religion."¹⁵ Iqbal's tilt towards Ghazali, though not without guarded criticism is understandable if we relate it to Iqbal's philosophy of Self (ego), or the way he makes a case for inner religious experience (mysticism) in the *Reconstruction*.

Yet, Iqbal faces a number of difficulties in his search for finding a rational basis for esoteric Islam. Faith, which we may all agree, is unattended by intellect. Also, metaphysics provides a "logically consistent view of the world with God as a part of that view". However, the major difficulty arises in the period

of "discovery"¹⁶ which is the creative sport of a concrete mind. It is here, as Iqbal points out, that *"metaphysics is displaced by psychology and the religious life develops the ambition to come into contact with Ultimate Reality. Again, it is here that religion becomes a matter of personal assimilation and the individual achieves a free personality, not by releasing himself from the fetters of the law, but by discovering the lifetime source of the law within the depths of his own consciousness"*¹⁷ In the same vein Iqbal quotes an interesting statement from a Muslim Sufi— *"no understanding of the Holy Book is possible until it is actually revealed to the believer just as it was revealed to the Prophet."*¹⁸ In essence then, the crux of the whole issue lies with the possibility (or even mechanism) of the finite coming in contact with the infinite. In this regard, Iqbal's dismissal, unlike that of Ibn Rushd, of cosmological as well as teleological arguments is understandable. Notwithstanding this, in the realm of discovery, his arguments, as we understand, are embedded in such expressions, among others, as self, ego, intellect, concept, intuition, thought, and consciousness for comprehending the phenomenon associated with religious experience. For him, it was essentially a problem of psychology or of physics, which at his time were in early stages of development. Today, it is different. Fresh new argument can now be stated in support of what Iqbal uncovered several decades ago. We will discuss these aspects exclusively in the chapters on – the world of physics, the mystique of human consciousness and biophysics of consciousness.

In a laser-like approach on non-conceptual modes of "experience", he draws a distinction between normal scientific experience and religious experience (non-conceptual). Both experiences are in search of truth and reality. To this extent, the two have a meeting point. However, whereas, scientific experience is principally verifiable, the religious experience cannot be subjected to the same test. This, as Iqbal thinks, is due to the reason that sufficiently sensitive techniques are yet to be discovered in the realm of psychology for measuring the nature and extent of higher consciousness in religious experience. If this be so,

as we will show later, then, one might agree to Iqbal's contention that "It may fairly be urged that in view of the more recent developments of science, such as the nature of matter as 'bottled up light waves', the idea of universe as act of thought; finiteness of space and time, and the Heisenberg's principle of indeterminacy in Nature, the case for a system of rational theology is not as bad as Kant was led to think."¹⁹ Unlike Kant, Iqbal, thinks that normal experience (scientific, empirical) is not the only knowledge –yielding experience and on this count, he quotes from the great Muslim Sufi philosopher Mohyuddin Ibn al-Arabi of Spain— "God is a precept not a concept."²⁰ Quoting from another Muslim thinker, Iraqi, he identifies with him "the plurality of space-orders and time-orders and speaks of Divine time and Divine space, inferring thereby that there are other levels of human experience systematized by other orders of space and time levels in which concept and analysis do not play the same role as they do in the case of normal experience."²¹ This means that physiological and psychological manifestations, which accompany the religious experience, cannot be captured in the "net of logical categories."

Nevertheless, without losing sight of Iqbal's basic theme on religious experience, we now ramble briefly along the scholastic ideas put up by some medieval Muslim philosophers between the ninth and twelfth centuries. This was, indeed, a period of intense scholastic activity in the history of Islam. Their works merit discussion for the reason that a number of their thoughts which stood on the edifice of rationalism are, in our opinion, likely to convey useful meaning to our search for answers to the questions raised by Iqbal. It is true that Mu'tazilite speculation in the hands of second and third generations of Mu'tazilite, under the influence of Greek Philosophy, and with the active patronage of the Caliphs, "tended to be absolutely speculative and unfettered, and in some cases led to a merely negative attitude of thought undercutting the very foundations of the faith". They made reasons the sole basis of truth and reality, making

philosophy an ally of religion, but ignoring that the basic principles of Islam, inherently are incapable of logical demonstration.²² For this reason Iqbal aptly remarked that "Mu'tazilite considered religion merely as a body of doctrines, ignoring it as a vital fact, took no notice of non-conceptual modes of approaching Reality and reduced religion to a mere system of logical concepts ending in purely negative attitude."²³ The Asharite school of thought had a partly philosophical and partly religious basis developed in the tenth and eleventh centuries. The rise of Asharism, no doubt, was a revolt against the philosophers, yet, the main purpose of this movement was "an attempt not only to purge Islam of all non-Islamic elements which had quietly crept into it; but also to harmonize religious consciousness with the religious thought of Islam. This laid the foundation of an orthodox Islamic theology or orthodox Kalam as opposed to the rationalist kalam of Mu'tazilite. The most vigorous preacher of Asharite Orthodox Kalam was Abu al-Hasan Ali bin Ismail al-Ashari. The Asharite theology contested the position taken by Mu'tazilite on all theological issues, such as (1) Concept of God and His attributes, (2) Free Will, (3) the problem of Reason and Revelation and the criterion of Good and Evil, (4) the problem of the Eternity of the Quran and (5) the problem of the Beatific vision.²⁴ Whereas on first three counts they maintained a middle position between orthodoxy and Mu'tazilite, they vehemently argued, through the power of Kalam, in favour of Revelation and Eternity of the Quran. Interesting position was, however, adopted by them on the issue of Beatific vision. They could not disagree with the contention of philosophers that whatever is extended or spatial must be contingent and temporal, and God is not an extended or temporal being to be seen. Yet, they asserted the possibility of seeing an object even if it is not present before the perceiver²⁵ (This is an extremely attractive possibility which will be brought under discussion in a subsequent chapter). Accordingly, Asharite orthodox Kalam, the Asharite metaphysics, and in particular the Asharite Atomism, to

which a reference has already been made, wielded great influence on the minds of Muslims. Greatest amongst the later Asharites was Qadi abu Bakr Mohammad bin Tayyib al-Baghdadi who made use of some purely metaphysical propositions in his theological investigations and provided the Asharite school with a sound metaphysical foundation. The Asharite atomism maintained that "the substances perceived by us are atoms which come into existence from vacuity and drop out of existence again. The world is made up of such atoms. **These atoms are not only of space but also of time, they are non material and ideal in character.** These atoms differ from Monads of Leibniz in having no possibility of self development. On this subject the comments of a western scholar are eminently interesting: "the Lucertian atoms raining down through the empty void, the self developing monads and pre-established harmony of Leibniz; and all the Kantian things in themselves are lame and impotent in their consistency besides the Parallel Asharite doctrine"; which demonstrates the unflinching exactitude of the Muslim conclusions."²⁶ (This exciting, though speculative phenomenon, will be taken up again in Chapter-3). As a consequence of the rise of Asharite theology, Greek philosophy as well as works of pioneers of Muslim scholastic philosophy were subjected to excessive criticism. As such the way was cleared for men like al-Ghazali and Fakhr-al-Din al-Razi.

Primarily, Al-Ghazali can be included among the Asharites.²⁷ It was from his pen that a systematic refutation of Greek philosophy originated, when he wrote *Tahafut al-Falsifah*²⁸ completely demolishing the dread of intellectualism imposed on the minds of the Orthodox. Naturally, more and more people turned to the study of dogma and metaphysics together. So intense was the influence of Ghazali that Asharite ideology became practically the theology of the Muslim community and has continued to remain so till the present time. Yet, we must not lose sight of the fact that there is a fundamental difference between pure Asharite orthodoxy

and the ingenious amalgamation of spiritualism and fundamentalism carried out by Ghazali, as pointed out by Iqbal. The breadth of learning and originality of Ghazali have received universal acclamation. What he taught and the works he produced, indeed, convey the powerful message that (a) placing religion only on philosophical grounds is not only unsafe but can also carry the philosopher to the brink of unbelief; (b) the dogmatic part of Islam cannot be subjected to philosophical test, and therefore can only be sustained in the lap of faith by acknowledging the authority of the Prophet and complete submission to the truth revealed in the Quran; and (c) one can approach reality through spiritual experiences (experiential actuality), though not much can be revealed to the common masses from what has been revealed. Iqbal's esotericism seems to agree with this line of thought. But in no way can his thoughts be placed under the category of orthodox Kalam. On the other hand, staying within the confines of revealed knowledge, he makes a strong case for spiritual experience. This is supported by the following excerpt taken from "the Spirit of Muslim Culture", (page 99).

"Mohammad of Arabia ascended the highest of Heavens and returned. I swear by God that if I had reached that point I should have never returned. These are the world of a great Muslim saint, Abd al-Quddus of Gangoh. In the whole range of Sufi literature it will be probably difficult to find words, in a single sentence, disclose such an acute perception of psychological difference between the Prophetic and Mystic type of consciousness. The mystic does not wish to return from the repose of 'unitary experience', and even when he does return, as he must, his return does not mean much to mankind. The Prophetic return is creative."

We do not intend to enter into controversy that raged between Ghazali and philosophers of the eleventh/twelfth century. Yet, it would be unfair if we fail to summarize, though briefly, the views of such luminaries of Islam as Al-Kindi, al-Farabi, Ibn Sina and Ibn Rushd. This we are doing for the benefit of the concrete Muslim mind which is being continually invaded by several new thoughts emerging from the expanding frontiers of knowledge. Perhaps, such a mind

may be able to find some of the answers in the thoughts of these philosophers, as well.

It cannot be ignored that medieval Muslim scholars were the great pioneers of scholastic theology in Islam. The kind of knowledge which existed at that time, apart from the revealed knowledge of the Quran, essentially, was the product of Greek thinkers translated by Syrian Christians at the School of Odessa in Mesopotamia. However, when Abbasid dynasty replaced that of Oummaides in 750 A.D., Syrian scholars were invited to the Arab Court in Baghdad who undertook, first, the translation of medical works, and then the philosophical works. By 832, a school of translators was established at Baghdad, an institution which produced Arabic versions of Aristotle and Plato and Plotinus, among others. It is therefore not surprising that medieval Muslim philosophers worked under the spell of Greek philosophy, especially Aristotle and Plato. There was nothing wrong about it, since, in all cultures, new knowledge is constructed on the foundations of a pre-existing knowledge. This be so, the comments of Iqbal reproduced below, need to be considered with some caution:

"As we all know, Greek philosophy has been a great cultural force in the history of Islam, yet a careful study of the Quran and the various schools of scholastic theology that arose under the inspiration of Greek thought disclose the remarkable fact that while Greek philosophy very much broadened the outlook of Muslim thinkers, it, on the whole obscured the vision of the Quran."

This statement from Iqbal has some justification, yet, it is beset with a number of caveats. For example, unlike Iqbal, in our opinion, there is nothing surprising in Socrates concern that "proper study of man was man and not the plants, insects and stars", if the same is considered in the context of Iqbal's own observation: "It seems as if the intellect of man is outgrowing its own fundamental categories – time, space and causality," and further, "The modern man with the philosophies of criticism and scientific specialism finds himself in a strange predicament. His naturalism has given him unprecedented control over the forces of nature."

Obviously, therefore, a distinction has to be made between primary and secondary. What is primary is an understanding of the processes of intellect and consciousness in man. Rest of the knowledge, for example, that of nature follows. A similar caveat applies to his remarks about Plato, who, he thinks despises sense perception. There is little, if any evidence to support this contention. Will Durrant (1926)²⁴ throws light on this aspect in the following words while analyzing the psychological solution offered by Plato as to what should be the qualities of people and the nature of their education if they are to rule a country:

"Therefore the essence of higher education is to search for ideas for generalization, laws of sequence, and ideals of development; behind things we must discover their relations and meaning, their mode and the law of operation, the function and ideal they serve to adumbrate; we must classify and coordinate our sense experience in terms of law and purpose." Nothing in this paragraph, in our opinion, is either mere "classical" or runs counter to the dynamic universal teachings of the Quran. It was, however, later that gentle Spinoza²⁹ would say that "there is a world of things by sense and a world of laws perceived by thought". No wonder that such hypotheses in light of new scientific discoveries are being used for describing relationship between the Platonic world and the physical world.

It is, therefore, natural that medieval philosophers of Islam studied the pre-existing Greek views and proceeded to analyze the dynamic Islamic thought in order to develop a rational basis as opposed to pure orthodoxy. By doing so, they developed an entirely different outlook for Islamic scholasticism as opposed to a rather misguided Christian scholasticism. Commenting upon this aspect Copleston (1962),³⁰ particularly with reference to Ibn Rushd, describes his impact in the following words:

"Aristotle, therefore, when he appeared to medieval Christian thinkers in the shape given him by Avicenna, for example, naturally appeared as an enemy of Christian wisdom; Christian philosophy in the wide sense. This fact explains to a large extent the opposition offered to Aristotelianism in the thirteenth century by many upholders of Christian tradition who looked on the Pagan philosophers as the foe of Augustine³¹ and Anselm³² and other great philosophers of Christianity." Even Iqbal admits that

"European culture, on its intellectual side, is only a further development of some of the most important phases of Islam."

The Arabian philosophy, as we understand today was one of the principal channels whereby complete Aristotle was introduced to the West; the Muslim philosophers were not mere transmitters of Greek knowledge, nor simple commentators; they changed and developed the philosophy of Aristotle and thus became the primary mainstay of the Western thinkers, clearing the path for the rise of renaissance man in the West. Unfortunately, as we examine deeply, there is a cross over period in which the Christian West, helped by epoch making scientific discoveries, moved from orthodoxy to enlightenment and the Muslim world from enlightenment to orthodoxy. It is true that Mu'tazilite went too far in declaring that "Part of the Quran was created and Part of the Quran was revealed," yet, there is a lurking truth in their opposition to anthropomorphism. Such, however, is not the case with Ibn-Sina, Ibne Rushid, Al-Kindi and even Al-Arabi if their thoughts are not viewed through the coloured glasses of classical orthodoxy. If anything, orthodox Kalam as it persisted closed the doors to the emergence of fresh ideas towards understanding the real significance of Islamic teachings. It has already been argued that Greek thought on which the Muslim philosophers constructed new edifice for Islamic theology was not entirely classical. Nor were these philosophers averse to the basic tenets of Islam. Why, then, an "intellectual revolt" culminating in Asharite metaphysics? It appears that it was an orthodox uprising against intellectual advancement, nurtured by the philosophers, to stonewall the true movement of thought. It, at best was an attempt to narrow down the expanding world-view of Islam and to keep it confined to the cage of orthodoxy. The victims were the minds of ignorant masses under the spell of ignorant caliphs. Whether such a phenomenon may be attributed to the Asharite school of thought or to Ghazali's despise for philosophers is of little consequence, yet Iqbal's dismay is obvious when he writes: "During the last five hundred years

religious thought in Islam has been practically stationary.”³³ Iqbal’s “*Reconstruction*” is the product of this lament.

Al-Kindi (b: 801) was an artful defender of philosophy. “He directed Muslim philosophy towards an accord between philosophy and religion. Philosophy depends on reason, and religion relies on revelation. Logic is the method of philosophy; faith, which is belief in the realities mentioned in the Quran as revealed by God to His Prophet; is the way of religion. From the very outset men of religion mistrusted philosophy and the philosophers. Philosophers were attacked for being heretics. Al-Kindi was obliged to defend himself against the accusations of religious atheism (kufr). In his turn Al-Kindi accused those religious men for being irreligious and traders with religion. They disputed with good men in defense of the extreme position which they had occupied without any merit, only to gain power and to trade with religion” (El-Ehwany).³⁴ How true even in the present day Muslim world! On this count Iqbal’s criticism of theologians is understandable.

Al-Farabi (870-950) in his scheme of categorization of knowledge assigned a separate status to philosophy. However, in no way, he intended to supplant or undermine the Islamic theology. Here we are concerned with his theory of emanation. He employed this theme to show how from the ultimate Deity or One, there proceeds an intelligence and the word - Soul. The intelligence of man is illuminated by cosmic intelligence, which is the secondary intellect of man. Though the doctrine of illumination is connected with neo-Platonism, yet, Al-Farabi himself remains attached to a mystical school or sect of Sufis, and his philosophy had a religious orientation. The highest task for man, he emphasizes is to know God.³⁵ Such was the extent of his undiluted faith.

Ibn Sina (980-1032) undoubtedly can be ranked amongst the greatest Muslim Philosophers of the Eastern group. As a precocious child he gained mastery over religious literature and sciences at an early age. Though influenced by metaphysics of Aristotle, he devised his own system which in

many respects was un-Aristotelian. His intellectual expanse can be assessed from the depth of his writings. Indeed, we cannot escape the conclusion that he was the real creator of scholastic philosophy in the Islamic world. The system of thought which he developed had a stamp of authority and originality which dominated the Islamic thought for centuries despite the attacks of al-Ghazali and Fakhr al-Razi.

We can see Platonic legacy as modified by al-Farabi in his doctrine of being, yet he presented compelling views which distinguish him from his predecessors. As an emanationist, he distinguishes between the Ultimate Being (necessary of itself) and the Contingent Being (not necessary of itself). Accordingly, the concept of ‘being’ applied to the necessary and contingent beings has not the same connotation. It is only in the Primary necessary being that essence is identical with existence predicating the contingent being. This also leads him to argue (unlike Aristotle) that chain of causes cannot be infinite, since there would be no reason for the existence of anything, but there must be a first cause which is itself uncaused. This uncaused Being is the necessary Being which cannot receive its essence from another, nor can its existence form part of its essence: if considered in parts, then it will warrant an anterior cause.³⁶

Leading a complicated array of arguments about the body mind relationship, he comes to the conclusion that mind is a substance independent of the body – “we can think away our bodies and so doubt their existence, but we cannot think away our minds.”³⁷ How similar to Descartes’ *cogito ergo sum* (I think therefore, I am).³⁸ This points to an organic relationship between consciousness and the existence of self. In Ibn Sina’s view soul is an independent substance and not a form of the body to which it is attached intimately by some kind of mystical relation. The soul is independent of anything and emerges from the separate substance of the active intelligence, simultaneously with the emergence of body. It is attached to this body with a definite temperament, a definite inclination to care for it. Further, the soul enters its indestructibility and

survival even when its body (to which it is attached) is destroyed (this may be compared with the concept of ego in the *Reconstruction*). In a way soul operates at the transcendental level as a pure spiritual entity without any relation to body. Can this contention be a subject of natural sciences will be examined in a later chapter. Interestingly enough, using the word Soul and Ego synonymously, he firmly applies the possibility of ego becoming fused with the Divine Ego. Unlike Aristotle and Neo-Platonists he emphasizes the influence of mental states on body and not that of body on mental states (see also chapter 7). This original concept of Ibn Sina receives considerable support from such areas of modern philosophy as cognitive, physiological, experiential, expressive and behavioral (James Lang Theory).³⁹ Even Iqbal's theme of ego and religious experience may have similarities with the views of Ibn-e-Sina.

Knowledge according to Ibn Sina is a kind of abstraction on the part of the cognizant. However, the abstracting power varies with cognitive abilities (this is in agreement with Piaget's learning theory). This raises the question of sense perception. Here Ibn Sina postulates 'primary' and 'secondary' perceptions, the former belonging to the state of the mind and the later being that of the external world (see also, Hume and Locke). This concept is amplified by attributing external perceptions to the five senses and internal perception to a single focal sense area (see chapter on Mystiques of Consciousness) as a seat of all senses. It integrates sense data into precepts. Fortunately, today we have much better appreciation of the functions of the Cerebral cortex of the brain and its integrative role vis-à-vis other parts of brain. The frontal lobe of the cerebrum, as we will examine in Chapter on Biophysics of Consciousness has been assigned this role and this can be easily identified with the internal seat of intellect postulated by Ibn Sina (integration, imagination, reason, estimation and memory). The theory of knowledge as proposed by him is further supplemented by a novel and original theory of human

intellect; "there is passive intellect" in man and an 'active intellect outside man, through the influence and guidance of which the former develops and matures. The "active intellect" is transcendental intellect which, when human intellect is ready, bestows knowledge upon it. This in a way is the continuation of the theory of emanation as proposed by earlier philosophers. However, taking this further, Ibn Sina, differs from earlier philosophers who proclaimed that actualized intellect is perishable. Contrary to this, in a highly scholastic manner he argues that intellect being immortal can be likened to the soul. Some caution, however, must be exercised in the interchangeable use of words like intellect, ego and soul. All have the same spiritual significance. Their immortality is necessarily contingent upon their spiritual properties unlike the body. In our opinion, if the word substance is used for soul, this substance being detachment from the Divine intellect should not be construed to have the same perishable attributes as that of the organic or inorganic materials. Elsewhere, we will again examine what meaning Iqbal attaches to the words ego and intellect in his lecture on: The Personality of the Ego and its Immortality. Suffice to conclude at this stage that Ibn Sina's doctrine of prophecy, accepting the Quranic verses as the word of God, states that "Prophet *qua* prophet is identical with the Active intellect.

Ibn-Rushd known as Avorres in the West, a scholastic of highest intellectual robustness amongst the Western Muslim philosophers lived in the twelfth century (1126-1198).⁴⁰ Defender of both religion and philosophy, he idealized the stage set by Hellenistic knowledge base which culminated in the works of Plato and Aristotle; yet, the philosophical opinions expressed by him in his book *Fasl*, the *Kashf* and *Tahafat* are a sufficient evidence of his original contributions to the advancement of Islamic Thought. We will briefly present his views on four important issues, namely, (a) "Philosophy and Religion", (b) "The Way to God", (c) "The Way to Knowledge", and (d) "The Way to Science". When European thinkers in the medieval period

began to construct their own scholastic approach to Christianity they leaned heavily towards the works of Avorres. So much so that a separate chair was created at the University of Paris for teaching "Integral Aristotelianism" developed by Ibn Rushd. In all fairness it must, however, be understood that the system of Aristotle as interpreted by Avorres within the Concept of Islamic teaching, was fundamentally different from Christian scholastic thought drawn from Aristotle.⁴¹

For Ibn Rushd, there was complete accord between philosophy and religion. He defended philosophers against the fierce attacks of theologians in his book *Fasl al-Miqal fi ma bayn al-Hikmah w-al-Shariah min al-Itisal*. In this book he maintains that philosophy, if not ordained, is recommended by religion (Shariah). Rational consideration (*Al-I'tibar*) in Shariah is different from Pure speculation or reflection (*nazar*). This be so, he proposed the theory of "double truth" which means that a "proposition can be true in philosophy and false in theology or *vice versa*. In fact, one and the same truth is understood clearly in philosophy and expressed allegorically in theology: "the only difference being that the teachings of the Quran express the truth in a manner intelligible to the ordinary man, to the unlettered, whereas the philosopher strips away the allegorical husk and attains the truth unwarnished, free from the trappings of *Vorstellung* (Coplestone, 1962).⁴² This concept is not different from the one later on developed by Hegel.⁴³ To sum up, he declares that "philosophy is the twin sister of religion, they are two friends who, by their very nature, love each other.

Being a staunch rationalist, in an epigrammatic manner he approaches the understanding by finite of the infinite through reason alone as dictated by the Sacred book which calls man in general to believe through rational proofs. Thus, according to him, neither simple oral transmission (*al-sama*) nor dialectical premises of Asharites based on "atomism" provide a sufficient basis for bringing the concept of the eternal within the fold of human intellect. The mystic way has its

own merit but this is accessible only to a limited number of believers. The proof for the eternal, the ultimate creator; according to him, can only be explored through teleological and cosmological reasoning, both starting from man and other beings not from universe as a whole. Both doctrines have been critically examined by Iqbal. His conclusion is obvious from the following quote:

"Logically speaking then, the movement from the finite to infinite as embodied in the cosmological argument is quite illegitimate; and the argument fails in toto. The teleological argument is no better".⁴⁴

Ibn Rushd discusses two issues extensively, namely, revelation, and determinism versus free will. On free will he neither agrees with the extreme position taken by Mutazilites, nor with the Asharites middle course "Man is predestined and yet he requires the power to act". This in Ibn Rushd's view is "self contradictory". The doctrine unequivocally leads to fatalism. According to him "man is predisposed neither to fatalism nor to free will". He relates determinism to "appropriate causes which may be external or internal. Our acts are accomplished both through our will and compatibility of external happenings. This, of course, is subject to universal will of God". Thus, the determined regularity in internal and external causes is what we call Predestination. Revelation, according to Ibn Rushd, is a process in which God reveals prescribed laws to persons—the Prophets, who are worthy of receiving such laws and have the ability to disseminate the same to mankind for everlasting happiness. This phenomenon is outside the ambit of putative human learning. We will return to this subject when we make a distinction between revelation and mystic experience.

On his theory of knowledge, shedding away the influence of Aristotle, Ibn Rushd attempts a clear distinction between soul and intellect. Both, as he postulates, are relevant to the progress of knowledge. In a sense by using the world knowledge he emphatically means relationship of higher existence (agent intellect, God). Here again one finds a difference between scientifically verifiable experience and

analytic experience. The later lies within the ambit of views expressed by Ghazali and Iqbal, while the former is approached by Ibn Rushd through reason corroborated with Islamic view point. For him the soul is the proximate cause of the body (matter and form); "the way of animal knowledge is by sensation and imagination, and that of man, besides these two, by intellect. Thus, the way to knowledge is either through the senses or through the intellect leading either to the knowledge of the particular and of the universal. True knowledge is that of universal and this belongs to man alone. However, this should not be confused with God's knowledge which is eternal, whereas that of man is temporal. Without going into the complicated scheme of theoretical and practical intellect, having different functions, as proposed by Avorres, we summarize here his theory of intellect in the words of Copelstone (1962);⁴⁵

"The individual passive intellect in the individual man becomes under the action of active intellect, the acquired intellect, which is absorbed by the active intellect in such a way that, although it survives bodily death, it does so as personal individual existence, but as a moment in the universal and common intelligence of the human species. There is, therefore, immortality, but there is no personal immortality"

We will return to this in Chapters 4, 5, and 6 which deal with consciousness. However, for further details, the reader is invited to refer to F. Rehman (1962)⁴⁶ on the subject of Passive and Active Intellect.

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- ¹⁷ Iqbal, M., *op. cit.*, page 143.
- ¹⁸ Iqbal, M., *op. cit.*, page 143.
- ¹⁹ Kant, I., *Critique of Pure Reason*, Translation by Kamp Smith, London, Macmillan.
- ²⁰ Iqbal, M., *op. cit.*, Page 144.
- ²¹ Iqbal, M., *op. cit.*, page 143.
- ²² Haye-Abdul, *Asharism in A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi, 1961.
- ²³ Iqbal, M., *op. cit.*, Page 4.
- ²⁴ Haye-Abdul, *op. cit.*, page 226.

²⁵ Haye-Abdul, *op. cit.*, page 226.

²⁶ Haye-Abdul, *op. cit.*, page 240.

²⁷ Shaikh, S., Al- Ghazali: Metaphysics. in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi, 1961.

²⁸ Kamali. A. S., *Ghazali's Tahaful-al-Falasifah*. English translation, *Pakistan Philosophical Congress*, Lahore, 1998.

²⁹ Durant, W., *The Story of Philosophy*, New York, Washington square press, 1961.

³⁰ Coplestone, S. J., *A History of Philosophy*, volume 2, New York, Doubleday, 1957.

³¹ Coplestone, S. J., *Ibid.*, page 40.

³² Coplestone, S. J., *Ibid.*, page 156.

³³ Iqbal, M., *op. cit.*, Page 14.

³⁴ El-Ehwany, A. F., Al-Kindi: in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi: 1961.

³⁵ Madkour, I., Al- Farbi: in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi: 1961.

³⁶ Rehman, F., Ibn- Sina: in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi, 1961.

³⁷ Rehman, F., *Ibid.*, page 480.

³⁸ Descartes, R., *The Philosophical Works of Descartes*, Translated by E. S. Hardle and G. R. T. Ross, New York, Denever, 1995.

³⁹ Lang, C. G., *Ibid.*, page 84.

⁴⁰ El- Ehwany A. F., Ibn-Rushd: in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi, 1961.

⁴¹ Coplestone, S. J., *A History of Philosophy*, volume 5, New York, Doubleday, 1957.

⁴² Coplestone, S. J., *op. cit.*, 1957.

⁴³ Durant, W., *The Story of Philosophy*, New York, Washington square press, 1961.

⁴⁴ Iqbal, M, *op. cit.*, page 23-24.

⁴⁵ Coplestone, S. J., *History of Philosophy*, volume 5, New York, Doubleday, 1957.

⁴⁶ Rehman, F., bni- Sina: in *A History of Muslim Philosophy*, Edited by M. Sharif, Royal Book Company, Karachi, 1961.

CHAPTER – II

THE WORLD OF PHYSICS

Throughout the *Reconstruction* Iqbal repeatedly draws attention to religious experience as distinct from normal experience which is verifiable through observation, experimentation and mathematical formulations; yet, an acute analysis of religious experience has been undertaken by him in his discourse on “Philosophical Test of the Revelation of Religious Experience”. In his view the cosmological, teleological and ontological arguments remain of little significance, unless it is shown that “thought and being are ultimately one”. “Experience”, according to him, “unfolding in time, presents three main levels – the level of matter, the level of life, and the level of mind and consciousness – the subject matter of physics, biology and psychology receptively.” Since these areas of science have undergone major transformation in the last four decades, it is difficult to deal with all of them in a single chapter. In this chapter we propose to discuss only the worldview of physics (the theory of matter) and leave the other subjects for discussion in subsequent chapters.

In dealing with matter, Iqbal first proceeds towards an understanding of matter in the perspective of physical phenomena known at that time. In his words, and this is true even today, “the physicist begins and ends with sensible phenomena, without which it is impossible for him to verify his theories, He may postulate imperceptible entities; but he does so because he otherwise cannot explain his sense

experience.”¹ Essentially then, the material world for a physicist is the one revealed by senses. In this context, almost passionately, Iqbal makes a distinction between sense perception and mental processes” which run through the whole gamut of experience – including both ‘religious and aesthetic’. It is, therefore, surprising to note that the physicist excludes the mental state (the sense in which metaphysics uses this), from the scope of physics for the obvious reason that physics is restricted to the study of material world, by which we mean the world of things we perceive.”² Whether sense perception and mind processes can be divested from each other remains to be examined. This we will do in a subsequent chapter in the light of Iqbal’s comments “mathematical without and physiological within”³. Here, of course, we would like to review only briefly the long standing dispute amongst philosophers on the relationship of mind and matter.

Ibn Sina, as we have noted earlier, arguing about mind-body relationship came to the conclusion that mind is a substance independent of the body. We can think away our bodies and so doubt their existence but we cannot think away our minds. Though this appeared to be a continuation of Hellenistic philosophy (Plato, Aristotle and Plotinus, among others), *albeit* with some modifications dictated by revealed knowledge, the later western philosophers, by and large, maintained the same position on the subject. For example, Descartes was father of the subjective and idealist (contrary to Bacon; of the objective and realistic) tradition in modern philosophy. Will Durant notes that primacy of consciousness was the central notion in Descartes’ philosophy. His apparently obvious proposition was that the mind knows itself more immediately and directly than it can ever know anything else; it knows the “external world” only through the world’s impress upon the mind in sensation and perception All philosophy, must in consequence, begin with individual mind in these words: “I think therefore I am” (*cogito, ergo sum*).⁴ The position taken by Descartes in ultimate

analysis basically is no different from Ibn Sina who developed the same theme in the 9th/10th century. Spinoza, the greatest of modern philosophers (1632 – 1677) was of Spanish/Jewish descent. He was excommunicated for his alleged heretic utterances against the Jewish faith. Not concerned with this aspect of his life, we find in his metaphysical approach the ideas which had deep resemblance with the philosophies of Ibn Rushd and Ibn Sina in as much as his theories of emanation, intellect and knowledge are concerned. Like Ibn Rushd, for example, he opined that the text of Bible is not to be taken literally but allegorically. This be so, what attracted his attention most was the theory of “homogenous substance” put up by Descartes. This may be stated as follows:⁵

Given an initial push by God” said Descartes, “and the rest of astronomic, geologic and all non-mental processes and developments can be explained from a homogenous substance existing at first in a disintegrated form; and every movement of every animal, and even of the human body, is a mechanical movement” “all the world, and every body, is a machine; but outside the world is God, and within the body is the spiritual soul.

Spinoza in his treatise on Nature and God seems to be fully imbued with the concept of homogeneous substance. The word substance used by him does not mean the constituent material of anything, but refers to the eternal order. In other words it may constitute the essence of the world and thus Spinoza identifies substance with Nature and God. Interestingly enough, as he proceeds further in other treatises as ethics, religion and immortality, or intelligence and morals, he uses a similar jargon for substance as was employed by Ibn Sina and Ibn Rushd. His “nature begetting” is *élan vital* which identifies the substance with essence, and thus with creative and not with passive or material nature. For him “the universal laws of nature as the chain of natural events are the same as decrees of God”. The mechanism which Descartes saw in matter and body alone, Spinoza sees in God and mind as well. The “mind of God” as Spinoza conceives, is sum of all mentality spread over space and time,

the diffused consciousness that animates the world. This is how his concept of homogeneous substance permeates the world (universe).⁶

Following a brief review of the works of some philosophers on the relationship between mind and matter, it seems appropriate to discuss briefly as to what tilted the philosophical thought towards the ascendance of materialism. The story started with Francis Bacon,⁷ his theory of knowledge with a focus on the study of the nature of materials through observation, experimentation and verification. This was further fortified by British philosophers mainly Locke⁸ and Hume,⁹ giving birth to what is known as Positivist Philosophy displacing metaphysics into the backyard of knowledge yielding experience. In fact, as Will Durrant remarks:¹⁰ "Baconian tradition had turned thought in the direction of things, mind in the direction of matter and catalyzed the materialism of Hobbes, the sensationalism of Locke, the skepticism of Hume, and the utilitarianism of Bentham; so many variations on the theme of a practical and busy life." The very nature of epistemic schema now relied upon empiricism, scientific theory and proof. Subsequently, however, greatest blow to metaphysics was inflicted by Kantian Philosophy which dampened the quest for discovering the ultimate nature of reality. As Will Durrant¹¹ puts it: "the metaphysical extravaganza of Fichte, Hegel and Schelling, with their varying readings of the ancient riddle, the positivist philosophy, however, reached its culmination in Herbert Spencer", another British philosopher, who swam in the positivist stream set in motion by Comte, and Darwin. For sake of brevity we have to restrict ourselves only to the remark that Spencer's synthetic philosophy epitomized through the 'first principle',¹² "encompassing Biology, the Evolution of life, Psychology; the Evolution of Mind and Society", not only brought him fame but also promoted the advancement of positivist philosophy. All in all, he was the expansionist of industrialization with the outlook of a "mechaniciation" and engineer. On this count, Will Durrant

presents us with an extremely illuminating summary of the development of human thought, past the mid nineteenth century which we are tempted to reproduce in the following paragraph and then move on to the revolt against materialism:¹³

The history of modern philosophy might be written in terms of the warfare of physics and psychology. Thought may begin with its object, and at last, in consistency try to bring its own mystic reality within the circle of material phenomena and mechanical laws; or may begin with itself, and be driven by apparent necessities of logic; conceive all things as forms and creatures of mind. The priority of mathematics and mechanics in the development of modern sciences, and the reciprocal stimulation of industry and physics under the common pressure of expanding needs, gave to speculation a materialistic impulsion and the most successful of sciences became the models of philosophy. Despite Descartes insistence that philosophy should begin with the self and travel outwards; the industrialization of western Europe drove thought away from thought and in the direction of material things.

Let us now turn to our philosopher and find out how he perceives the genesis of mind and matter. He is not satisfied with the ontological argument of Descartes on the ground that conception of existence is no proof of objective existence. There is a gulf between the 'ideal' and real. The ideal is, for example, in one's concept or in one's thought and one uses this to bridge the gap between the two (ideal and real). At least, the way we bridge the gap through thought gives us an unrealistic mechanism but in reality fails to bridge the gap between ideal and the real. This is possible only when, as Iqbal writes: "thought or idea is not alien to the original nature of things; it is their ultimate ground and constitutes the very essence of their being, infusing itself in them from the very beginning of their careers and inspiring their onward march to self determined end." Yet, he thinks that "our present situation necessitates the dualism of thought and being. Every act of the human knowledge bifurcates what might on proper enquiry turn out to be a unity into self that knows and confronting 'other' that is known." This is possible only when thought and being are ultimately considered as one. In such a situation the only

solution lies in properly interpreting the religious experience and giving it a status it deserves in the realm of total experience. (normal as well as analytic). This is an enormous task if one has to find physical, biological and psychological bases for the same. Iqbal attempted to do so drawing evidences from metaphysical, scientific and mystic sources. With the advancement of scientific knowledge, it is now possible to extend these evidences irrespective of the materialistic stance of physicist. We must, therefore, locate the meeting point of science and philosophy.

Now in our effort to explore the world of physics, let us start from the following quotation of Iqbal:¹⁴

Nature is not what we know her to be; our perceptions are illusions and cannot be regarded as genuine disclosures of Nature, which according to the theory (materialism), is bifurcated into mental expressions, on the one hand, and the unverifiable, imperceptible entities producing these impressions, on the other hand. If physics constitutes a real and genuine knowledge of perceptively known objects, the traditional theory of matter must be rejected for the obvious reason that it reduces the evidence of our senses, in which alone the physicist, as observer and experimenter, must rely, to the mere impressions of the observer's mind. Between Nature and the observer of Nature, the theory creates a gulf which he is compelled to bridge by resorting to the doubtful hypothesis of an imperceptible something, occupying an absolute space like a thing in a receptacle and causing our sensation by some kind of impact. In the words of Professor Whitehead: "the theory reduces one half of Nature to a dream and the other half to a conjecture." Thus, physics finding it necessary to criticize its own findings has eventually found reason to break its own idol, and the empirical attitude which appeared to necessitate scientific materialism has finally ended in revolt against matter, since objects are not objective states caused by something called matter, they are genuine phenomena which constitute the very substance of nature and we know as they are in Nature." Further, "the concept of matter has received the greatest blow from the hands of Einstein – another eminent physicists whose

discoveries (relativity theory) have laid the foundation of a far reaching revolution in the entire domain of human thought.

The paragraph quoted above, has several ramifications, yet, it clearly explains the position taken by Iqbal with regard to 'mind' and 'material'. **First**, he quotes philosopher Berkley who refuted the theory of matter as unknown cause of our sensations. **Second**, he observes that our perceptions are only illusions. **Third**, acceptance of the theory of matter, as envisaged by the physicists, who as observers and experimenters rely only on the impressions of the observer's mind. Physics, as he examines in his own times, with the advent of the theory of relativity, has risen in revolt against the empirical attitude which has its moorings in scientific materialism. **Fourth**, he finds support in the observation of Russell: the theory of relativity has damaged the traditional notion of substance more than all the arguments of the philosophers. Matter for commonsense is something which persisted in time and moves in space, but for modern relativity physics, this view is no longer tenable. From this point onwards we are now in a position to discuss the worldview of physics in light of the classical and modern laws of physics.

Leaving behind metaphysics for a while, we would like to proceed with the laws of physics and mathematics as we understand them today. To begin with, it will be of advantage if we deal in tandem with two eras of physics, namely, the classical and the modern. This will give us a more vivid appreciation of these laws as they impacted the theories of time and space, repeatedly referred to by Iqbal in several of his discourses. Classical physics started its journey with Copernicus and Galileo who shattered the myth created by Aristotle that matter at rest has a preferred position; the earth is, therefore, stationary and that, the sun, the moon, the planets and stars moved around the earth in circular orbits. This also meant that earth was the centre of the universe. Copernicus was the first to propose in 1514 that sun was stationary at the center and that earth and the planets orbited

around the sun. However, some 100 years later Johannes Kepler (a German), and Galileo (an Italian) rediscovered the Copernicus theory and inflicted a death blow to the Aristotelian/ Ptolemaic theory by confirming that earth orbited around the sun not in a circle but in an ellipse. However, they could not argue about the forces which caused the orbital motion of the earth. It was left to epoch making discovery of Isaac Newton published in principles of Mathematics, considered by Stephen Hawking—“the most important simple work ever published in physical sciences”.

Newton's laws of motion¹⁵ and gravitation,¹⁶ as they are known today, unveiled the mystery of the movement of bodies in space and time.

It follows from Newton's laws that (a) there is no unique standard of rest - for example, if it is assumed that the earth is neither rotating on its axis nor orbiting around the sun, one could say that earth was at rest and that a train was moving north at a speed of 70 miles per hour. Conversely, one could say that train was at rest and the earth was moving south at seventy miles per hour, (b) the laws are equally applicable to moving bodies in a train traveling at a certain speed, and (c) the lack of absolute standard defies that two events taking place in different times will occur in the same position. Thus, it was concluded that there is lack of absolute position or absolute space. This worried Newton (being a man of faith) because it was not in agreement with the concept of absolute God. For this reason, he was inclined to agree with Bishop Berkeley who believed that all material objects, space and time are illusions.

Newton believed in absolute time, since he thought that, using a good clock, one could exactly measure the interval of time between two events, irrespective of the person who measured it. It was postulated that time was completely separate from and independent of space. This remained a commonsense view for a long time. The laws were mathematically correct and were applicable with extraordinary precision to large bodies, including the earth, the planets and

the stars. Then came a major upheaval, what Iqbal calls the revolt of physics against its own foundations. Indeed, this was not a revolt by any standard. It was simply an extension of the knowledge existing at that time. This is how science continues its onward march. In this regard it was the exciting theory of Relativity, proposed by Einstein, which caused a quantum leap in our understanding of the relationship between time and space.

To be able to have a further comprehension of the time-space framework, it is essential that we begin with the theory of propagation of light. It is now known that light travels at a finite but definite speed. The earlier estimates were placed at 140,000 miles per second. This has now been revised to 186,000 miles per second. The basic unit of light is photon. The photons are produced when electrons collide, be it in the glowing of an electric bulb, or as is continuously happening on the surface of the sun by the collision of electrons (Hydrogen to Helium). A photon is a mass-less particle and it behaves both as a particle and a wave. Interestingly enough, when Maxwell opined how moving magnets create electric currents, while moving charges create magnetic field, it was calculated that electromagnetic ripples (waves) travel with the same speed as the light waves (i.e. 186,000 miles/second). It was also concluded that light is a form of electromagnetic wave. In principle, it was argued that all waves (e.g. radio waves) must travel at the same speed. However, different waves differ from each other only in wave length which is the distance between the two successive crests (Fig.2.1).

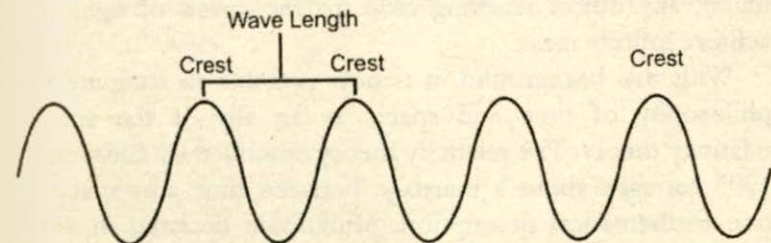


Figure 2.1- Waves: note the wave length

In radio waves this distance is of the order of one meter. It is only a few centimeters in short waves or microwaves. Those with a distance of 10^{-4} centimeter (10 thousandth of a meter) are infra-red waves. The visible light has a wavelength of 40-80 millionth of a centimeter. Even shorter wavelengths, for example, those of X-Rays are known. All these waves are part of light and constitute what is known as a spectrum.

For a long time it was thought that light travels through the medium of ether as do the radio-waves through the medium of air. This was conclusively proven wrong in 1887 by two American physicists Michaelson and Morley who showed that there was no difference in the speed of light whether it was measured along the movement of earth or at right angles to this. This finding prompted Einstein in 1905 to postulate that whole idea of ether is unnecessary if one is willing to abandon the idea of absolute time. Acceptance of the very fact that light travels at finite speed (186,000 miles/second) gave rise to the fundamental postulate of Einstein's special theory of relativity, that is, all observers, whatever their position and speed of movement should measure the same speed of light. As a consequence of this, Einstein worked his famous equation of equivalence of energy and Mass, namely $E=mc^2$, where E =Energy; m =mass and C =velocity of light. This equation tells us that energy which an object attains due to its motion will add to its mass and thus will make it harder to increase its speed. This simply means that nothing may travel faster than the speed of light. (remember light is composed of photons which have no mass), any object reaching close to the speed of light will achieve infinite mass.

With this background, it is now possible to examine the philosophy of time and space, as an ally of the special relativity theory. The relativity theory described by Einstein in 1905 brought about a marriage between time and space in one mathematical description. Minkowski declared in 1907 that this amounted to treating time as fourth dimension of space almost at right angles to each other. In his words, "The

views of space and time have sprung from the soil of experimental physicists and therein lies their strength henceforth, space by itself and time by itself are doomed to fade away in mere shadows. How time becomes a fourth dimension is shown in Fig. 2.2 & 2.3? (also read explanatory note with the diagram.

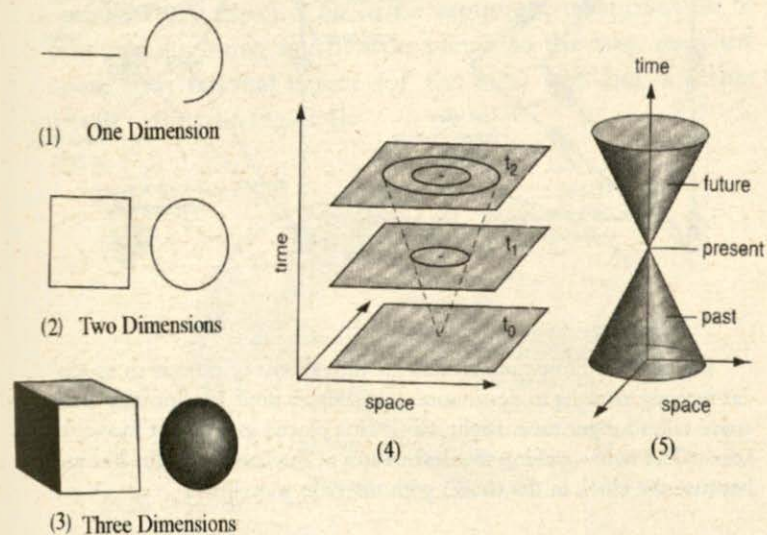


Figure 2.2:* The images 1,2 and 3 are of one dimension, two dimension, and three dimension Volumes. The image 4 introduces the time dimension by indicating motion or movement of a series of stacked surfaces indicating a spread event over time. Image 5 shows the light cone model of events and times.

* Note: Figs. 2.2 and 2.3 are adapted from PICO, R.U., *Consciousness in Four Dimensions*, McGraw Hill, New York, 2001.

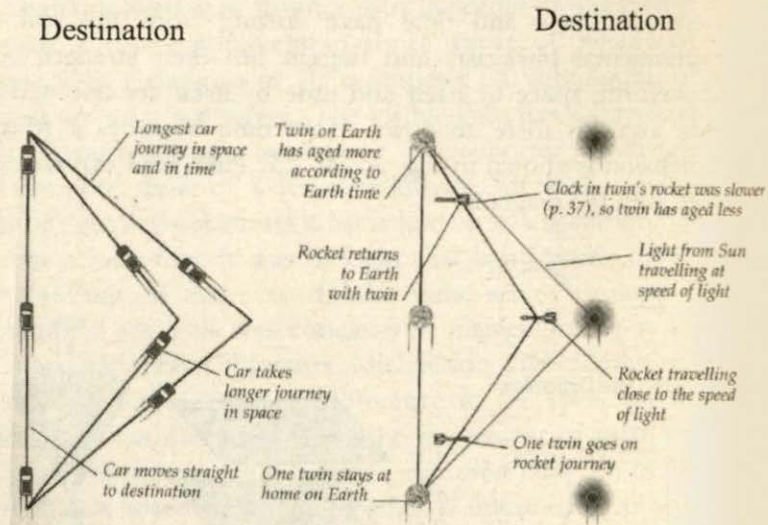


Figure 2.3: How time affects the movement of objects in space? Left: car moving straight to destination takes lesser time. Car moving straight in space takes longer time. Right: two twins placed in a rocket move through space. The twin reaching the destination at the speed of light has aged less because the clock in the rocket with the twin was slower.

The special theory of relativity had successfully explained that (a) the speed of light appears the same to all observers and (b) that nothing can travel faster than the speed of light. This, however, was inconsistent with the Newtonian theory of gravity, according to which objects attracted each other with a force directly proportional to the distance between them. This simply implied that if an object is moved, the force on the other would change and the gravitational effect should travel with infinite velocity – not necessarily at or below the speed of light as dictated by the special theory of relativity. This worried Einstein. But the dilemma was resolved when he proposed another theory in 1914 which is now known as ‘general theory of relativity.’ This theory postulated that (a) space-time framework, as has been previously assumed was not flat but curved and that this

feature results from the distribution of mass and energy in it, (b) bodies like earth are not made to move on curved orbits by a force called gravity, instead they follow the nearest thing to a straight path in curved space which is called “geodesic” (a geodesic is the shortest line between two points in a circle). How time becomes fourth dimension and how space-time are conceived as curved are shown in Figure 2.2; (see also explanatory note). The same argument is applicable to mercury, which being the nearest planet to the sun, feels the strongest gravitational effect (of the sun) and has a rather elongated orbit (see Fig. 2.4).

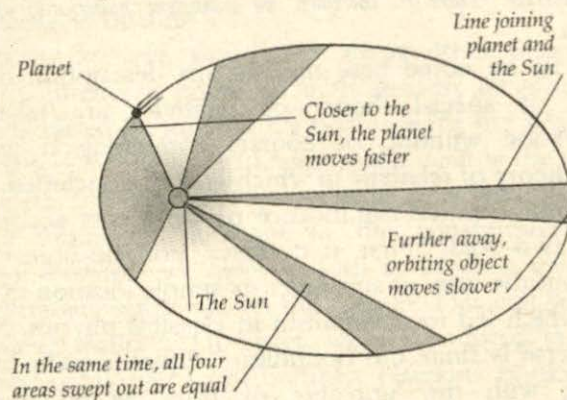


Figure 2.4

The general theory makes another prediction that time should appear to run slowly near a massive body like earth. This prediction was proven using a pair of very sensitive clocks, one placed down below the surface of the earth and the other far above the surface. The one deeper in the earth was found to run slower since the gravitational force becomes weaker as it moves away from the earth). From the point of view of our focus on the philosophy of time and space, what can be concluded from the foregoing discussion can best be summed up in the words of Stephan Hawkins.¹⁷

Newton's laws of motion put an end to absolute position in space. The theory of relativity got rid of absolute time In the theory of relativity there is no unique absolute time, but instead each individual has its own personal measure of time that depends on where he is and how he is moving.

So far, we have presented faithfully, though briefly, the view point of physicists in respect of time-space frame of reference. Let us now find out how Iqbal perceived space-time in the light of Newton's laws of motion and gravitation and Einstein's theory of relativity. The following quotation from the *Reconstruction* may be of help in appreciating the understanding of Iqbal.¹⁸

With Einstein space is real, but relative to the observer. He rejects the Newtonian concept of an absolute space (?). The object observed is variable; it is relative to the observers, its mass, shape, and size change as the observer's position and speed change, movement and rest too are relative to the observer. There is, therefore, no subsistent materiality of classical physics.

It must be noted here that in this description only the features of special theory of relativity are taken into consideration without, of course, combining it with the general theory of relativity in which gravity is included.

The philosophical significance of the theory according to Iqbal is two-fold: "First, it destroys, not the objectivity of nature, but the view of substance as simple location in space—a view which led to materialism in classical physics. Second, the universe is finite but boundless." Iqbal is really worried, however, with the 'unreality of time' as an important component of relativity; regarding the future as something fixed and the "time as a free creative moment having no meaning. This criticism of Iqbal, needs to be further substantiated, or even ignored when special theory of relativity and general theory of relativity are taken together. This we will discuss in the later sections when we explore the physicalists world view of matter as it emerged with the rise of modern physics (Quantum Mechanics). Suffice to say at this stage that the relativity theory destroying the classical concept of physicists materialism, does not in any way stand in the way of Iqbal's own theme of religious experience as a distinct category different from normal experience (observation, experimentation, verification, inference). Further, if properly interpreted, Bergson's "serial time", as

also that of Iqbal, embodied in the physicists term: time's arrow - from the past to the present and to the future, in a non-deterministic mode having creative moments can be reconciled. Interestingly enough, one comment which Iqbal quoted himself from a great Muslim saint remains uninterpreted. This relates to 'Divine time' and 'Divine space'. This we will take up when we discuss the genesis of inner religious experience. In the meanwhile we cannot escape our skepticism about Iqbal's reliance on Oupenky's argument that fourth dimension is simply the "movement of the three dimensional figures and fourth dimension of space really ceases to be time".¹⁹

This be so, yet, along with many other philosophical issues we intend to come up with answers to some of the questions raised by Iqbal in his first essay of the *Reconstruction* (Knowledge and Religions Experience): what is the character and general structure of the universe in which we live? Is there a permanent element in the constitution of this universe? For this we have to turn to modern physics and then formulate our views on the subject. This will be done in subsequent sections. However, we are tempted to cite the following paragraph from Stephen Hawkins book: *A Brief History of Time*.²⁰

The situation, however, is quite different in the general theory of relativity. Space and time are now dynamic quantities space and time not only affect but also are affected by every thing that happens in the universe. in general relativity it becomes meaningless to talk about space and time outside the limits of universe The old idea of an essentially unchanging world was replaced by the notion of a dynamic, expanding universe that seemed to have begun a finite time ago, and that might end at finite time in the future.

In the backdrop of this statement just contemplate on the Qur'anic verses quoted by Iqbal: "He (God) adds to His creation what He wills and "The universe is so constituted that it is capable of extension" (35:1)²¹. This has been experimentally proven (Hubble, 1926)²². Notwithstanding these facts we now take up advances in modern physics as an extension of classical physics. The issues which are germane

to our understanding of experience (both normal and analytical) will receive our high attention, since the problem we are attempting to tackle is the one of finding a physical and biological (including psychological) basis for inner religious experience—the central theme of Iqbal's "Reconstruction. One problem stands out as we compare the classical physics with modern physics. Classical Physics, which includes the works of Copernicus, Galileo, Newton, Michelson and Morley, and even the special theory of Einstein, among others, has clear mathematical basis. Yet taken together all classic laws are deterministic as applied to large bodies. The same laws do not hold in case of small particles. On the other hand, modern physics, which takes its life from quantum mechanics also remains deterministic so long as we deal with small scale behaviour. However, indeterminacy creeps in at quantum level when we magnify an event from quantum level to classical level (Penrose 1989).²³

Talking about size and time duration, let us find out the ranges we are dealing with. The age of the universe, for example, is 10^{18} years and the life of the shortest lived particle is 10^{-23} seconds. The human life time on the average is 70 years. The size on the other hand, varies from 10^{-15} of a meter for a smallest short-lived particle to 10^{27} meters for the radius of observable universe at the present time. Besides, the smallest unit of time is Planck's unit, the chronon, and the smallest unit of Planck's length is 10^{-43} meter. Planck's unit describes the lowest limits of size and time to which a man can extend his thought (in practice none of these limits are achievable), same may be true of the immensity of time and size. We will return to this when we discuss Divine time and Divine space (And verily unto thy Lord is the limit; (Al-Qur'an, 53:42)²⁴. It is on account of these variations that Penrose *op. cit.* makes the following remarks:

The concept of Planck's time and Planck's length fall out naturally when one tries to combine the physical theories which describe the large and small, that is, combining Einstein's general relativity, which describes the physics

of very large, with quantum mechanics which describes the physics of the very small.

Implicit in this quotation is the realization that the physicists have yet to find a unified theory which is equally applicable to all states of matter in all situations.

With this background, we are now in a position to take up Iqbal's enquiry as to what is the nature of this universe? A question which he raised in his discourse on "Knowledge and Religious Experience". To be able to do so, we have to have some knowledge about (a) the nature of matter as we understand it today and (b) what quantum mechanics is about? The theory of matter has undergone dramatic changes over the years especially through the laborious studies and consequent discoveries in the field of particle physics. At the time when Iqbal wrote the *Reconstruction*, the ultimate units of which matter was thought to be composed of, comprised negatively charged electrons, the positively charged protons and those with no charge, the neutrons. The later two constituted the nucleus of the atom, and the former were shown to orbit around the positively charged nucleus. Since then, however, a whole array of elementary particles has been described. A total of 61 such particles have been identified. However, for our purpose we will concentrate only on four such particles, namely, the electrons, the photons, the quarks and the gluons. In quantum electrodynamics, the theory of electrons and photons, it has been observed that electron is a "fermions" (that is, it obeys the Pauli's exclusion principle). It has a unit electric charge (labelled negative). The photon is a boson (that is, it obeys the anti exclusion principle, and it is electrically neutral). In quantum electrodynamics the electromagnetic force between two electrons (though negatively charged) comes about through the emission of photons by one electron and its absorption by the other. This is known as "virtual exchange" of photons between electrons? Such a process is continuously in progress on the surface of the sun at a very high temperature where hydrogen is converted into helium. The sunlight that is showered on

the surface of the earth comprises of nothing else but photons. Further, as a rule of thumb it may be conceived that every particle has an antiparticle. For an electron, it is a positron. Electrically neutral photons are their own antiparticles. Same is true of quarks. This is how the Qur'an describes it: "Glory be to him Who created all the sexual pairs of that which the earth growth, and of themselves, and of that which they know not": (Al-Qur'an, 36:36).

For a long time it was thought that electrons, protons and neutrons are the only fundamental particles of which the atoms are made of. This is true for electrons but turned out to be wrong for neutrons and protons. It has now been postulated by Gel-Mann²⁵ that neutrons and protons are made of quarks, which are indeed, the most elementary particles. Two types of quarks have been identified. The 'u' quark with a charge of $+2/3$ and "d" quark with a charge of $-1/3$. A proton is made of two "u" type quarks and one 'd' type quark. The charge on the proton would thus be 1^+ (i.e. $+2/3^+ + 2/3^+ - 1/3^- = 1^+$). Similarly, a neutron is made up of two 'd' quarks and one 'u' quark. The net charge on neutron accordingly will be zero ($1/3^- + 1/3^- + 2/3^+ = 0$). The quarks are confined within the limits of protons and neutrons and are bound together by a force that comes from the exchange of quanta called gluons. (the principle works in the same way as witnessed in the 'virtual' exchange of photons between electrons). Gluons were postulated on theoretical grounds. However, their presence has been recently confirmed through the works of two American Physicists who have been awarded Nobel Prize in Physics for the year 2004. So much for the composition of matter, we can now conveniently understand that all objects whether living or non-living, irrespective of size, colour, shape or even "essence" are made up of sub-atomic particles. The hierarchy proceeds in the following manner: object – molecules – atoms, electrons – protons and neutrons (which makeup the nucleus). The last named being made up of two types of quarks, namely: 'u' and 'd' held together by gluons. This be so, there is one dilemma

which remains to be resolved as yet. The same is summed up by Stephen Hawkins in the following words:²⁶

Einstein's general theory seems to govern large scale structures of the universe. It is what is called a classical theory; that is, it does not take account of the Uncertainty principle of quantum mechanics, as it should for consistency with other theories.

In order to appreciate the nature of this dilemma, let us examine some studies which gave fillip to quantum physics. Max Planck (1858–1947), who received Nobel Prize in 1918, discovered that from the perspective of classical physics, the Physics of Isaac Newton, it was not possible to predict accurately the trajectory of an electron. Nor could it be explained on the basis of Maxwell's electromagnetic wave theory. In 1900 Max Planck suggested that energy is radiated and absorbed in discrete packets, called 'quanta' rather than in a continuous wave. Each quantum is associated with radiation of a single frequency. Mathematically it was expressed that energy was proportional to frequency times a constant. It was also concluded by him that packets of tiny bundles of energy are integral part of all electromagnetic radiation and that they could not be sub-divided. These indivisible tiny bundles of energy were named Photons which traveled at speed C , the velocity of the light. To sum up the Quantum Concept we can say: (a) that different quanta are released in different regions of the electromagnetic spectrum and (b) that the same principle is applicable to the release of quanta from an electron in a falling energy state, that is, the collapse of wavefunction. These concepts will be taken up again when we will discuss consciousness in Chapter - 5. It is now known that electron cannot be considered as occupying a predictable position as Schrodinger showed for the single electron orbiting a single Proton in the hydrogen atom through his famous mathematical equation. Contrary to this, on the basis of the data obtained from spectral studies it was argued that it was electron cloud that forms a pattern in space indicating the probability of finding electron at various points in the vicinity of Protonic nucleus. This surprised Schrodinger and

made him remark that there was something psychological about the electron. Even the Great Albert Einstein was unable to agree. In November 1926 Einstein wrote - "The theory says a lot, but does not bring us closer to the secret of the "Old One." I, at any rate, am convinced that He is not playing at dice."

It is interesting to note that both Schrodinger and Einstein were displeased with the quantum theory. In their opinion the theory provided only an unfinished and incomplete description of nature. It is obvious even today that with Schrodinger's equation one can make verifiable predictions about the movement of electron in an hydrogen atom. Yet, it falls apart when we take into consideration the collapse of wavefunction as predicted by Heisenberg's uncertainty principle (collapse of wavefunction). Unfortunately, there is no theory as yet to explain this phenomenon. Some mathematicians (de Beroglie, 1960)²⁷ have suggested that since Hiesenberg's uncertainty principle (collapse of wavefunction) arises from the linearity of Schrodinger's equation, there might be as yet an undiscovered nonlinear version of Shrodinger's equation: "which may evade the problem related with the collapse of wavefunction". Such a non-linearity has recently been reported (Bollinger et al 1989; Wineberg, 1989).²⁸ This assumes high significance in the realm of consciousness. We will have a full discussion on this aspect in the Chapter on Biophysics of Consciousness not withstanding the view that a large number of biophysicists may continue to use quantum theory in the standard linear version as was developed to explain the facts of atomic physics. In brief all this means that (a) the classical laws of physics are deterministic, while the principles enunciated by quantum physics as applied to sub-atomic particles are probabilistic and thus non-deterministic. Philosophically, it lends significant meaning to the Concept of Free-will, (b) there is no absolute space, nor is there any absolute time, (c) that the laws of physics are not equally applicable to all freely

moving bodies (large and small) and (d) that time should appear to run slowly near the massive body like the earth.

The discrepancies noted in the application of Newton's laws of gravitation and the relativity theory on the one hand and the principles enunciated by quantum physics for sub-atomic particles on the other hand (i.e. quantum electrodynamics and quantum chemodynamics) have remained a source of worry for the physicists. As a general principle, the same theoretical framework should be able to explain away the physics of all moving bodies, large or small. To overcome this difficulty efforts have been made to combine various theories into one so called the unified theory. It is in the same vein that Gell-Mann²⁹ makes a very pointed reference to quantum mechanics in the following words:

The discovery of quantum mechanics is one of the greatest achievements of the human race, but it is also one of the most difficult for the human mind to grasp. It violates our intuition or rather our intuition has been built up in a way that ignored quantum mechanical behaviour.

Avoiding any excessive details we will examine the basic elements of only a few well known unified theories, namely, the Standard Model, the Grand Unification Theory and the Superstring Theory. Within the ambit of the Standard Model are included basically all the known particles (excluding the gravitanon).. The theory seems to be in excellent agreement with observations, despite the fact that a few features of this model have yet to be confirmed by experiment. One major difficulty with this model lies in the inclusion of a dozen of arbitrary constants describing particle - particle interactions. Such a theory, it has been argued, cannot be regarded as fundamental (Gell-Man, 1994).³⁰ Regarding the Grand Unification Theory, an advancement was made over the Standard Model when it was postulated that unification of interaction required by the Standard Model are in fact seen to be unified, along with new ones, at very high energies; the same appearing to be separate at lower energies of today's

experiments. Again a number of other caveats, dictated that it could not be ranked as a fundamental theory. As a passing remark it must be added that Einstein himself dreamt of a field theory which would unify in a natural way his general theory with Maxwell's Electromagnetic Theory. However, for this purpose, the mathematical equations he wrote in his old age did not describe plausible physical interaction of gravitation and electromagnetism (we may recall that Einstein did not favour quantum physics): The following quotation from Gell-Maun may be brought to the attention of the reader:³¹

Still, we theoretical physicists have been inspired by Einstein's dream, of a formal quantum field theory embracing not only the photon, the gravitation, and all other fundamental bosons (like photons), with their associated electromagnetic, gravitational, and other fields but also the electrons.

Such a dream is now being realized through postulating what is known as "Superstring Theory". The theory in essence conceives that a set of elementary particles could be treated as if composed in a self consistent manner as a combination of those same particles. All the particles would serve as quanta for force fields binding the constituents together, and all the particles would appear as bound states of the constituents. We owe this theory to the works of J. Schwartz, and Neveu 1971³². Their work, however, culminated in "heterotic superstring theory", presented later on by Princeton University Physicists. The beauty of the theory lies in the fact that it includes gravitation as well.

In order to understand the nature of the universe in the light of classical laws of physics, and modern physics (Quantum mechanics), we have described the theory of matter down to the elementary particles, along with a number of associated concepts; yet, a number of questions remain unsettled which must be attended to for a fuller comprehension of the nature of the universe. These include: (a) Is the universe finite and static? (b) What is the origin and fate of universe? (c) Is there a single force through which all

laws of physics regulate the physical, biological and psychological phenomena? We will take the last named first, and then turn our attention to the other two issues.

We have already implicitly made reference to electrical and magnetic forces.** The two forces were combined into a single electromagnetic force by Maxwell. Here was the beginning of the unification of forces. This was, however, not enough for the reason that a number of other forces such as weak and strong nuclear forces as well as gravitational forces have since been under the scrutiny of physicists. Not surprisingly, through the works of theoretical as well as experimental physicists, it has constantly been emphasized that the laws of physics, whether originating from classical, Neo-Classical or Quantum Theories should be equally applicable to all levels of physics (the large or the small. Accordingly, attempts are underway to bring about a marriage between classical and quantum physics which, however, have remained elusive so far. Nevertheless, considerable advances have been made in the last two decades to solve this problem through what is known as a unified theory of energy, which could uniformly explain the behavior of all types of particles. As a next step in this direction, some hundred years later, when electrical and magnetic forces were combined, Abdus Salam and Wienberge in 1967 proposed theories postulating the unification of the weak force with the electromagnetic force. In addition to photons, they proposed the presence of a set of three bosons which carried the weak force. The presence of weak force has been used to show how electron turns into an electron neutrino and electron—neutrino into electron through the intermediacy of quarks (Neutrinos are produced in the center of the sun and are showered continuously on earth). They are neutral in charge and can pass through³³ the earth; electron-neutrino has no charge). Abdus Salam received the Nobel Prize in 1979. Once in our meeting with him, before he received Nobel Prize, we asked him why was he so excited about the weak force? He promptly replied, "there is one God, one force and there

cannot be multiple forces operating independently. I am convinced that my combining of weak force with electromagnetic force will ultimately lead to unification of all forces. Presently, the unified theory of energy seems to be taking the same path.

It has, for example, now been predicted that at "high energies the strong force becomes much weaker and the quarks and gluons behave almost like free particles which can then be detected. (Normally quarks are bound together firmly in protons and neutrons, and thus it is not possible to detect them). Proof for the last of the forces, that is, the strong nuclear force, mediated by gluons, as already stated has now been provided by two American physicists who have received Nobel Prize in Physics for the year 2004. In spite of these advancements, and may more that fall beyond the scope of this book, we are yet far away from finding a Grand Unification Theory applicable with equal precision to the large and the small. Iqbal's vision of reductionism may have to wait for some more time to unveil the mysteries underscored by the revealed knowledge for the complete satisfaction of the concrete mind. Even then sufficient material is now available to place Iqbal's thoughts on a firm footing.

Whether this universe is finite and static is to be considered in alliance with the theory of space and time as discussed earlier. It is now an established fact that space and time are dynamic quantities. This understanding of space and time has revolutionized our views about the universe. Accordingly, the long held notion about the unchanging universe that could have existed, and could continue to exist forever, was replaced by the view that the universe is dynamic, and is in a constant flux of expansion. Concrete evidence for this came up only in 1926 when Edwin Hubble demonstrated that beyond our galaxy there exists a large number of other galaxies; all separated from each other by vast tracts of empty spaces. He was also able to work out the distance from earth of a number of galaxies, using the

luminosity of stars as a measure of distance. We now know that our galaxy is only one of some hundred thousand million galaxies which can be seen by using modern telescopes. Further, each galaxy contains some hundred thousand million stars. To have some idea of distance, the unit of measure used now is the time taken by light to cover a distance of one meter. Thus, the meter is defined to be the distance traveled by light in 0.0000000333640952 seconds using the cesium clock. Employing this measure we can speak of the distance in light seconds (distance which light travels in one second) or even in light years (distance which light travels in one year). Considering the immensity of the universe, the diameter of which is stated to be of the order of 10^{27} meters (10^{24} kilometers), the human mind can describe the distance between farthest stars and earth only in terms of manageable figures of light year. So far away are some stars from the earth that radiated light from them has yet to reach the earth. In contrast, consider the distance of the earth from the sun which is only 8 light seconds away. As the human mind works toward its limits and then is lost in infinity, it is only reasonable to argue that the serial time with its past, present and future is a mere illusion of human mind having very insignificant relationship with what Iqbal quotes from a Sufi saint as "Divine Time". We have more to say about this in subsequent chapters. Further, that the universe is expanding fast has been confirmed through the painstaking studies of Hubble. He noted that the spectrum of light ranges from violet to red, that is from high frequency waves towards low frequency waves. The red part of spectrum shifts from star to star depending on their distance from earth. The farther the star, the greater the red shift, the shift has been measured for some stars. Obviously, then, it is not wrong to conclude that all galaxies are moving away from us. In 1929, he further postulated that the size of a galaxy's red shift is not random, but is directly proportional to the galaxy's distance from us or in other words the farther the galaxy is, the faster it is moving away from us. This simply means that the universe is not

static and the distance between galaxies is growing all the time. This now takes us to the question: whether such a massive universe had a beginning and that whether it will have an end. To date, the arguments built up by physicists are substantially indicative of a big bang theory of the origin of universe. One model which describes the big bang theory suggests that some times in the past the distance between neighboring galaxies must have been zero. At that time it can be assumed that the density of the universe and the curvature of the space time were infinite. If this be so, and since mathematics cannot handle infinite numbers, the general theory of relativity falls apart. What can be assumed then is that space and time before the big bang were flat. The conclusions which can be drawn from these assumptions are: (a) that we have no idea as to what happened before the big bang and the events happening at that time are not properly understood, (b) that serial time had a beginning at the big bang, and (c) that we cannot determine precisely in quantum and mathematical terms the event of big bang known as a "singularity". It appears to us that the failure of mathematicians and physicists to grasp and understand the pre big bang state of some kind of universe, if any, does not belittle the success of the Creator in paving the way for the big bang (or any similar phenomena) for the onset of the universe. It should be noted with the deep interest that mathematics as such is not a product of human mind, it was certainly conceived prior to coming into existence of physical objects (large and small) and thus not only it pre-existed but, in fact, preceded the physical objects. Man has only discovered the mathematical laws. No wonder then that we are on our way to discovering a new physics as emphasized by Penrose in his highly exciting book: "The Large, the Small and Human Mind" in the following words:³⁴

There is indeed something profoundly new to be learned about the physics of our universe at the boundary between the physics of the small and the physics of large I maintain that the missing physics must have a

character very different from that we have become accustomed to in the physics that we now know.

This description of the universe, coming into existence as a result of big bang, only partially answer the question raised by Iqbal as to what is the nature of the universe in which we live? We have much more to say about this in subsequent chapter. However, here it may be relevant if we allude further to Stephen Hawkins account in his book – A Brief History of Time explaining the state of the universe prior to big bang and at the time of big bang.

Here we are presenting a summary of same information for the benefit of the common reader. It is assumed, with good reason, that at the big bang itself, the size of the universe was zero; and it was infinitely hot. The temperature began to fall one second after the big bang and reached to about ten thousand million degrees – about a thousand time greater than that at the center of the sun. The universe at this time contained nothing but photons; electrons and neutrinos (extremely light particles that are affected only by the weak force of gravity) and their antiparticles, together with some protons and neutrons. In the process of expansion, electrons and anti-electrons were annihilated resulting in photons. Only a few electrons were left. There was no annihilation of neutrons and antineutrons. About 100 seconds after the big bang the temperature would have fallen to one thousand million degrees, the temperature inside the hottest stars. At this stage protons and neutron would have started to combine together to produce the nuclei of atoms of heavy hydrogen (deuterium) which contains one proton and one neutron. Similarly helium nuclei which contain two protons two neutrons were formed. It is likely that even heavier elements would have come into existence. Within a few hours after the big bang, the production of helium probably stopped. Eventually, when the temperature had dropped to a few thousand degrees, the electrons and nuclei started combining to form atoms. With expansion of the universe, the cooling process continued. Perhaps this is so even today.

However, in the earlier period as hydrogen and helium formed clouds but as the pressure increased with the rise of temperature (conversion of hydrogen into helium), the clouds stopped contracting any further. A stable condition was reached as is now obtainable in our sun's burning hydrogen into helium and radiating the energy as heat and light. Heavier elements like carbon and oxygen would be found in larger stars, which on bursting, are blown off. Accordingly, some of the heavier elements would be thrown off into the galaxy, providing material for the next generation of stars. Our own sun contains about 2% of those heavier elements because it is a second or third generation star formed some five thousand million years ago out of a rotating gas containing the debris of supernova. Most of the gas in the cloud went to form the sun or got blown away, but a small amount of heavier elements collected together to form in bodies that now orbit the sun as planets like the earth. About the earth Stephen Hawking records the following observation:

The earth initially had a hot atmosphere. In the course of time it cooled and acquired an atmosphere from the emission of gases from the rocks ...there was no oxygen but a lot of other gases that are poisonous such as hydrogen sulphide (the gas which gives rotten eggs their smell).

There is general agreement now that primitive life through random combination of larger molecules appeared in the oceans. The primitive life, it is believed, was in the form of bacteria which could thrive and reproduce in hydrogen sulphide and the metabolic process which ensued produced oxygen which entered into the atmosphere of the earth. In this manner, apparently, the way was paved for further evolution of life on earth. More about this will be discussed in subsequent chapters

The above description has several caveats which cannot be discussed within the limits of this chapter, yet, it must be pointed out and to which a reference has already been made, that all these events cannot be explained on the basis of the famous general theory of relativity for the reason that the theory not only fails to account for infinite density at the time

of big bang but all physical laws tend to break down as well. It appears that in the near future neither the unified theory of physics, nor the reductionist approach so dear to physicalists will be able to solve this riddle as well as many other mysteries associated with mind-brain processes. Already, voices are being raised for discovering new physics which could adequately explain away such phenomena as consciousness (the subject of chapters-4 and 5). It is obvious that when objects came into existence with the onset of universe after the big bang, the laws which regulated the essence of the objects, big and small, must have accompanied (even preceded) the big bang. It is, therefore, not surprising to speculate that physical and mathematical laws were obviously masters minded by the One, the Omniscient and the Omnipotent. Why then He left it to man to discover the laws as they existed and persisted. The answer is available in Iqbal's lecture on Knowledge and Religious Experience.³⁵

NOTES AND REFERENCES

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¹¹ Durant, W., *op. cit.*, page: 355.

¹² Durant, W., *op. cit.*, page: 364.

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¹⁴ Iqbal, M., *op. cit.*, page: 27,28.

¹⁵ A body at rest or in motion will continue in the same position until acted upon by external forces. The rate of acceleration of two solid balls of different sizes will be the same when rolled down on an inclined plane.

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³³ The electromagnetic attraction between negatively charged electron and positively charged protons in the nucleus causes the electrons to orbit around the nucleus. In the same way as the gravitational attraction causes the earth to orbit around the sun.

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CHAPTER – III

THE MYSTIQUE OF
CONSCIOUSNESS-I

Our journey towards an understanding of consciousness is beset with a number of difficulties. There are dark as well as gray areas which give only marginal insight into the nature of consciousness. However, in recent decades the subject has attracted the attention of physicists, biologists, psychologists and philosophers with equal enthusiasm. Yet, none of the recent data from any of these sources, as we examine it in depth, provide convincing evidence which may enable us to formulate a single unified theory of consciousness. In spite of this, sufficient information is now available which may help us carve out a path, tentatively at least, which can bring us closer to a judgment about consciousness and thus implicitly of religious experience as conceived by Iqbal. In his lecture on: The Human Ego— His Freedom and Immortality, Iqbal presents a candid analysis of human consciousness within which, as we examine it carefully, is wrapped his philosophy of ego (self). Drawing his inspiration from the revealed knowledge, he places emphasis on the “unity of life” and rejects the idea of “redemption” on the ground that man is the chosen of God, that man with all its faults, is meant to be representative of God on earth, and that man is the trustee of free personality which he accepted on his peril.¹ In sympathy with this approach, he turns to the “unity of human consciousness”, which, as he rightly

recognizes, constitutes the centre of human personality. He is right that this aspect, surprisingly, never really became a "point of real interest in the history of Muslim thought. With little information on this count, Mukallimeen² were led to propose that Soul (for our purposes, we prefer to use the word ego, or consciousness as we proceed further in our analysis) was a finer kind of matter; it dies with the body and is recreated on the day of judgment. This view of soul, however, is contraindicated when we speak of "unity of life" or even "unity of consciousness" (op. cit). If this be so, what then is the basis of unity of life or for that matter of inner experience, for which Iqbal has laboured hard to draw evidences from philosophy, psychology, physical sciences, and religion which he considers as one of the sources of knowledge. Irrespective of other considerations, Iqbal states that it is "Devotional Sufism alone which has tried to understand the meaning of the unity of inner experience"³,— finding culmination in the words of Hallaj "I am the creative truth." Such a 'bold affirmation', as Iqbal accepts, is merely indicative of the finite coming in contact with the infinite and finding a permanent abode in a 'profounder Personality'⁴. This raises the question—how do we validate this phenomenon epistemically? Let us see how is this defended by Iqbal? To begin with, the following quote from him may be illustrative:⁵

"The difficulty of modern students of religion, however, is that this type of experience, though perhaps perfectly normal in its beginnings, points in its maturity to unknown levels of consciousness— modern psychology has only recently realized the necessity of such a method, but has not yet gone beyond the characteristic features of the mystic level of consciousness (this aspect is dealt in detail in the next chapter). Not yet being in the possession of a scientific method— we cannot avail ourselves of its possible capacity as a knowledge yielding experience. Nor can the concepts of theological systems, draped in the terminology of a practically dead metaphysics, be of any help to those who happen to possess a different intellectual background. ... the only course open to us is to approach

modern knowledge with a respectful but independent attitude and to appreciate the teachings of Islam in the light of this knowledge, even though we may be led to differ from those who have gone before us." Keeping this in view, we will first examine in detail the nature of consciousness (ego, self) as substantiated by Iqbal, and then follow it up with some recent advancements in this area subjecting his views to a more searching analysis.

Having extracted from Bradley⁶ the reluctant admission on philosophical grounds that the self 'in some sense is 'real' and 'in some sense is an indubitable fact'; Iqbal proposes that the reality of consciousness (ego, self) is too profound to be intellectualized. The predictive truth of this statement is so exact that even after seven decades of intensive research on the subject a fuller understanding of consciousness remains elusive. Iqbal considers ego (self, consciousness) as a "unity of mental states... which do not exist in mutual isolation (but) are "phases of a complex whole called mind." Here, Iqbal leads us to the time old controversial "mind— brain problem". A problem which remains even today the focus of research into the neurophysiology of the brain. Recently, the problem has been addressed in two ways: first, the *materialistic monism*, which means that there is no reality other than that of space—Time—matter—energy—universe, and that there is no immaterial or spiritual reality. According to this view mental states just are physical brain states which can be explained on the basis of the worldview of physics (reductionism, physicalism, metaphysical naturalism). Second, *dualism*, the philosophical view which holds that both the material and spiritual domains have real existence. Iqbal certainly holds the latter view, though in his search for arguments, he, somehow cautiously, lands himself in the physical world, trying to draw support from the physical nature of the universe as well as psychology. There is nothing wrong about this since the voluminous literature on consciousness emerging from the works of scholars in physics or psychology is equally divided in its support for materialistic monism and dualism. We will discuss this aspect in detail in chapters 5 and 6 that follow.

Enumerating the characteristics of ego (self, consciousness), Iqbal enlightens us about his concept of ego. First, that ego is not space bound in the sense in which the body is space bound the time space of the ego (self, consciousness) is fundamentally different from the time-space of the physical events, though mental and physical events are both in time. The ego's (self, consciousness) duration is concentrated within it and linked with its present and future in a unique manner. True time duration belongs to ego alone. Here, it appears to us that Iqbal is trying to make a distinction between the serial time and "Divine time" to which he has referred in several of his discourses⁷. However, if relativity theory is operating in the physical universe, as we understand it today (time being the fourth dimension of space), and that neither absolute time nor absolute space exists, then, it becomes increasingly difficult to conceive the operational significance of Divine time in the schema of materialistic monism as a world view of choice for explaining functionality of consciousness (self, ego). Any attempt to place consciousness in four dimensions (except evolutionary paradigm) as has been done in a recent book: "Consciousness in four dimensions" (Pico, 2001)⁸, however, may be given due consideration. It is likely that new laws of physics have yet to be discovered (Penrose 1995)⁹ to understand the time characteristics embeded in 'Divine time' as conceived by Iqbal. We will have more on this in the chapters that follow. Second, referring to the soul-ego identity, Iqbal is rather skeptical of the metaphysical approach adopted by the Muslim schools of theology 'of which Ghazali was the chief proponent'. This school of thought regarded 'ego' as a simple, indivisible and immutable substance entirely different from the group of mental states (consciousness) and unaffected by the passage of time. Raising the question whether the soul entity is the center of our conscious experience or as a basis of immortality, he rightly points out that it neither serves psychological nor metaphysical interest. In support of this he admits into his fold a number of

arguments: (1) the transition of a purely formal state of thought to an ontological substance falls beyond the ambit of credence; (2) indivisibility of a substance (soul) does not mean that it is indestructible. Such a substance may evaporate into nothingness 'like an intensive quality' (Kant; Fallacies of Pure Reason);¹⁰ (3) the elements of conscious experience cannot be relegated to the qualities of a soul substance. In this way, distinguishing between 'soul substance' and acts of consciousness, he wonders how experience as qualities can enter soul substance or that soul substance can reveal itself in experiences. On the basis of these arguments, Iqbal makes a categorical statement that 'our conscious experience can give us no clue to the ego regarded as a soul substance.

Third, now treating the ego independent of soul, as conceived by Iqbal, he observes that "interpretation of conscious experience is the only road by which we can reach the ego. Elaborating on this, he identifies ego as consisting of "feelings of personal life", and is as such a part of the system of thought. Every pulse of thought, present or persisting, is an indivisible unity which knows and recollects. *"The appropriation of the passing pulse by present pulse of thought, and that of the present by the successor, is the ego."* Here he attempts a kind of relationship between thought and ego. Yet, ego is not considered as something 'over and above several converging experiences (thoughts). Thus, it is through the ego that one perceives, judges and wills. Because of its interaction with environment it is under constant tension. For supporting this concept he relies on the Qur'anic verse (17:85) making distinction between Khalq and Amr. "Whereas Khalq is creation, Amr is direction. Accordingly, Iqbal postulates that essential nature of ego (he uses the word Soul) is directive, as it flows from the Directive Energy of God, though we do not know how Divine Amr functions as ego unity." In essence, using this scheme of arguments, the conclusion is drawn that *"the real personality of a human (ego) is not a thing; it is an act"*. And all acts taken together are bound by unity of directive purpose or attitude. In this circumstance it is "disciplined by its energy

(Amr: The Qur'an 17:85). This means that soul or ego to this extent, proceeding from the Directive Energy, have a common flow from the same spring.

Fourth, there is no disagreement amongst current researchers on Iqbal's identification of the privacy of the ego (consciousness). For example, Peter William (2002)¹¹ commenting on the subject states: "On the physicalist's views that my mind is just my brain, it seems to follow that the person who knows most about my brain, would know most about my mind. Yet, however, much a third party knows about my brain they would not know about the state of my mind in the special way that I know it: a neurophysiologist can know more about my brain than I do, but he cannot know more about my mental life." Similarly, Thames Nagel (1987)¹² argues that "your subjective experience of tasting chocolate cannot be reduced to any objective physical event inside your brain because any such physical state is observable by a third party, whereas your experience is not. our experiences are inside our mind with a kind of *insideness* that is different from the way that 'your brain is inside your head'. Given the privacy of ego (self, consciousness), substantiated by current literature, we are not in a position to reach any conclusion as to the original relationship of this privacy, including the functionality of associated events, with material monism or dualism, unless we find out the relationship, which, if any, may exist between such terms as consciousness, thought and experience, as used by Iqbal, apparently interchangeably.

Fifth, Iqbal brings up an interesting preposition on the emergence of ego. Ordinarily, evolutionary biology taking life from Darwin's theory of evolution tells us that the process culminating in human consciousness has bestowed a unique survival value to human species (see next chapter). This thing apart, Iqbal draws inspiration from the following verses of the Holy Qur'an to build up his metaphysical arguments:¹³

Mere of clay We have created man: then We placed him, a moist germ; in safe abode; then We made the moist germ a clot of blood; then made the

clotted blood into a piece of flesh; then made the piece of blood into bones and We clothed the bones with flesh, then brought forth a man of yet another make. Blessed therefore be God – the most excellent of makers (23:12-14)

These are the most revealing and illuminating set of verses for a student of embryology. In Iqbal's view, the final ego of man is organized from a colony of sub-egos with a lower order of consciousness. This claim, in a way, receives eminent support from the well established biological principle of ontogeny repeats phylogeny, meaning thereby that the individual during its embryonic development recapitulates the morphological characteristics of its ancestors. Thus, as stated in the revealed verses, the fertilized human egg implanted in the uterus, develops through such stages as *morula*, *blastula*, *gastrula*, and *neurula* till it grows into a full organism. During the process, however, groups of cells (sub-ego) are transformed into flesh, bones, nerves, blood vessels and various organs. Iqbal's jargon interpreted in modern diction of biology simply means that it is through recapitulation of sub-egos (phylogenetic characteristics) that the final ego emerges and this happens under the Directive Energy (Amr). We believe that the expression: "yet another make" in the verses quoted provides a sufficient testimony to this interpretation. The Directive Energy, indeed, acts as an *ab initio* continuum on a substrate at the time of fertilization of an ovum with the sperm. This also receives support from the verse: "Man has been created in the best of forms" (30:4).¹⁴ We have more to say on the subject when we will deal with evolutionary biology and genetic code.

Sixth, regarding interaction with body or environment, Iqbal expresses the view that there is a constant influence of environment on the ego and vice-versa; ego is not a mere silent spectator. In fact, it is a dominating force (energy); in final analysis guiding the actions of the body. Even "if the body takes an initiative, the mind enters as a consenting factor at a definite stage in the development of emotions, and this is true of other external stimuli as well, which are

constantly working on the mind. It is the mind's consent which eventually decides the fate of an emotion or a stimulus." This leads him to the question about the freedom of ego. Using such characteristics of ego as: (1) that "the ego is not something rigid"; (2) that "it organizes itself in time"; (3) that "it is disciplined by its own experience"; (4) that "streams of causality" as noted above, "flow into it from nature and from it to nature; and (5) that "the ego determines its own activity in the spatio-temporal order by the same mechanism as prevails in nature" (see also chapter 2 on the World of Physics), and comes to the conclusion that "the element of guidance and directive control in the ego's activity clearly shows that ego is a free personal causality. He shares in the life and freedom of the Ultimate Ego, Who by permitting the emergence of finite ego, capable of private initiatives, has limited his own freewill. This freedom of conscious behaviour follows from the view of ego activity which the Qur'an takes. There are verses which are unmistakably clear on the point."¹⁵

'And say; the truth is from your Lord, not them, then who will, believe; and let him who will, be an unbeliever. — (18:29).'

'If you do well to your own behoof will ye do well'; and if ye do evil against yourself will ye do it — (17:7).'

Given this freedom of ego permitted by the Ultimate Ego, under the spell of His Directive Energy (Amr), it emerges as a dynamic force "to retain the power to act freely as a constant and undiminished factor in the life of the ego." On this score, though not agreeing with Spengler, Iqbal completely negates what he calls (a) the most degrading type of Fatalism which has permeated into the social fabric of Islam, mainly due to political expediency; unfortunately almost universal acceptance of this kind of Fatalism by playing on the freedom of ego, as we examine it historically, has narrowed down the world view of Islam and has robbed the Muslim life of the dynamic impetus which Islam originally bestowed upon its followers. The following quote from Iqbal may be of some help in tracing the rise of Fatalism:¹⁶

"Now the practical materialism of the opportunist Ommayad rulers of Damascus needed a Peg on which to hang their misdeeds of Karbla, and secure the fruits of Amir Mawiyah's revolt against the possibilities of a popular rebellion. Mo'bad reported to Hasan of Basra that Ommayads killed Muslims and attributed their acts to the will of God". This strong message of Iqbal which has a splendid logical and pragmatic basis needs to be understood comprehensively by the Muslim youth in the context of true spirit of Islam. It is also equally important that theologians of today should grow out of the literal interpretation of the concept of destiny and take Iqbal's understanding with the attention it deserves. In this regard attention has to be paid to the following views of Iqbal:¹⁷

'But since Muslims have always sought the justification of their varying attitudes in the Qur'an, even though at the expense of plain meaning, the fatalistic interpretation has far reaching effect on Muslim peoples'

Seventh, before leaving this discussion, we briefly take up the phenomenon of immortality as expounded by Iqbal. This has strong links with the personality of ego (consciousness) as discussed above. We are doing this for the simple reason that it has a bearing on our main theme that is the nature of contact of finite with the infinite. We have already traced the characteristics of ego as enumerated by Iqbal. For Iqbal, ego cannot be equated with soul as understood by theologians. It is not rigid, nor is it a substance. It has an identity distinct from the body, the two having mutual influence over each other; yet, the ego playing the dominant role. It organizes itself through its own energy apparently in serial time compatible with spatio temporal order of the body. The question then is that when death occurs (man is mortal, finite) what happens to Ego? Iqbal's arguments on this count are mostly metaphysical, drawing support essentially from various verses of the Qur'an. In the first instance he rejects out of hand what he calls "the most depressing error of materialism", which supposes that finite consciousness exhausts its object (body). Nor could he agree with the mechanistic view of consciousness which considers "ego activity as a succession of thoughts and ideas ultimately resolvable into units of sensation"—this being another from

of atomic materialism which forms the basis of modern science. True—for the physicalists death is the end of life (see next chapter also). As opposed to this, and in order to give strength to his thesis of ego, Iqbal has emphasized on the concept of 'unity of life' and 'unity of consciousness'. From the unity of life, we understand the unity of ego and body; the former though not a substance is organically related to the body. How? This as yet is not fully understood.

Now, in a way as the arguments run, the ego is immortal and at the time of bodily death finds a new abode in 'Barzakh' which according to 'sufistic experience' is a state of consciousness characterized by a change in the ego's attitude towards time and space." This brings out a beautiful relationship between ego and Divine time, discussed earlier. This dual perception by ego of serial time in mundane matters and of Divine time in the inner religious experience in the life of a mystic or a prophet has been noted earlier. The approach is fully enunciated by Iqbal in the following words:¹⁸

If this be so, our present physiological structure is at the bottom of our present view of time (serial time), and - ego survives the dissolution of this structure, a change in our (ego) attitude towards time and space seems perfectly natural.

Let us examine what caveats can be traced in this statement of Iqbal. The assumption is made that physiological structure of the body is dissolved and thus the perception of serial time disappears in as much as ego is concerned. This is acceptable only if we have a clear concept of Divine time. Unfortunately, under the present state of our knowledge there is little that we can present from the science of physics. Yet, the psychological outreach of this area cannot be ruled out. For the second assumption that it finds a new abode in Barzakh (again entirely based on mystic experience) finds no apparent support from scientific basis. Yet, the fallacy can be eliminated if we accept the earlier argument made by Iqbal when he distinguishes normal experience (verifiable) from inner religious experience (ordinarily non verifiable). Perhaps new psychology is in the process of discovering methods by which such an experience can be

subjected to experimental analysis. Nevertheless, the arguments advanced by Iqbal that nerve impulse takes time to reach consciousness has some merit, this we will discuss in the chapter on *Mystique of Consciousness II*, especially in connection with Eccles' and Popper's work (1972)¹⁹, in which Eccles has proposed a theory of "psychon" related to the passage of nerve impulses within the brain. Be this as it may, Iqbal's contention is well taken when he argues that

such enormous condensation of impression which occurs in our dreams - life and the exaltation of memory, which sometimes takes place at the moment of death, disclose the ego's capacity for different standards of time.

The state of Barzakh, therefore, does not seem to be merely passive state of expectation; it is a state in which the ego catches the glimpse of fresh aspects of Reality, and prepares himself for adjustment to these aspects. It must be a state of great psychic unhingement; especially in case of full grown egos who have naturally developed fixed modes of operation on a specific spatio-temporal order, and mere dissolution to less fortunate ones. However, ego must continue to struggle until he is able to gather himself up, and win his resurrection. It is the consumption of life-process within the ego. In the same vein Iqbal remarks:

*It is with the irreplaceable singleness of his individuality that the finite ego will approach the infinite ego to see for himself the consequences of his past action and to judge the possibilities of his future.*²⁰

These concepts are neatly supported by Qur'anic verses quoted by Iqbal in the *Reconstruction*. (see the chapter on the Human Ego - His Freedom and Immortality in the *Reconstruction*). The depth of Iqbal's analysis though difficult to understand is perfectly in line with the revealed knowledge and makes a rich contribution to the understanding of Islam by the modern Muslim if his intellectual capacity is not blinded by the myth of classical theology. (See also Naim)²¹

Eighth, in closing this chapter, we would like to comment upon the terms: thought, consciousness, and conscious experience as used by Iqbal in defining the characteristics of ego, we have already dealt with the difference which Iqbal

draws between soul and ego. Iqbal makes a categorical statement that

We see that our conscious experience can give us no clue to the ego regarded as a soul substance." Similarly, he writes; Yet, the interpretation of our conscious experience is the only road by which we can reach the ego...the ego consists of the feelings of personal life, and is, as such, part of the system of thought. Every pulse of thought present or perishing is an indivisible unity which knows and recollects. The appropriation of the passing pulse by the present pulse of thought and that of the present by its successor, is the ego.²²

The above quotes from Iqbal provide a sufficient justification for a student of psychology and, perhaps that of natural sciences as well, to analyse the relationship between thought, consciousness and ego. This we will do presently, comparing Iqbal's interpretations with some recent works on the subject.

In 1949, Donald Hebb,²³ a psychologist, made an intensive study about the mechanism underlying thought and consciousness. He concluded that "*mind is the capacity of thought; consciousness is a present activity of thought; and thought itself is an activity of brain.*"

Based on neurophysiological studies he presents the view that a hierarchy of neural assemblies ranging from simple to complex is present in the brain. When a simple assembly is stimulated, the same stimulus is passed on to other more complex assemblies. A series of such events has been called a phase sequence—the thought process. In support of the presence of cell assemblies, Hebb cites an experiment which he conducted on chimpanzees he had raised in laboratory. From birth he could control their every stimulus. Such animals, he noted, exhibited spontaneous fear upon seeing a clay model of a chimpanzees' head, which chimps, Hebb knew, had never seen a decapitation, yet some of them screamed, defecated, and fled from their outer cages to the inner rooms where they were not within the sight of the clay model; those that remained within the sight stood at the back of the cage, their gaze fixed at the model in my hand (Hebb, 1980).²⁴ From this experiment conclusion was drawn that (a) the reaction of the chimps were clearly not reflexes, nor could they be explained as conditioned responses to the

stimulus and (b) they could have earned no behavioural rewards by acting in such a manner". This experiment it was argued was a testimony to the presence of cell assemblies and tells us about the origin of thought process when all these cell assemblies are sequentially stimulated. Hebb's work (1949)²⁵ has been supported subsequently by a number of studies (Milner, 1993;²⁶ Rapport, 1952;²⁷ Rochester et. al., 1956;²⁸ Smith and Davidson, 1962;²⁹ White, 1961)³⁰ Much more on the subject is described in the next chapter. This important work of Hebb and others (op. cit.) lends remarkable support to Iqbal's concept of "the system of thought", though, at that time he was unaware of the hierarchy of nerve cell assemblies in the brain. Hebb's theory of stimulation of nerve cell assemblies in sequence over a time frame does not stop here. We have already noted Hebb's concept of phase sequence, in which one thought leads to another under the guidance of external stimulation and is closely related to consciousness. Iqbal on the other hand relates the "system of thought" (a Hebb phase sequence) to ego. Are then consciousness and ego identical?

Now to answer this question we take stock of the characteristics of consciousness and ego as advocated by Alwyn Scott and Iqbal respectively. Though Iqbal conceded that ego is nothing but a succession of thoughts, yet, he holds the view that the emergence and appropriation of thought in succession in the jargon of Iqbal does not represent true consciousness as we find it in ourselves. According to him "consciousness is something single, presupposed in mental life, and not bits of consciousness reporting to each other."³²

This description of consciousness is acceptable if we grant that my succession of thoughts at a given time for a given event provides consciousness about the event in question. For example, if I know from my experience that touching a hot iron rod will bring me pain, the chain of thoughts will bring an awareness at that moment, and will make me conscious that I should not touch the hot rod. Only a child will touch the hot rod because he has no previous experience

of such a hazard. If I do so it will bring me pain, clearly then consciousness and awareness go together. One cannot but agree both with Iqbal and Alwyn Scott that consciousness is a "present activity of thought: however, beyond this statement, Iqbal makes a series of tangled arguments through which he draws the conclusion that this view of consciousness (op. cit.) far from giving us any clue to the ego, entirely ignores the permanent element in experience. We are afraid that such is not the case, since if consciousness is taken as awareness; it can only be conceived as a continuum of a succession of thoughts appropriating the past, the present and the future. In our opinion, therefore, a thought, unlike the position taken by Iqbal, is not irrevocably lost. It becomes a permanent asset of the system of thought, seeking abode in the crevices of the memory dispersed in the brain. This is how an almost permanent stairway of consciousness is developed through thought, experience, knowledge, and awareness. In fact, expressed elsewhere, in the *Reconstruction*, this interpretation of consciousness supports Iqbal's view of mutually penetrating multiplicity of thoughts based on experience.

Having examined the views of Iqbal on the nature of the ego and its relationship with the concept of soul as understood by Mutkalam in tandem with consciousness, thought process and experience, it is time now to find out how Iqbal distinguishes between serial time and Divine time. This seems necessary for the reason that, as proposed by Iqbal, ego is the only legitimate path through which the possibility of religious experience can be explored. Now to understand the space-time characteristics of the ego, one has to have an appreciation of the dual perception of time by the ego; one in relation to the body (serial time) and second in relation to the Ultimate Ego (Divine time). The main Qur'anic verses from which Iqbal extracts his evidence for Divine time and space are reproduced below from his discourse on: "The spirit of Human Culture".³¹

O company of Djin and men if you can overpass the bounds of Heaven and Earth, then overpass them. But by power alone shall ye overpass them ... "(55:33). Again", And verily towards thy God is the limit.

Interpreting the last cited verse Iqbal remarks:

This verse embodies one of the deepest thoughts in Qur'an; for it definitely suggests that the ultimate limit is to be sought not in the direction of stars, but in the infinite cosmic life and spirituality.

Unfortunately, for a pure physicalist (monistic materialist), there may be no joy in this verse. For him material is the beginning and material is the end. There is no room for soul or ego in his lexicon, especially the manner in which it occupies a central place in the activity of life as understood by dualists, and as unfolded in the revealed knowledge. Yet, there is plenty of room for the psychologists to ponder over it and seek evidence for the Divine time and space in the domain of religious experience (mysticism).

Obviously, the properties of Divine time as well as of Divine space are not the same as that of serial time. We understand that in the latter case we pursue Newton's laws of motion and even Einstein's theory of relativity in which time is merged with space. The reader may revert to Plank's constant (the limit of size) as described in the chapters on the Word of Physics. Since both time and space as we use in the current scientific jargon are factors of human imagination or better the cognitive limit, the expression 'And verily towards God is the limit' is difficult to experience on usual mathematical and physical grounds. The appreciation of Divine time and Divine space, as the case may be, according to Iqbal's persistent emphasis, belongs only to 'religious psychology' by which he means higher Sufism. This is why the idea of hyperspace being discussed in recent times as distinct from perceptual space, first proposed by the Muslim mathematician Nasir Tusi (A.D. 1204 - 74), finds favour with Iqbal (see also next Chapter). Within the same stream of arguments Iqbal takes into his fold a quasi scientific approach in which he distinguishes three levels of space, namely, the space of material bodies (any physical object) the space of

subtle bodies (for example air and sound) and third the space of light. The space occupied by a subtle body like light does not disturb the space occupied by another subtle body, (air or another stream of light) though some kind of space continues to exist between these subtle substances. The existence of such an order of space can only be appreciated at the level of *intellectual perception*. The certitude of this perception may be acknowledged in various wave lengths comprising sound energy or light energy notwithstanding the fact that element of distance is not entirely absent from these variety of spaces. Thus, agreeing with Iraqi, Iqbal concedes that "the highest in the scale of spatial freedom is reached by the human soul (ego) which, in its unique essence, is neither at rest nor in motion. Thus passing through the infinite varieties of space we reach Divine Space which is absolutely free from all dimensions (ordinarily known to humans from scientific schema) and constitutes the meeting point of all infinities. On this count Iqbal pays tribute to Iraqi in the following words:³²

From the summary of Iraqi's view you will see how a cultured Muslim sufi intellectually interpreted his spiritual experience of time and space in an age which had no idea of the theories and concepts of modern mathematics and physics.

In spite of this long discussion on time and space, Iqbal has mostly stayed in the metaphysical domain, which is hardly verifiable experimentally. More so, even today, there is neither such mathematics nor such physics which can prove or disapprove the concept of Divine time and space for the concrete mind. There is a hope, however, that the unified theory combined with the biology of mind, now in the making may be able to explain through its ultra physical approach the secrets of Divine Time and Divine Space. May be, more than physics psychology may come to help us out. We will examine these aspects in chapter-6. Yet, at this stage, while closing this chapter, we must remind the reader that we will be treating the words ego and consciousness as cognate, *albeit* concentrating on consciousness which has been the subject of extensive research in recent years.

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CHAPTER – IV

THE MYSTIQUE OF
CONSCIOUSNESS-II

In the preceding chapter we have made an attempt to extract from various discourses of Iqbal (Reconstruction), the views he has articulated about ego, soul, consciousness, thought, self, space and time. Ego, according to Iqbal, as we have seen, is not identical to soul in the sense in which it has been understood by the Mutakalimin. Nor is it a rigid substance occupying space like a physical object. He (ego) organizes all its acts through its own energy. His perception of time and the way it organizes his freedom, is in serial time with reference to the body and nature, but after death it enjoys the luxury of Divine Time and Divine Space. All actions of the ego are regulated, though freely, by the Directive Energy (Amr) infused ab initio at the time of fertilization of ovum by the sperm and subsequently by the accumulation of sub-egos, during embryonic development ultimately leading to the emergence of the final ego. The freedom, which the ego carries, is a deliberate act of the Ultimate Ego bestowed on man as the chosen one of God. This be so, Iqbal makes a categorical statement that it is only consciousness through which we can understand the nature of the ego. Given this approach adopted by Iqbal there are several aspects, irrespective of their soundness, which are likely to attract the attention of a concrete mind. First, whether Ego and Consciousness are two faces of the same coin? In this regard we have already advanced some arguments in the last chapter. Suffice to reiterate at this stage that in our opinion, as the

modern researches also show, it is difficult to distinguish between ego and consciousness on the basis of characteristics enumerated by Iqbal. We will present more evidences on this count when we deal with phenomenology. Second, we must clearly identify whether Iqbal's thesis on ego categorizes him amongst the dualists or monistic materialists or somewhere in between the two when he differentiates normal experience (experimentally verifiable) from spiritual experience (inner religious experience)? Third, whether the existence of Divine Time and Divine Space have any perceptual means for a human living in serial time? Again for the concrete mind under the spell of the world of physics, it is a fundamental issue. We will examine this as we proceed further in our discussion. Fourth, whether our concept of space and time based on Newton's laws of motion and gravity and that of Einstein's general theory of relativity which merges time with space as its fourth dimension, and states that neither time nor space are absolute, have any meaning for predication of the space of God from the perceptual space in the world in which we live? Fifth, what is the nature of matter in the light of modern researches in physics (part of which we have discussed under the 'unified theory' in the chapter on the World of Physics) and what bearing, if any, it has on such concepts as phenomenology as related to consciousness? Lastly, whether some aspects of biology and the complicated assemblies of neurons have some basis for consciousness? Certainly, for a student of religious psychology and that of natural sciences, these are penetrating questions, though difficult to answer, yet having a high bearing on our theme of inner religious experience (finite-infinite contact). We now proceed to address these questions relying on the information available from current literature.

But before doing so, let us dispose off mind-matter controversy. This controversy stems from several approaches which have been used for its resolution. Some of these approaches lend a powerful support to Monistic materialism and include, among others, behaviorism (William James),¹ functionalism, linguistics (Wittgenstein)², Qualia³, reductionism

and phenomenology⁴. As compared to this, dualism stands its ground on the basis of equally powerful arguments.

The views of the reductionists, (physicalists) have been repeatedly stated, though briefly, in the earlier chapters. Unlike the physicalists, Iqbal makes a clear distinction between the normal experience (which is verifiable, and which is entirely based on the theory of matter as advocated by physicalists, and inner religious experience, normally non-verifiable which because of its non-material nature is apparently a consequence of higher consciousness (ego). This brings Iqbal closer to Descartes' dualistic approach. Yet, there are a few differences which will be discussed as we expand the subject subsequently. For the present we will focus our attention on consciousness (ego) as understood by adherents of monistic materialism. To be able to appreciate their viewpoint, it is considered worthwhile that reader is briefly acquainted with the structure and function of the brain. This will give us a useful insight into the emergence of consciousness from the point of view of neurophysiologists and evolutionary biologists.

Essentially, the human brain during embryonic development as it grows at the front from the neural tube is divided into three distinct regions, the forebrain, the mid-brain and the hindbrain (fig. 4.1).

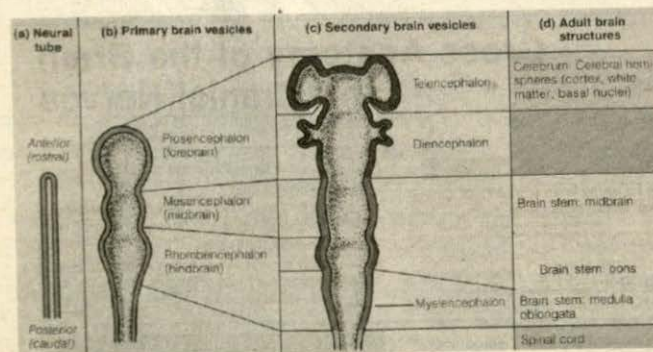


Figure 4.1: Embryonic development of human brain. The adult structures are derived from the neural tube shown in left column (a)

In a fully developed human brain, the forebrain constitutes the cerebral hemispheres (two, one left, one right), the thalamus and hypothalamus. The midbrain and hindbrain taken together constitute the brain stem consisting of medulla oblongata and pons enveloped by cerebral hemispheres. The cerebellum is an outgrowth from the midbrain seen behind the cerebral hemispheres. All parts of the brain are made up of nerve cells called neurons. Reference may be made to Fig 4.2 to get a mental picture of various parts of the brain.

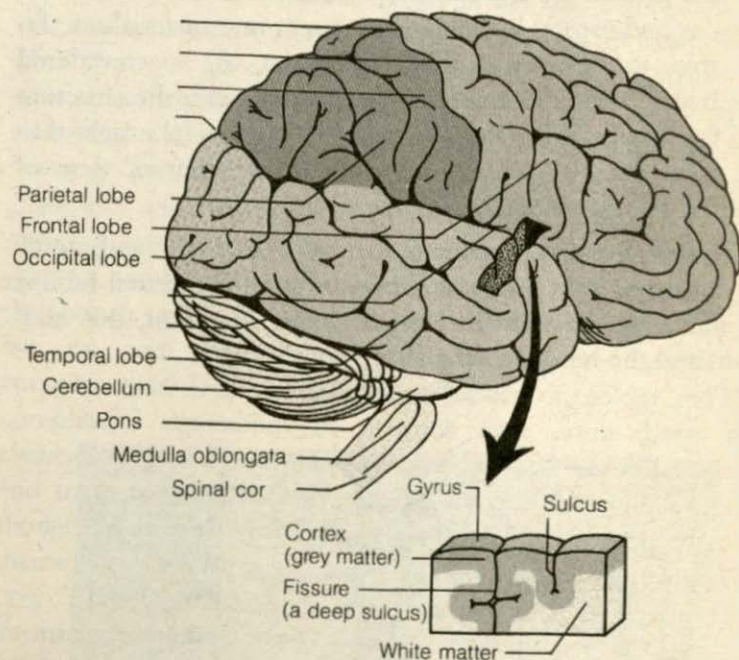


Figure 4.2 –(a) Right lateral view of the brain. Showing various areas of the brain; (b) a portion of microscopic structure of the cerebral cortex.

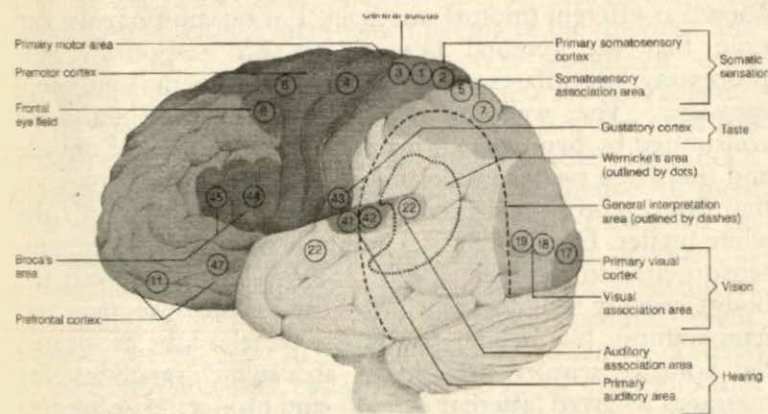


Figure 4.3: Functional areas of the left cerebral cortex.

The human species is characterized by evolutionary advancement of cerebral hemispheres which are larger in weight and volume (in proportion to its body) compared to any other animal species. The two hemispheres, right and left, are clearly separated from each other by a depression called longitudinal fissure. All over, on the surface of each hemisphere there are raised convoluted areas called Gyri (singular gyrus) and depressions called Sulci (singular sulcus). Each hemisphere is divisible in various lobes; namely (a) frontal in front; (b) temporal on the side; (c) the parietal in the middle on top and (d) occipital behind. Each lobe is the seat for designated functions as shown in figure 4.3

The designated functions for the right side of body are represented on the left hemisphere and those for the left are represented on the right hemisphere. The two hemispheres are bridged internally through nerve fibers, constituting what is known as the Corpus callosum. The inside of the hemispheres have cavities known as ventricles. These cavities and other cavities in various parts of the brain are interconnected and filled with a fluid called cerebro-spinal fluid. The two hemispheres receive messages from inside and outside the body (the sensory messages, also called afferent), process them, and then send messages back for necessary

action in accordance with the requirement of the message received. These returning messages calling for action are known as efferent (motor) messages. For our purpose we can note that the cerebral hemispheres are responsible for processing the afferent (incoming) and efferent (outgoing) messages. The walls of the cerebral hemispheres are constituted by two types of materials: the gray matter outside and the white matter inside (figure 4.2b). It can be imagined that the cerebro-spinal fluid is in contact with inside of the white matter. Examine Fig 4.3 and note that primary somato-sensory area in the parietal lobe receives impulses from the body's sensory receptors (such as those for pressure, pain and temperature). Just behind this in the parietal lobe is located the somato sensory association area which analyses the messages received (afferent stimuli)—and producing awareness about pain, coldness, light, and touch, among others. The messages from other special sense organs are perceived in specific areas located in other lobes of the hemispheres. For example, the visual area (for the eye) is located in the occipital lobe, the auditory area (for the ear) is located in the temporal lobe, and the olfactory area is deep within the temporal lobe.

The primary motor area which is responsible for sending back messages to the body for required action is located in the frontal lobe. Located in the lower part of parietal lobe of left hemisphere is a small specialized area called Broca's area which organizes the articulation of words (speech). Furthermore, of particular importance for us is the prefrontal area in the frontal lobe which is involved in intellect, complex reasoning and personality. This area will be the focus of our attention when we will examine carefully its neurophysiology on the emergence of consciousness. Generally speaking, each hemisphere is a "specialist" in certain ways. For example, the left hemisphere is the "language brain" in most of us because it is associated with language skills and speech. The right hemisphere is more specifically concerned with abstract, conceptual or spatial processes – skills associated with artistic or creative pursuits. The cell bodies of all neurons involved in cerebral function are found only in the gray matter of the brain called the cerebral cortex. The white matter below is composed of nerve fibres only (Figure 4.2b).

Now refer to Fig 4.4 and examine two other important areas of the brain namely, *Diencephalons*, the hind portion of the forebrain, and the brain stem which belong to the midbrain and hindbrain. In diencephalons two very significant areas functionally stand out in human brain. These are (a) Thalamus and (b) hypothalamus. To the brain stem belong the pons and medulla oblongata, the cerebellum, another important functional area, is an outgrowth of the hindbrain. All these brain structure are constituted by nerve cells (neurons). An aggregation of neurons within the brain tissue is identified, as nucleus. Many such nuclei are present in various segments of the brain. For ease of simplicity we avoid examining them. However, we will refer to them, if necessary, when we describe the neurophysiological basis of emergence of consciousness. Note that brain stem and other structures lie on the underside of the cerebral hemispheres almost covered by them and can thus be seen in a section of the brain cut from the middle from above downwards as seen in Fig 4.4.

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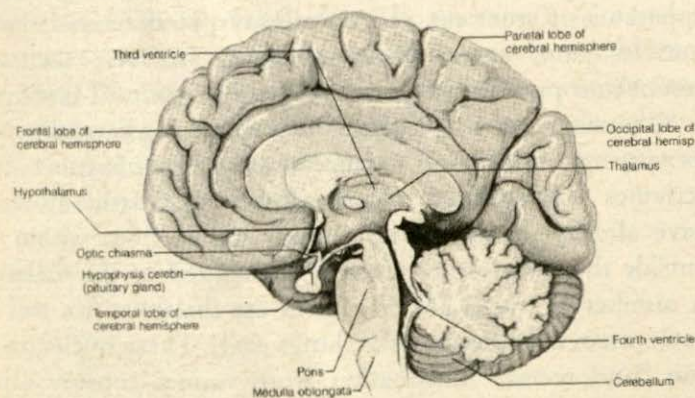


Figure 4.4 Section of the brain especially showing diencephalon and brain stem (adapted from Marieb, E. N. 1996).

The diencephalon though a part of forebrain occupies the front end of the brain stem. It consists of two large lobes of

gray matter in thalamus. The two lobes are connected by a bunch of neurofibres. All information from sensory areas of the body is integrated through the thalamus and relayed to somato-sensory area in the cortex of hemispheres. Hypothalamus which lies below the thalamus, is involved in regulating the body temperature, water balance, metabolism, sex, hunger and thirst; sensory nerves (the optic nerves) which originate from the modified neurons in the eyes cross each other (coming one from the left eye and the other from the right) below the hypothalamus forming the optic chiasma. A relay station for olfaction (smell) is located in the mammillary bodies residing in the floor of hypothalamus.

Refer to Fig 4.4 again and trace the thalamus in the midbrain. At its back lies the hindbrain which comprises medulla oblongata and pons. The cerebellum is made up of outer cortical area of white matter (nerve fibres) like the cerebral hemisphere. The cerebellum is concerned with unconscious coordination of skeletal muscle activity, and control of balance and equilibrium. Nerve fibers from the apparatus of inner ear, visual pathways, tendons and skeletal muscles etc., enter the cerebellum. In fact, then, the cerebellum presides over the state and position of body parts at all times. For example, imagine a tennis player, maintaining its varying posture and balance during a tennis game. Such activities are regulated by the cerebellum. Furthermore, we have already noted that all sensory inputs from within and outside the body are received and analyzed by the thalamus. A number of nuclei are present in the thalamus (we will not name them in order to make things easy). These nuclei on the one hand receive information from various sensory inputs and on the other hand are connected with the regions of the cerebral cortex in two way traffic through nerve fiber tracts. In essence, then, it can be stated that thalamus provides a coordinating function between the higher order sensory processing (cerebral cortex) and the sub cortical motor systems. The important point we are making is that thalamus existed prior to the evolution of cerebral cortex. Accordingly,

assuming that evolutionary process has been at work for millions of years, we have no hesitation in concluding that the rise of new cerebral cortical system as a higher order integrative system continues to receive analyzed sensory information from the ancient sub-cortical structure, like thalamus and brain stem.

With this description of the brain we have cleared the way for understanding the emergence of consciousness as conceived by Physicalists and Biologist. Furthermore, the same description will be of help to a searching mind who would like to delve deep for a comprehension of any theory of consciousness. However, his understanding will be like a squandered sum of beads originally bound together by a string, unless he attains some knowledge of the units which came together in billions and constituted the matrix of the brain. These units are called nerve cells (or neurons). Man is born with a fixed number of billions of neurons with identical physiological functions, though the number of neurons which play active part in the rest of man's life is only about 25% of the neuronal cell mass of the brain. The question before us is - what is the structure and organization of a neuron and how it functions? We have already indicated that some neurons are sensory (receiving message from sense organs) while others are motor (sending messages to the body for appropriate action. Yet the structure of all neurons are identical.

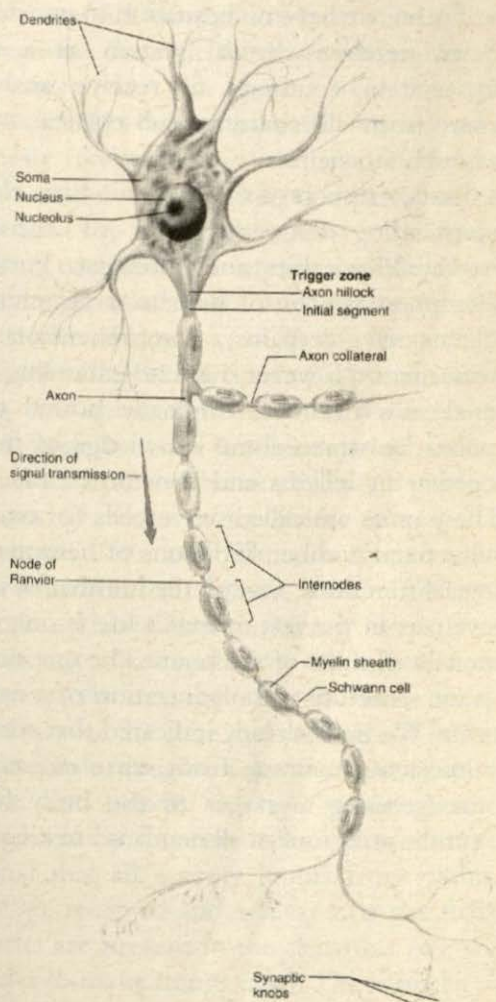


Figure 4.5- Typical structure of a neuron. Note the body of the cell, the dendrites and the axon

Examine the structure of a neuron as presented in Fig 4.5. Note (a) the cell body with a nucleus in the center; (b) a large number of tree like branches coming out of the cell body called dendrites; (c) a single long process, called axon, making contact with tree like branches of dendrites of another neuron; and (d)

in cases where axon does not go on to make contact with dendrites, its tip branches off and makes contact with the muscle fibers. The message carried by the axon, let us say for contraction of a muscle is chemically passed on to the muscle along a gap between the point of contact of the axon and the muscle. We are now able to understand that bundles of axons from modified neurons in sense organs of the body (eyes, ear, smell, touch etc.) make up what may be called sensory nerves. The bundle of axons from motor neurons of the brain (various parts) makes up what may be called motor nerves. Repeatedly we have used the word message or impulse. What does this mean and how is this impulse generated and propagated by the apparatus of a neuron? Indeed, as we know it today the whole process is electrochemical and electromagnetic. This is depicted in Fig 4.6. In simple words this may be described as follows: (For a larger image see end of the book)

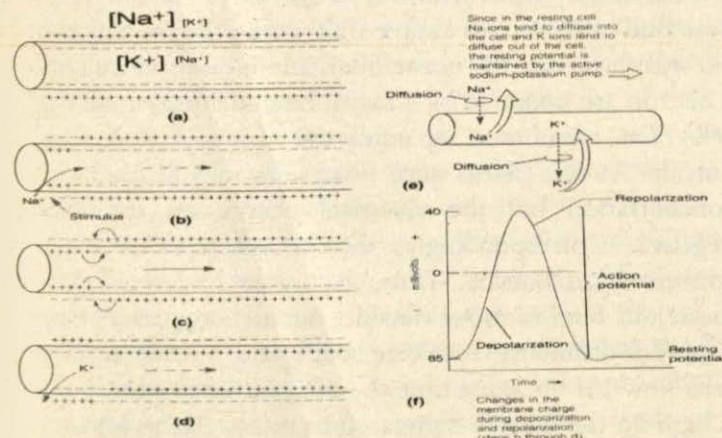


Fig. 4.6: Showing the physiology of nerve impulse

The nerve impulse. (a) Resting membrane potential (-85 mV). There is an excess of positive ions outside the cell, with Na^+ the predominant extracellular fluid ion and K^+ the predominant intracellular ion. The plasma membrane has a low permeability to Na^+ . (b) Depolarization—reversal of the resting potential. Application of a stimulus changes the membrane permeability, and Na^+ ions are allowed to diffuse rapidly into the cell. (c) Generation of the action potential or nerve impulse. If the stimulus is of adequate intensity, the depolarization wave spreads rapidly along the entire length of the membrane. (d) Repolarization—reestablishment of the resting potential. The negative charge on the internal plasma membrane surface and the positive charge on its external surface are reestablished by diffusion of K^+ ions out of the cell, proceeding in the same direction as in depolarization. (e) The original ionic concentrations of the resting state are restored by the sodium-potassium pump. (f) A tracing of an action potential.

Figure 4.6: Showing the Physiology of Nerve Impulse:

- (a) Resting Membrane potential (-85 mV). Note excess of positive Sodium Ions $[\text{Na}^+]$ outside and the excess of positive potassium $[\text{K}^+]$ Ions inside.

- (b) Depolarization which reverses the resting potential;
Sodium Ions enter inside and action potential is initiated.
- (c) The resting potential is restored; behave Sodium goes out,
and K^+ comes in
- (d) A tracing of an action potectia

Stimulus is any thing which can bring about a change in *status quo*. Take for example the number of individual sparks (stimuli) triggered by the reading of this sentence at this moment, the neural impulses ignited by this book in the relevant neurons of the brain cannot be calculated. But we do know as to what is happening in each neuron - which for all intents and purposes for a neurophysiologist (or psychologist) is the smallest indivisible unit of consciousness and can help us appreciate the "beauty and complexity of summed up mechanics of the units of human consciousness (?) We may not necessarily agree with this as we will show it later. Let us now find out how this simple unit works? Examination of Fig 4.6 will show that the nerve fiber, and indeed the cell body of a neuron are bounded by a membrane identical in all types of cells. The membrane separates the inside of fiber from the outside. At rest (*status quo*) Potassium ions inside have high concentration but the electrical charge on the inside is negative. Correspondingly, the potassium ions have low concentration outside. Thus, according to law of diffusion these ions tend to move outside, but are stopped by electrical potential difference between inside and outside resulting in zero flow. At the same time the concentration of sodium ions is high on the outside compared to inside. These ions tend to move inside, but are prevented by the same electric potential difference (-65m volts). Now what happens when stimulus arrives at some point in an axon? The stimulus, if good enough in strength, changes the permeability for sodium ions at that point, opening what are called sodium gates in the membrane. Resultantly, sodium ions enter in an bring about change in the inside and outside charges on the membrane at that site of the stimulus; the inside becoming positive and the outside negative. The electric potential difference falls to -45

mv. In this way an electric wave is generated (see Fig 4.6). Since this is an electro chemical process, energy is generated and a stimulus is provided for further propagation of the nerve impulse. Two points should be noted. At the site left behind by the nerve impulse, the potassium ions again move in and sodium ions are pushed out. And are restored as in the resting state. Accordingly, *Status quo* is resumed; the electric potential again rising to -65 mv on the inside. Also the propagation of nerve impulse is an all or none phenomenon, meaning that if the stimulus is weak, that is below the threshold, then, in spite of the presence of weak stimulus there will be no change in the permeability of the membrane and consequently there will be no nerve impulse. The rise of nerve impulse and its propagation only happen if the stimulus crosses the threshold.

This raises another important question. If one tree in a forest is put afire, not only the fire may spread to the whole tree, but may also set ablaze the whole forest. Now we know that there are billions of neuron having trillions of dendrites in the brain. Thus, like the forest, as one nerve cell is stimulated, many other cells are activated because of axon-dendrite connections. However, in practice this may not happen since at the branching points of the dendrites the stimulus may be stopped and may not be allowed to pass into the body of the cell and onward to the axon of the cell. This mechanism is of special interest to us for exploring the theory of consciousness based on nerophysiological approaches.

The process can be best described in the words of Pico (2000). "All sensory realities are based upon cellular functions (of neurons) where physics of matter and energy become the biology of nerve impulses and neurotransmission." This is a straightforward materialistic view point (to be discussed in detail later on), which recognizes the transformation from physical to the biological. If this line of argument is pursued then, there is little we can present for a further transformation of biological to spiritual, a subject which received highest attention from Iqbal in the *Reconstruction*.

However, to be able to stay with Iqbal we need to explore further the properties of a neuron, the unit of consciousness, so that we can locate a genuine basis, if any, about the mechanism involved in the proposed contact of the finite with the infinite. This is problematic, but not without rationale, as we will show later. The difficulty however is that even at this time, the search for knowledge and understanding of the biological universe, its operational manual and secrets – are not fully known: For instance, we do not know about the absolute basic code of information transmission from neuron to neuron in the nervous system. We do not know the full set of computational rules that operate in a single neuron or a network of neurons. We do not know exactly if, where, and how the nervous system represents the external and internal environments. Does it happen in the same way as the electromechanical circuits and mathematical equations, expressed together in computer simulation? In our opinion, the physics and mathematics of computing are all man made constructs and are far removed from the complexities of information processing in biological systems like the neurons and the neural networks. We have, therefore, no hesitation in making a statement that we, as yet, are far removed from a further understanding of mathematical operations—the algorithms, of the nervous system. A computer scientist may be proud of creating a binary code (0/1) which through a series of basic state transitions can solve both simple and complicated mathematical problems, yet no such code, as we know, is applicable to the non-linear mathematical computations taking place during the stimulation of a neuron. How do the neurons then function? And what is the basis on which the code, computes the representations resulting from sensory stimuli? Shanon and Weaver (1949)⁵ and Weiner (1948)⁶ have suggested that “information is present in any system in which entropy and order change, from quantum states to biological events, to the electronic circuits of computer systems to neural networks”. On the face of it, this statement may be of

considerable importance. However, there is a wide conceptual gap between the digitized mathematical computations by trillion of binary operations performed by computers and the computational process in the synaptic zones of the nervous systems. Essentially, the difference lies in the fact that a single neuron is performing a spatiotemporal integration of each stimulus moment which may or may not result in generation of action potential. This explains as to how we impose our concept of computation on a nerve cell function. Interestingly enough, computation by a single cell and computation by a neural network may or may not follow the same set of operational rules. *This be so, and as Pico (2000) has remarked:*

Hype, hope and illusion must be understood and respectfully separated from insight if we are to make progress in our efforts to reveal the neural computational code.

The issue we have raised about the computational process residing in a neuron and a neural network are germane to exploring our understanding of the nature of religious experience as predicated by Iqbal from the mystic experience of great Sufis of Islam. In fact, even in the prevailing state of our knowledge, one must yield to the impression that “it is only recently that we have begun to understand and conceive the nervous system as the substrate of computation and behavior. We are limited and humbled, in our understanding of the basics of neural function when we begin to speak of such thing. . . . This is not a sad state of affairs, as the nervous system is the most complex biological system known. It is mere an indication of how much more we have to discover, how much more beauty and excitement holds for the interested” (Pico, 2000)⁷. Are we, then, standing at the same level of conceptualization of inner religious experience as in 1930 when Iqbal presented his discourses in the *Reconstruction*. Perhaps yes, perhaps no. This we will examine as we develop the subject further for the appreciation of the concrete mind. Indeed, for this purpose we have to come to terms with genetic code which resides in the deoxyribose neuclaic acid

(DNA) expressing itself differently in different cellular groups. On this count, it is enough to point out that behavioral activity exhibited by a sum of cells in a house fly is not identical with the behavioral activity exhibited by a sum of cells in a pigeon. The difference lies in the evolutionary scale of DNA and much expanded neural networks in the pigeon, let alone man in which it reaches new heights of complexity with an underpinning for the rise of consciousness.

So much for the functional operation of a neuron, and to some extent of the neural networks. We will now present a brief account of sensory and motor inputs and outputs to which a cursory reference has already been made earlier. The sensory inflow reaches the brain through sensory nerves from the ear (auditory), eye (visual) nose (olfactory), tongue and digestive system (gustatory) and chemical, mechanical and thermal receptors from the body (somato sensory). The later sensory tracts travel along the spinal cord and in the main enter the brain stem. Thalamus is the major site where the sensory stimuli are received in its various nuclei. The thalamus, through various tracts is in a two way contact with the cerebral cortex (neocortex). It should be of interest to the reader that thalamus is the ancient brain. In animals without a cortex, the thalamus performed both sensory and motor functions. However, as the cerebral cortex evolved, the thalamus was made subservient to the higher order control exercised by the cerebral cortex. We have already noted the map of motor and sensory areas in the cortical lobes of the cerebral hemispheres. At this stage, further description of thalamus is beyond our scope. However, two areas of the thalamus, namely, the hippocampus and subiculum must be kept in sight because of the significant role they play in the overall memory system operating in the brain. Through these areas, the thalamus maintains a two-way traffic with the prefrontal cortex to be discussed soon. But first we will have a look at the cellular composition of the neocortex in which the cells are arranged in six layers (Fig. 4.6).

Thousands, then millions, then tens of millions of neurons form the cortex. The basic six layers of neo-cortex are in place by the sixth month of foetal development. Cells in various layers are organized to perform sensory or motor functions as dictated by the messages received from thalamus and other parts of the brain. For example, afferent (sensory) messages brought from thalamic nuclei form very dense synaptic zones in layer III, but layers I and III also receive information from other neocortical areas. Efferent (motor) axons emerge from layer II and III. Similarly axons from layer III are projected into the thalamus. Apart from this, it must be mentioned that fibres from thalamus ascend virtually to all parts of neocortex. This holistic picture of inter connectivity between thalamus and neocortex along sensory and motor pathways not only illustrates the complexity of neural networks, but also illuminates the evolutionary stairway of consciousness which, according to Iqbal, is subservient to the Directive Energy of God from conception through human development. How? We will hypothesize later.

Now we are left with one more area of the neocortex, namely the prefrontal integration module (PIM) which is known to be associated invariably with the emergence of consciousness. Fig. 4.7 shows the inflow of messages to and from the PIM. For a physicalist the neurobiological model (as proposed) of consciousness rests upon the foundation of structure-function relationship. Thus, corner stone of this foundation is the prefrontal integration module (PIM). This module is supposed to undertake physical computational function (integration). In structure it resembles the design of neocortex. The difficulty though is that so far we have not been able to define the exact dimensions, cellular components, synaptic patterns, informational content or specific biomathematical operations performed in the PIM.

The operational process may therefore at best be considered as a "heuristic construct". One PIM is present in each prefrontal lobe of the two hemispheres and as indicated

above, informational products from various parts of the brain converge upon PIMs (Fig 4.7). The biologists consider it as a "Living, structured, multi modal information space and that it is a location where the other two multi modal representation, constructed in parietal, and frontal cortical lobe and in the hippocampus systems may be further transformed into even higher order representation." Now after due analysis, the apparent output from each PIM disseminates this representation to other regions of the cortex and to entire neural axis. It is important to note that the information which

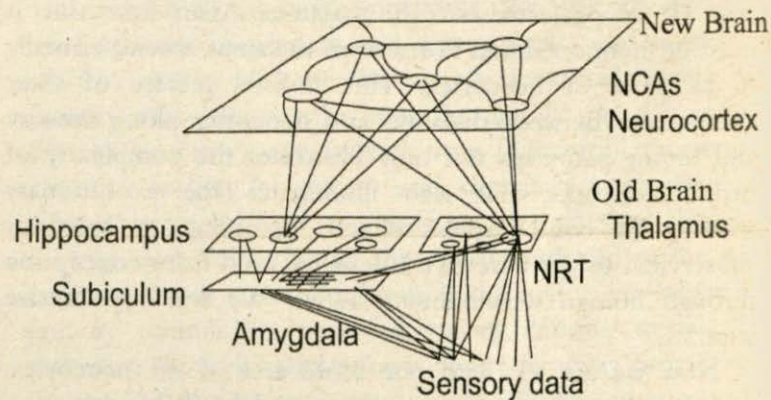


Figure 4.7- Inflow and outflow of messages from the outside world into and out of two strata of the brain namely thalamus (the old brain) below and cerebral cortex (the new brain) above.

converges upon the PIM includes (a) representation of all external unimodal and multimodal and internal stimuli from the sensory worlds; (b) representation of the real time spatial environment; (c) representation of the recent and distant past sensory movements (memories) and (d) the timing and coordinating influence of the thalamus. Furthermore, the efferent fibres (motor) that arise from various sites of PIM include (a) cortical fibres to adjacent PIM; (b) Fibres connecting the PIMs in the two hemispheres; (c) projections to neocortical regions; (d) projections to hippocampal areas; (e) projections to memory system cortical areas; projections

to thalamic nuclei, (basal ganglia and amygdala and several descending tracts).

In summary, then, it can be concluded that "it is in the PIM that we see the most complete representation of the sensory worlds, the ultimate point representation that can be achieved by nervous system computation, the most comprehensive binding in time of two dimensional (2D) and three dimensional (3D) stimulus information possible. (Pico: 2000)⁸."

The same author has reduced the whole concept into a simplified mathematical equation. In sum, the computations performed in the synaptic field of PIM (a region of electrochemical and electrogenetic, graded current flows) is proposed to be an integral function (see also Hebb, 2001)^{8a} created by the biophysical structure of the sustaining cellular and extracellular system of organic brain. Importantly enough, it must be emphasized again that in the model suggested, "the biophysical methods by which the brain derives information from sensory processing may be radically different from the many theories that relate the brain's operations to those of electric circuits, computers or point-to-point so called neural networks. How embarrassing for a student of physics and a philosophic reductionist. Needless to say that there exists something higher than presently established laws of physics, or even the advanced approaches of psychology. What lies beyond this will be explored in a later chapter keeping in view the perspective of Iqbal's concept of inner religious experience. Suffice to say at this stage that even from the pure physicalists point of view there is considerable room for moving in this direction (see, for example, Popper and Eccles, 1972)⁹, keeping also in view that the functional consequence of PIM activity may be seen as reinforcement or inhibition of ongoing behavioral and homeostatic activities, in addition to its contribution to the memory system (Pico, 2000)¹⁰.

We close this Section with a statement that thoughts and consciousness are linked in tandem. In the state of consciousness PIM produces thoughts encoded in axon systems that reach the other PIM, creating a time sequence within the PIMS. Whereas, the representations of the sensory

world drive the computational model, the indivisible temporal dimension of consciousness is embedded therein. The infinite variation of thoughts in a way is associated with experience and thrown back into memory by the PIMS as unique to the past, present and future of consciousness. Still the caveat remains, for instance of space-time in the serial and Divine modes. This may call for a different frame of reference. A reference to which Iqbal alludes to repeatedly in his discourses.

Having dealt with brain with some understanding of the structure and function of neurons and neural networks, we now proceed to examine in some detail approaches to consciousness which have emerged during the last century. First, we will explore the scientific and philosophical basis of consciousness and then follow it up with its psychic dimensions which have been of intense interest to spiritualists and mystics (as is the case with Iqbal. See also, for example, Forman (1994)¹¹. However, at the outset we will like to draw the attention of the reader to the confusing use of terminology dealing with the central theme of consciousness. For instance, one may find the use of such terms as mind, cognitive system, system of mental states, psyche, soul, ego and consciousness. Yet, their overlap of meaning cannot be overlooked. Accordingly, we will confine ourselves to the use of consciousness (mind or ego) for which we have made a case in the preceding chapter.

Having developed the neurophysiological basis for the functions of the brain in the preceding sections for the concrete mind we are now in a position to take up Iqbal's views on time, space and consciousness. Since consciousness has been a subject of extensive research during the last few decades, it will be of interest to discuss the new information in the context of Iqbal's vision as presented in the *Reconstruction*. To begin with, let us find out how Iqbal weaves a golden fabric studded with glittering jewels through a well coordinated array of ideas, thoughts, logic and metaphysical acumen. In his discourse on "The Philosophical Test of the

Revelations of Religious Experience", Iqbal makes a beautiful presentation on the genesis of various levels of experience including consciousness in the following words:¹²

Passing now to other levels of experience – life and consciousness, consciousness may be imagined as a *deflection from life*. Its function is to provide a luminous point in order to enlighten the forward rush of life. It is a case of tension, a state of self-consciousness, by means of which life manages to shut out all memories and associations which have no bearing on a present action. It has no well-defined fringes; it shrinks and expands as the occasion demands. *To describe it as an epiphenomenon of the process of matter is to deny it (as having) an independent activity, and (thus) to deny the validity of all knowledge which is only a systematized expression of consciousness*. Thus consciousness is a purely spiritual experience of life which is not a *substance*, but an organizing principle, a specific mode of behavior essentially different to the behavior of an externally worked machine. *Since, however, we cannot conceive of a purely spiritual energy, except in association with a definite combination of sensible elements through which it reveals itself*, we are apt to take this combination as the ultimate ground of spiritual energy.

In the above quoted passage, Iqbal makes a few intriguing statements which call for an in-depth analysis. **First**, Iqbal does not accept that consciousness is an epiphenomenon of the process of matter, which denies it an independent activity. Soon we will argue about this in the context of recent literature on phenomenology. **Second**, that knowledge *per se* is a systematized expression of consciousness. **Third**, that consciousness is not a substance. It is a purely spiritual experience, and is simply an organizing principle. **Fourth**, since consciousness as spiritual energy is difficult to conceive of a concrete mind, it can only be legitimized in "association with a definite combination of sensible element through which it reveals itself. **Fifth**, the conclusion is drawn that the combination of the spiritual energy with sensible elements can be taken as 'ultimate ground of spiritual energy'. Thus, taken together, the arguments advanced are illuminating, though difficult for a concrete mind to assimilate.

Furthermore, by denying that consciousness is not an epiphenomenon of matter, Iqbal rightly distances himself from the proponents of monistic materialism; notwithstanding the fact that he identifies sensible elements (sense perception), for example, the neural networks and organized structure of the brain which in combination with sense organs constitute the substrate of consciousness. This position brings him somewhat closer to Descartes, who talked about the mysterious connection between mind and body (though for Iqbal soul is nonmaterial). This we believe places him amongst the dualists? However, more exciting is the conclusion that combination of "consciousness" and sensible elements can be taken as a ground for spiritual energy. Earlier, we have built up arguments on the strength of Iqbal's distinct differentiation between "Khalq" (creation) and "Amr" (Directive Energy). In line with that we maintain that in the above paragraph it would have been more appropriate, for reasons of intellectual consistency, that the word Directive Energy should have been used in place of spiritual energy. It may be recalled that earlier we have taken refuge under the umbrella of Directive Energy when we were describing the emergence of ego (consciousness) or even sub-egos. In our opinion, experience, memory and thought are a compact of consciousness (ego). Accordingly, experience whether spiritual (so called non verifiable) or non spiritual (verifiable) remains experience as a part of the same compact. Accordingly, spiritual experience cannot be considered in isolation simply because of its alleged non verifiability scientifically, which by and large is a consequence of human limitations. This also does not mean that one has to fall necessarily in the trap of monistic materialism. For this we will argue using current evidences in a subsequent chapter. This brief critique on the paragraph cited, in no way, is meant to lessen the importance of Iqbal's thoughts on consciousness. Nor an attempt to nullify its significance. If anything, we intend to amplify the same so that the concrete mind, which, as Iqbal desired, should be able to get a fuller

appreciation of the process involved in experience - consciousness relationship. May be for this purpose we have to move away from metaphysics and take shelter under the biophysics of the brain.

Iqbal certainly distances himself from reductionists and does not subscribe to the view that the discoveries of Newton in the sphere of matter and energy and those of Darwin (1859) in the sphere of natural history reveal a mechanism based on physics, energy and atoms with self-existing properties. On this count Iqbal rightly conceives that reductionists have no respect for spiritualism, because of their sole reliance on reality as revealed by science. Indeed, on the question of arriving at reality through scientific observation and experimentation, Iqbal submits it to a critical analysis. For him, and rightly so, "what is called science is not a single systematic reality. It is a mass of sectional views of Reality - fragments of a total experience which do not seem to fit together. Natural science deals with matter, life and mind; but the moment you ask the question how matter, life and mind are mutually related, you begin to see the sectional character of the various sciences." Nothing could be farther from truth as the above statement depicts. What to speak of other sciences, even in physics, as we have discussed in a previous chapter, so far attempts to develop a unified theory for resolving the dilemma between the classical physics and quantum physics have met with little success. The string theory proposed by modern physicists is only a beginning in that direction (see chapter on the World of Physics). We have already argued elsewhere that in relation to consciousness, cause, which, according to physicalists, is prior to effect, takes a different "garb of end and purpose." The last two act from within unlike "the cause which is external to the effect." The position taken by Iqbal, however, does not in any way deny the response of the body to external stimuli. Yet, it gives a new meaning to consciousness responding to both internal and external stimuli. This line of thought is consistent with the idea explored by Iqbal that ego (consciousness) reveals

itself in "combination with sensible elements." What happens and how it operates when detached from the body at the time of death is a subject related to the immortality of the ego (consciousness) which we do not intend to bring into discussion at this stage.

Another feature of consciousness on which we will place high emphasis in expanding Iqbal's theory of religious experience is described by him in the following words:

It is a case of tension, a state of self consciousness, by means of which life manages to shut off all memories and associations which have no bearing on the present action.

We are amazed at the clarity and ingenuity with which Iqbal has isolated the periods of ego isolated from the sensible world (somato sensory) for the purpose of an end which it finds in the infinite. When he wrote these words, neither neurophysiological nor physical basis were available to support this contention. However, we now stand at a different pedestal. The new advances in psychology made in the last couple of decades throw a fresh light within the frame of reference exercised by consciousness (ego). How? We will expand it subsequently using a set of evidences drawn from adherents to monastic materialism and dualism. Suffice to refer at this stage to a quote from Alwyn Scott (1995)¹³ that

Throughout the past century, the chasm between details of mechanistic explanation of the brain and the ever present reality of conscious awareness has continued to yawn. Whatever mechanistic explanation one might construct to explain the nature of mind (consciousness, ego?) one can well imagine the same mechanism working without the feeling (sensitivity). Reductive materialism fails to bridge the gap.

Let us now take a brief plunge into the relationship between consciousness and time as conceived by Iqbal. We have already dealt with serial time and to a limited extent, with Divine time as well. The observation of Iqbal that "conscious experience means life in time", gives new dimension to our frame of reference in consciousness of what he calls the movement of self from center-outwards. On this basis he identified two aspects of self, namely, the appreciative and efficient. The efficient self interacts with the

"world of space" and is the one invariably appreciated by psychologists (the practical self of daily life). In this format it "discloses itself as nothing more than a series of specific and consequently numerable states." This leads him to the conclusion that in this relationship with the outside, self lives in serial "time" which we predicate as long and short and which forms the fourth dimension of space. On the other hand appreciative self which reveals itself "in the moments of profound meditation, when the efficient self is held in abeyance (and) that we sink into our deeper self and reach the inner center of experience. In the life process of this deeper ego (consciousness) the states of consciousness melts into each other." In making this distinction between efficient self and appreciative self, on very legitimate grounds, Iqbal presents a unique approach which has no parallel in the history of scholastic philosophy. However, it is only recently that Barry Daiton (2000)¹⁴ in agreement with Iqbal's thoughts has drawn attention to the distinction between inner and outer experiences in the following words:

By outer experience I mean sensory experience (efficient self of Iqbal), the experiences of the surrounding world our sense organs give us, the deliverances of sight, touch, taste and smell. The realm of inner experience includes all forms of consciousness that seem to be located within our bodies – (certainly), the range of experiences that seem to occur within our head, those which we take to be most intimately associated with our minds (conscious thinking).

Further, the depth of Iqbal's insight becomes obvious when he observes that "the unity of appreciative ego (self consciousness) is like the unity of the term in which the experiences of its individual ancestors exist, not as plurality but as a unity in which every experience permeates the whole". This beautiful expression has been interpreted by us previously when we evoked the biological principles of ontogeny repeating phylogeny during development, notwithstanding the fact that the process continues throughout life; its abode being the appreciative self in which serial time is "Pulverized into a series of now – a pure duration unadulterated by space." This

may have sound metaphysical basis; yet, it will not be surprising if it is challenged on scientific grounds which seeks verification of every postulate in spite of its sectional nature in grasping reality piece-meal. Happily, however, this view of Iqbal is supported by an indefatigable modern philosophical idealist, Ruth Nanda Anshen and we quote from her: "what has natural science to do with consciousness? In the first place science should recognize its limitations. It cannot, for example, examine the numenon (object of intellectual intuition devoid of all phenomenal attributes) through its scientific methodology. Since science is concerned exclusively with the phenomena, science is inevitably reductionist. Science should become more humble The program of science is the correlation of cause and effect (instead of purpose and end as proposed by Iqbal), and as such no examination of consciousness is possible for science."

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THE BIOPHYSICS OF
CONSCIOUSNESS

With a view to developing a unified theory of ego (consciousness, mind and self) which could be favourably tested on the touchstone of metaphysics and science, we have already collated basic information dealing with physics and neurophysiology in chapters 2-4. We have also summarized, in the preceding chapter, the views of Iqbal on the rationality of normal as well as religious experience. In his discourse on "Is Religion Possible?" Iqbal, in a penetrating analysis, has taken the position that binding with religion has to be taken in three phases, namely, (a) that a whole people must accept religion as an unconditional command without any rational understanding (the approach of theologians)—an attitude which may be of consequence in the social and political history of a people but may not be of much consequence in so far as individual's inner growth and expansion are concerned; (b) rational understanding of the discipline and the ultimate source of authority (scholastic approach)—bordering on metaphysics and maintaining a logically consistent view of the world with God as a part of the view; (c) displacement of metaphysics with psychology in which life develops the ambition to come into direct contact with the ultimate Reality. This is a period in which, according to Iqbal, "an individual releasing himself from the fetters of law, discovers the legitimate source of the law within the depth of his own consciousness (ego). The above categories

identified by Iqbal are difficult to dispute. Yet, it is the last named category which has posed serious problems of understanding in the history of science. The following words of a Muslim Sufi that "no understanding of the Holy Book is possible until it is actually revealed to the believer, just as it was revealed to the Prophet"¹ may be of interest to the students of religion. Indeed, it is this theme, that is, the contact of the finite with the infinite which we have kept in focus throughout our presentation, and we will continue to pursue the same as we proceed further. In this chapter we propose to review some recent advances in the fields of physics and neurophysiology which are likely to enrich our understanding of consciousness (ego, mind and self) *albeit* with a focus on Iqbal's theme of inner religious experience.

To begin with, we will recall some of the structural elements of brain which we have described in chapter-4. An understanding of neural networks between these structural elements (afferent and efferent) may give us a possible clue to the operational mechanism of consciousness as explored by neurologists. (Pico 2000)² has presented an excellent account of the same in his book: "Consciousness in Four Dimensions". For our purposes we will present a simplified version of the same for comprehending the hypothesis involved. Some parts of the brain which may be of interest to us include: the neocortex, the prefrontal integration modules (PIMs), the somato-sensory areas of the cerebrum, the thalamus along with hippocampal complex, the amygdla, the subiculum and the reticular nucleus. The transfer of afferent (sensory) and efferent (motor) messages between thalamus and neocortex has already been emphasized. *However, of utmost importance is the prefrontal area, one in each frontal lobe which has been identified as the site of integration of all sensory and motor activities of the brain. Each prefrontal area is comprised of three modules designated as prefrontal integration modules (PIMs). The PIMs are interconnected within the same prefrontal area and also with PIMs of the corresponding prefrontal area in the other hemisphere of the brain. The hippocampal complex (which includes subiculum, amygdla and reticular*

formation) is for storage and retrieval of all kinds of memory based on learning and experience. With these structures in our mind we can now appreciate how the PIMs play their integration role in computing sensory and motor activities when the sensory messages converge upon it and motor messages emerge from it. It must be re-emphasized that the computational code employed by the PIMs is in no way identical to computational code of a machine like the computer. In spite of several advances in neurophysiology, the neural code has yet to be discovered, although some preliminary indications for this are available in the theories of Hebb³, Eccles⁴ and Watson⁵ to be discussed later in this chapter.

Based on the neurophysiological and behavioral evidences, we can visualize the basic inventory of potential afferent (sensory) axon sources reaching the PIMs. These include (a) sensory projections from association neocortex, parietal, temporal and prefrontal cortex; (b) hippocampus, (c) memory system projections from subiculum, entorhinal and para hippocampus regions, (d) thalamus and (e) brain stem reticular nuclei and basal forebrain projections. Thus, the afferent stimuli converging on the PIMs arrive from external and internal three dimensional (3D) sensory worlds, spatial environment, recent and past sensory moments (memories) and the coordinating functional activity of thalamus. As these sensory messages are computed in the PIMs they are transmitted for necessary action to the efferent fibres which emerge from the PIMs. These include: (a) those connecting the adjacent PIMs, (b) those connecting the homologous PIMs, (c) those connected with neocortical regions, (d) those connected to entorhina-hippocampus complex (spatial), (e) those connected to memory cortex system and (f) those connected to subcortical thalamus and basal ganglia. All these connections converging on (sensory) and emerging from (motor) the PIMs are diagrammatically represented in Fig 5.1. A complete understanding of this diagram is a *sine qua non* for a fuller appreciation of the computing and integrating role of

the PIMs, since some of the theories advanced by physicalists as well as neurophysiologists rely heavily on the pivotal role of PIMs in brain function, and possibly on consciousness (to be discussed elsewhere).

On the basis of above description, it may be argued that there is one complete operational cycle between the stimulus (sensory) that arrives at the PIM from various parts of the brain and that which leaves (motor) the PIM. If such is the case then one can easily conclude that there should be a time lag between the incoming (sensory) and outgoing (motor) activities regulated by the PIMs. This has been worked out by Pico (2000) through an equation in terms of efferent representation. Now, since PIMs have an intimate relationship with the memory system of the brain, it has been suggested that: *"the converging past and present information may be highly similar, resulting in a positive correlation between afferent (sensory) and efferent (motor) representation in the PIMs."* On the other hand, *"if the afferent inputs of the past contain very different or contradictory representations, a negative correlation is computed by the PIMs."* Accordingly, PIMs may influence behavioral action (at that moment) with strong inhibition or slight inhibition; strong reinforcement or slight reinforcement, as the case may be, depending on no past experience. In this way fields of PIMs produce a millisecond to millisecond influence on the exiting state of the overall nervous system operation. It may, however, be realized that nature invariably provides escape mechanism and it may not be construed that PIMs performing the major integrating function is the only brain area assigned with this task. It appears that "the PIMs have the capacity to bind in time only higher order sensory representations which do not fall within the purview of sensations of light, sound, touch or taste, lying outside the bounds of brain stem. The following quotation on this count from the same author (op. cit.) may be illustrative:

What occupies the PIMs in an informational structure carried in wavefronts of neural activity that conveys the current contextual parameters derived from two dimensional or three dimensional combination of internal

and external sensory energies (stimuli) and their historical beneficial or decreitory (non beneficial) impact (obviously based on past experiences and memory).

In summary then, at a given time, the incoming sensory influence and the outgoing motor action proceed at a pace which has a direct relation with (a) the genetic code; (b) the association (assemblies) of neuron which become functional during development, and (c) the nature of the stimulus. Apart from this no other computational analysis is necessary for the nervous system to continue its moment to moment function. Nevertheless when higher order informational comparison of context and memory that cannot be performed anywhere else in the nervous system, the PIMs' computational output may create an efferent code (motor) that has a significant biasing role on the ongoing behavioral flow of life. This leads to the conclusion that efferent outflow of a PIM either reinforces various behaviors or internal functions, modifying them, or, at most, inhibiting the continuation of a previously ongoing behavior. Thus, when such multidimensional computations are involved embracing past to future movement calculations, the PIM subserves all those activities which fall under the definition of such terms as working memory, attention, understanding, social awareness and moral judgment (Pico 2000). Now the question may be raised that "for all their convergent and higher order computation activity, where in the fields of PIM activity do we need to invoke a focal PIM of consciousness for a given activity at a given moment?" In answer to this question a functional shifting of the dominant focus from PIM to PIM across neural activity time has been proposed.

Viewed in the perspective of evolutionary time scale we can consider the emergence of human consciousness from a preconscious animal brain in a four-dimension time-space reference, resulting from genetic modifications. The complicated yet efficient manner in which prefrontal integration modules organize awareness through input (sensory) and output (motor) computational integration is

posited by scientists as the seat of consciousness (physicalist view). However, whereas consciousness and prefrontal integration modules have evolved in parallel and have added to the survival value of human species as claimed, it is difficult to conceive that consciousness and PIMs constitute a single package, since consciousness, for all intents and purposes, does not occupy any space, Nor do we know about the computational code operating in the nervous system. This is further complicated by the non-linear nature of action potentials as they move along the axons pushing the messages past the synaptic zones. More important, however, is the question raised by John Searl (1995)⁶ as to "What Does Evolution Really Tell us About the Function of the Mind?" Whereas he identified the intentionality of thought as a key element in consciousness, the same does not fit well with evolutionary theory and for this reason *to reduce (explain) the mental activity of intentional thought in terms of some non-mental process e.g., physical brain events, and/or evolutionary advantage, cannot succeed. On the same subject, a secular neurophysiologist, M. Glynn (1993)⁷ offered the following skepticism about consciousness which appeared in the Biological Reviews of the Cambridge Philosophical Society: I want to discuss a problem which was first posed a century ago, which is important, which is still not solved, and yet which is very largely neglected.*

Glynn certainly does not subscribe in his discourse to the idea that consciousness is simply an epiphenomenon of the brain and an evolutionary artifact of Darwin's struggle for existence. For these reasons we continue to maintain, in agreement with Iqbal that coming into existence of the universe was the result of élan vital, or what he calls the 'Directive Force (Amr). It is the same force which, a priori, unleashed the evolution of the organic from the inorganic and of the living from the organic. The Directive force continues to operate unabated in the arena of genetic modifications during each cycle of human development in a probabilistic quantum mechanical manner. We will have more to say about this when we deal with higher consciousness and inner religious experience. Now having examined the status of brain structure and function especially the PIMs, we may revert to some

recent studies on consciousness (self and ego) which encompass both monistic materialism (reductionism) and dualism. Materialistic monism is the philosophical view which states that there is no reality other than of space-time, matter, energy, universe and that there is no immaterial or spiritual reality. On the other hand, dualism is the philosophical view holding that material and spiritual domains have real existence.

This is how the two opposing philosophies have dominated the human mind during the last few centuries. A monistic solution of the mind brain problem is taken to be the proper scientific goal of neurophysiology, by a majority of researchers in this field. They believe that scientists must always believe or at least work under the assumption that everything in the universe has its full explanation in the properties of atoms, and the laws of physics and mathematics (Iqbal's own thesis contradicts pure physicalism). Such an inflexible position taken by physicalists is at best limited, if not erroneous. Conception of science - a conception based on prejudice against the God of the Qur'anic Muslim Faith or the biblical Christian Faith. The prejudice of physicalist is abundantly evident, for example, in the article of Nobel Laureate, F.H.C. Crick (who received Nobel Prize for his discovery of DNA structure in 1959)⁸. In one of his articles: "The Brain", he observes:

Is there any idea we should avoid? I think there is at least one: The fallacy of the homunculus (i.e., the hidden personal intelligence in the brain) The reason is that we certainly have (merely) the illusion of the homunculus: the self.

It was Descartes who proposed that mind and brain interact in a mysterious way. This dualistic interaction philosophy was like a beacon of light to guide many neuroscientists through the complexities encountered in studies on consciousness. Our poet-philosopher's thoughts in the early twentieth century were not different. Reading carefully through the *Reconstruction* the dualist approach of Iqbal becomes obvious, especially, when he continues to distinguish between the reality both of normal experience

(verifiable) and religious experience (ordinarily not verifiable). However, as predicted by Iqbal, we now have streams of new thought supporting dualism in spite of an onslaught of materialistic monism. See for example S. Searle (1995)⁹; Glynn (1993)¹⁰, and Watson (2003)¹¹. The bias expressed by Dr. Crick, a public atheist, is revealed when he declares that a monistic solution to brain-mind problem is the only possible one for a scientist, though this position is considerably weakened when he accepts that he has no explanation for his 'illusion' of a homunculus. In the same vein when Dr. Crick published his book: *The Astonishing Hypothesis* (1994)¹² supporting materialistic monism as the only solution to understanding consciousness. J. J. Hopfield reviewing Crick's book in the Journal, "Science" (1994)¹³, pointedly referred to the following comments of another Nobel Laureate-Physicist Richard Feynman:

Richard Feynman, who throughout his life had spent considerable time pondering the question of how his brain worked, replied that consciousness was a fascinating subject that he had not been able to define in an operational sense. It was therefore not amenable to experiment or to mathematics and thus lay beyond the confines of the science.

Again, Hopfield concludes his review of the "Astonishing Hypothesis" in the following words:-

The Astonishing Hypothesis is full of contradictions In my view until an operational definition is given to 'awareness' independent of the brain of humans, there is no way a science can be made out of consciousness. I side with Feynman in that regard. Crick in side stepping this issue, in the long run defeats his own programme. Like many acts of heroism, this one fails to reach its good.

On the strength of the critique on materialistic monism from various renowned physicalists and neurophysiologists, it can be safely assumed that dualism is as yet not a dead philosophy. It has its own adherents with equally forceful evidences which we will now proceed to examine. In doing so we will keep in view the thoughts of Iqbal, while exploring at the same time the new avenues, hitherto unattended by the students of ego (consciousness).

It is now positively recognized that great progress in understanding of biochemical and neurological mechanisms has not yet led to the comparable progress in understanding of higher cognitive functions of the mind (consciousness, ego, self). Nor, so far, we have been able to evolve a unified theory of cognition. Attempts have been made by students of artificial intelligence to provide a human face to computational sciences. Yet, the model of John Anderson (1975)¹⁴ constructing high level cognitive phenomena or the one started by Xerox PARC Company to design Model human processor have met with little success. Similar caveats have been cited in the "unified theories of cognition (Newell, 1990)¹⁵. At best, using the computational neuroscience some success has been achieved which is restricted to low level cognition (Amit, 1989; Churchland, 1992; Murze, 1992)^{16,17,18}. In spite of these advances, understanding about consciousness has remained elusive and primarily maintained at a philosophical level (Hofstadter, et. al.; Dennet, 1991)^{19,20}. Some exceptions which apparently seem successful, however, may be of help in a futuristic time frame (Baars, 1988; Edelman, 1989; Taylor, 1991)^{21,22,23}. Notwithstanding this advanced literature; consciousness as Iqbal originally conceived cannot be referred to anything particular. "It is not a thing; it is rather an experience or many different experiences that we label as consciousness. What then is the real problem, and how should it be tackled? (Duch 1995)²⁴." He makes an incisive comment on the understanding of consciousness in the following words:

Some physicists think a unified theory of everything (TOE) will explain consciousness together with everything else, for example, Penrose (1994) writing on consciousness, quantum gravity and unified field theories concedes that consciousness is indeed some thing. It is not clear what they mean. Of course such a belief goes along the respected reductionist tradition However, in case of consciousness this is not and will never be sufficient! The reason is rather subtle and not hard to follow. Understanding depends not only on the ability to draw logical conclusions but also on relation of these conclusions to our experiences. Understanding of classical physics agrees with our sensory experiences. Understanding in quantum mechanics refers to abstract objects, such as the wavefronts, and since these objects are not directly accessible to our senses

the feeling that we really understand is very hard to achieve understanding of the mind in abstract physical terms derived from quantum mechanics or quantum gravity is not satisfactory because we have direct precept of mind while we do not have such perception of quantum wavefunction.

This bold assertion of a computer scientist, pointing in a forceful and logical manner the inadequacy of the sciences to the understanding of consciousness through reduction, throws the field of consciousness (ego) in the lap of psychologists, and philosophers, but more-so, with those who advocate the veracity of inner religious experience based on revealed knowledge (for example Iqbal (1930)²⁵; Eccles (1994)²⁶; Watson (1993)²⁷. Let us now turn to some recent views on the subject and try to explore the requirements for a good theory of consciousness and also find out as to what extent these views support Iqbal's thesis.

John Eccles was a young medical student when he applied himself to Descartes *dualism* because, as he thought, separating *res extensa* and *res cognita* "gave a secure status to human soul or self." He, however, did not fully subscribe to dualist dictum of Descartes, yet he continued to adhere to dualist interaction as Iqbal did between non material self (consciousness, ego) and material brain. But his approach was different. In 1963, he received the Nobel Prize for his pioneering work on 'Action Potentials' and Synaptic (where axons meet the dendrites) neurophysiology (See Chapter- 4). This monumental work is fully explained in his Nobel lecture delivered on December 11, 1963. However, more precise contents of his theory of self-consciousness are available in Popper and Eccles (1977)²⁸, Eccles (1994)²⁹. Popper a well known philosopher of modern times, and Eccles a physicist jointly authored a book entitled: *The Self and Its Brain* (An argument for interactionism. The research was a deft binding of Popper's philosophical insight with the scientific knowledge of Eccles. Popper stated comprehensively that:

I wish to state clearly and unambiguously that I am convinced that selves exist.

Extending this statement he proposes the hypothesis of three worlds: **World one** according to him is the objective world of Schrodinger. This is the universe of physical entities in which the interaction between physical objects is governed by laws of physics and mathematics. It is this world in which a reductionist resides. **The second world** lies beyond the inner self of ideas: pain, joys, sorrows, love, schemes, striving and songs that are jumbled together with memories of the past and hopes and fears of future, The inner reality belongs to this world. **The third world** is the world of human culture. It includes all the products of human mind such as stories, myths, scientific theories, problems, social institutions and works of art. These categories are almost identical to those proposed by Plato and reproduced recently by Penrose (1994)³⁰. Having described this, Popper makes an interesting statement which we quote from Alwyn (1995)³¹:

Careful consideration of world three can illuminate the mind body problem. He presents three arguments to support this view and the first is this: Although world three's objects are abstract, they are also real, for they can change world - 1. But world 3 affects world-1, only through human intervention, because it involves a world-2 process. we therefore have to admit that both world 3 objects and the processes of world 2 are real - even though we may not like this admission, out of deference, say, to the great tradition of materialism.

Further, two points may be noted. First, the world 2 belongs to the "states of soul" as envisaged by Plato. Second, any definition of self must include all the three worlds but intervention of the World 2, either way, has a significant involvement. Yet, what is crucial, and what has still remained elusive so far is the space-time relationship of world 2. Iqbal identifies that this is understandable as it happens in the serial time. Implicitly, Iqbal also identifies the inner experience of the self in world 2 with what lies beyond worlds 2 and 3 which, according to him, happens in Divine time and Divine space. Soon, we will revert to this issue. For Popper, there is nothing mystical about 'self' and he states that "the integrity and identity of the self have a physical basis. This seems to be centered in the brain." It remains to be examined, however,

whether the self as recognized by Iqbal and that identified by Popper are the same? Perhaps not? Popper in support of his argument provides evidence that "flawless transplantation of a brain, were it possible, would amount to transference of the mind, or the self." Perhaps on this point both physicalists and non-physicalists would agree (Scott, 1995)³².

Whereas Popper is in favour of monistic materialism assigning the behavior of mind-self to the brain, Eccles has different views, somehow closer to dualism. His work may be appreciated on two counts. **Firstly**, his contribution to the physics of neurons and synapses, and **secondly** his theory of dualism in which by generalizing intentionalism, he proposed interaction of two distinct entities – the spiritual self (world 2 of Popper) and the material brain (world 1 of Popper). About his physical theory of neuronal activity and the way the message is conveyed from one neuron to the other, he made a breakthrough contribution by showing how at the nerve end where axon branches come in contact with the dendrons or muscle fibres, the gap at the junction is bridged by the release of chemical substances which convey the stimulus from one side of the gap to the other side. For this pioneering work, which is now an accepted physiological principle, Eccles received Nobel Prize in 1963 (those interested in further details are invited to read his Nobel lecture delivered on December 11, 1963). In spite of being an empiricist by training, he became a dualist interactionist, when in 1994 he published his book: "How the Self Controls its Brain." However, his work neither follows nor precedes the philosophic doctrine of dualist-interactionism in the form postulated by Descartes. Nor does his work reflect or support dualism's currently popular alternative material monism. For a better understanding of Eccles dualism, let us examine some of the major features of his theory and then subject it to critical analysis. We must, however, bring to the attention of the reader that by the empirical approach of Eccles one may not be misled that he subscribes in any way to monistic materialism. Indeed, if anything, he rejects it

philosophically. We summarize below the important features of his dualism theory:

- (i) Some electric processes in the cortex are quantum mechanically probabilistic. The substances released at the synapses are delivered in probabilistic quanta;
- (ii) The self (the mind) is a probabilistic field not a material entity in space and time. It acts on the brain through what he calls "self field";
- (iii) Poppers ontology of three worlds is presupposed in the theory;
- (iv) World 2 is the equivalent of self and it interacts with World 1.
- (v) World 2 throws light on the mind-brain problem through the hypothesis that the non-material mental events relate to the neural events of the brain (the world 1 of matter and energy) by actions that are in conformity with the physics of quantum theory;
- (vi) Self does not carry any mass or energy but exerts effective action at micro-cites in the brain;
- (vii) The probabilistic field of self alters the release of chemical substance, released at the synapses in the cortex (interaction of immaterial self with material brain;
- (viii) The self starts the brain's behavior; it controls the brain's behavioral output;
- (ix) Self survives after death;
- (x) Since the self is immortal, the physical conservation laws are not broken. This removes the major obstacle in the way of dualism;
- (xi) All mental states and experiences, in fact the whole of the sensory inner and outer experiences are composite of elemental or unitary mental experiences at all levels of intensity and each of these mental units is linked in some unitary manner to a dendron. The proposed mental units have been named psychons. *Psychons are experiences in all their diversity and uniqueness. It is the property of psychons to link together in providing a unified experience (1994). This constitutes the binding hypothesis within the framework of the theory.*

Since the time when the *Reconstruction* was written, a voluminous literature has appeared on two opposing philosophies of monistic materialism and dualism. In each case, consciousness has occupied the central stage in the minds of researchers. As we study the history of thought in philosophy and science we find only Eccles work, who, being a physicist and therefore an empiricist, has thrown his full weight in support of dualism (the approach, of course, being somewhat different from that of Descartes). Now comparing the work of Eccles prepared in the company of a philosopher of Popper's fame, we find abundant similarities between Eccles and Iqbal on the subject of self, ego and consciousness. We have chosen to bring out the comparisons, and also the contrast, if any, between the two in order to visualize what aspects in the two can be retained for developing a unified theory of consciousness, ego and self (Table - 1). It may be noted, however, that whereas Eccles fully subscribes to the three worlds proposed by Popper, Iqbal does not clearly bring out this distinction, though by implication, his several views spelled out throughout the *Reconstruction* lead to the same vision as that of Popper (1974). Additionally, Iqbal recognizes a fourth world, beyond perceptive boundaries of Worlds -1 and 3 of Popper. The world 2 of Popper is almost identical with that of Iqbal. This world 2 being reminiscent of Plato's "states of the soul."

Table 1: Comparison of Eccles' (1974, 1995) and Iqbal's (1930) approaches to dualism.

	Theoretical Framework	Eccles	Iqbal
1.	Three Worlds of Popper	Yes	Yes, but only by implication. Also, recognizing the fourth world beyond the three worlds.
2.	World 2 of Popper (soul, self, ego and consciousness)	Yes	Yes

3.	World 2 (soul etc.) important for interaction of Worlds 1 and 3.	Yes	Yes. But also interaction of World 2 with World 4.
4.	Electrical Process in the brain; substances released at synapses; both are probabilistic (quantum physics)	Yes.	No indication.
5.	The self is a field not a material unity in space and time. It acts on the brain	Yes	Yes, but not that self is a field and acts probabilistically.
6.	Self does not have mass and energy but exerts actions on the brain.	Yes	Yes, but Iqbal proposes it as a Directive force (Amr.)
7.	The probabilistic field of the self alters the release of chemicals at synapses quantum mechanistically.	Yes	No
8.	Self controls brain's behavioral output.	Yes	Yes
9.	Self is immortal (Quantum laws not applicable, possible survival after death.	Yes	Yes
10.	Mental units are composite of various mental experiences.	Yes	Yes
11.	Theoretically proposed mental elements are psychons which unify all experiences (binding).	Yes	Not in this form.

Note: Being an empiricist, which Iqbal was not, Eccles use of the properties of self as a field which acts on the brain, and psychons as binding forces is to relate the non-material state with quantum physics. This is an attempt to remove the objection of modern physicists.

The study of the contents of Table 1, will reveal that, on the basics, there are no differences in Iqbal's conceptual framework, and that of Eccles on self, ego and consciousness. Both agree that self (ego) is immortal. Both agree that self (ego) survives death. Both agree with World 2. Both agree that self controls the brain. Both agree that self has no mass or energy, since it is not a substance in time and space. Where then lie the differences? The **first** difference which may be noted lies in the fact that Eccles was a physicist and being so he had to satisfy the physicalists and thus had to evoke the quantum physics approach to the properties of self. This is why he used the word "self-field" which acts probabilistically on the brain. Same is true of the chemicals released at nerve endings, which, in turn, depend upon the strength of the stimulus under the sway of "self-field". As a product of the action of the self-field *psychons* have also been proposed to suggest a novel, though hypothetical, mechanism of binding for all experiences, past and present, into a unitary response. On the other hand Iqbal was a philosopher of unmatched understanding of Islamic thought and had only limited access to the new physics which was in the process of making at that time and, more so, the structure and function of the brain. Even then, it is amazing to note the elegance with which he used physical engineering to construct the theory of self; drawing inspiration at the same time from the revealed knowledge in the Qur'an. Eccles theory of the self coming out as late as 1995 after Iqbal's *Reconstruction* (1930) is simply an advancement of Iqbal's own masterly treatment of the subject. One may wonder at the similarities between the approaches of Eccles and Iqbal! Some may attribute it intellectual compatibilities. Yet, the answer may lie in the simple fact that Eccles was a devoted Christian and Iqbal was a devoted Muslim. Both had complete faith in the spiritual aspects of life ordained by God. However, Iqbal presents a more logical thought on association of metaphysics of the Directive force (Amr) with ego (self, consciousness) which we have already discussed.

Notwithstanding the ingenuity of Iqbal and Eccles, as described above, there are a number of alternate proposals (both positive and negative) which bring into discussion several aspects of consciousness which are beyond the scope of this book. However, some amazingly attractive views published recently have a merit to be discussed here. For example, Watson and Williams (2003) have written an excellent critique on Eccles's Model of the Self Controlling its Brain. The critique is based on Watson's own theory of Enformy (1993, 1997)^{33,34} which he named as "The Theory of Enformed Systems (TES)". (Watson 1997, Watson *et. al.*; 1998; Schwartz; *et. al.*, 1998)^{35,36,37}. The conceptual origin of TES is that "there exists a fundamental conserved capacity to *Organize*, denoted by his term enformy. This may be compared with Law of entropy. In this way disorganization is opposed when enformy organizes and sustains four dimensional fields of randomness (this is called enformation). The fields and domains are called SELF, sustained by enforming and capable of reproducing and evolving.

This SELF apparently corresponds to the "Self" described by Eccles. In simple words "self" of Watson (1993) simply means linking by memory of conscious states which are experienced at various times during the lifetime.

It is presupposed in the continuity of mental states, particularly the continuity bridging the gaps of unconsciousness. For example, the continuity of our self is resumed after sleep, and after temporary amnesia (loss of memory) during concussion and convulsion. Furthermore, the "SELFS" are not limited to humans. They correspond to the organization inherent in all coherent systems, ranging from photons to humans and beyond. Because they are continuous in space-time, but discontinuous in three dimensional spaces, their fundamental behaviors account for the non-local phenomena observed in parapsychology, for instance, telepathy (Watson, 2003)³⁸.

This brings out three features of the self: (1) organizing its own state at a given time; (2) organizing various states of selves, and (3) organizing past

and present in space-time. The last named attribute accounts for telepathy, remote viewing, precognition and psychokinesis.

Now let us find out how Watson (2003)³⁹ uses TES for testing the validity of Eccles model. **First**, as mentioned above, in principle the 'self-field' of Eccles seems identical to "SELF" of Watson, because like the former it organizes elements of matter and energy-mass (in this case brain) to submit to and conform to the organization (enformy) of the SELF. SELF is thus a guiding map (what Eccles calls fields) for physical systems in time and space, which is the basis of origin of life (remember life originated by enformy (organization) of organic molecules which according to Iqbal is part of the *élan vital* in perpetuation). **Second**, Watson turns to the "self field" of Eccles by stating that organization of SELF (enformy) can be modified, augmented or effaced. They contain the memory that provides the continuity of mental experience as conceived by Eccles. Thus, brain is not necessary for memory content— "this is why searching for it in the brain has proven futile (Schechter, 1996)⁴⁰". Like Eccles, Watson reaches the same conclusion that SELF, in the TES, replaces "self-field" of Eccles thus solving time old mind-brain problem. Watson (1993, 1996)^{41,42} on the basis of these arguments concludes that "under TES, neither mind nor body is a primary topic of interest, yet the theory inheres a comprehensive stratagem for consciousness. That is, by explaining the organization of all holistic systems— including their fundamental properties and behavior— TES explains all the elements attributed to "mind" and "body", and life itself, quantum physically, and parapsychologically. It therefore satisfies both the binding problem and the mind body problem (Watson, 1973, 1997 b)⁴³.

Eccles also made a brilliant theoretical contribution when he postulated the theory of psychon fields. It appears to us that the updated theory of Watson described above falls in line with the concept of Eccles. It also receives support from other sources as well. For example, Sheldrake's study of morphic fields (which applies to biological systems in general) including mentality, is defined by him in the following words:

A field within and around a morphic unit which recognizes its pattern of structure and activity; morphic fields are shaped and stabilized by 'morphic resonance' from previous similarly morphic units, which were under the influence of fields of the same kind. They consequently contain a kind of cumulative memory and tend to become increasingly habitual.

This description of biological 'morphic fields' can exactly be superimposed on psychon fields. In the same way Eccles' psychon theory appears to be a special case of the Egon theory of Christy and Jones (1998)⁴⁴, who apply their concept of egons not only to biological and psychological phenomena but to non-living systems as well. It is interesting, and a lot more difficult for physicalists to understand and accept that Egon theory which regards "all of the identities in nature as minds and their properties as communication of those minds." Thus, we can confront a physicalist (reductionist) that "Physics can be understood intuitively as a hierarchy of consciousness, and that nature consists of nothing but conscious experience". (Christy and Jones, 1998)⁴⁵.

In summary then, all what has been described above brings Iqbal's viewpoint on higher consciousness, ego and inner religious experience closer to the fringes of science, as if waiting for its fuller realization through experimental verification. Sherdrake suggests that "consistent with Platonic theory of creativity, all possible morphic fields exist timelessly, awaiting their expression in physical systems." This is what Iqbal calls Amr Rabbi (Directive force). However, we have yet to establish the process of conservation of these fields. Not surprisingly, as of today we do not find such a phenomenon of conservation, for example, in the electromagnetic fields (Watson 2003)⁴⁶.

Now, physical approach to consciousness appears in several guises. There are a number of new studies ranging from one extreme to the other. Important among them include Baars (1993)⁴⁷; Chalmers (1995)⁴⁸; Crick (1994 a,b)^{49,50}; Dennet (1992)⁵¹; Eccles (1992)⁵²; Harth (1993, 1995)^{53,54}; Hebb (1942, 1980)^{55,56}; Penrose (1994 a,b, 1989)^{57,58,59}; Searle (1992)⁶⁰; Strapp (1993), Watson (1924). The reader may refer

to these works for further extending his information. However, a few of these studies are of significance for our discussion on physicalism and dualism. If recent intellectual history is any guide then, as is claimed, materialism remains the only rational way to approach the study of mind. John Searle remarks:

Modern materialism appears in a variety of guises ranging from the claim that mental states do not exist (eliminative materialism), to the view that a computer that successfully mimics human behavior must have thoughts, feelings and understanding (computer functionalism).

For Searle, this attitude is implausible. In spite of this he takes a position with physicalists when he concludes that *"the existence of consciousness can be explained by the causal interaction between elements of the brain at the micro level, but consciousness itself cannot be deduced or calculated from the sheer physical structure of the neurons without some additional account of causal relations between them."* This in our opinion is another form of reductionism with several logical inadequacies inherent in the statement. On the subject of consciousness some bold assertions have been made by Penrose (1989, 1994a, 1994b) in his best selling books; *"The Empors New Mind"* and *"Shadows of the Mind"*. Penrose himself a reductionist, confronts the physicalists with a number of interesting and logically valid ideas. **First**, without attempting any definition of consciousness, he rejects the physicalists belief that *"everything (including consciousness) is a digital computer."* **Second**, he presents powerful arguments to reject the claim made by functionalists in the artificial intelligence community that what the brain does can be reduced to an algorithm and duplicated 'in principle', on a digital computer. For him the activity of brain is non-linear and therefore only non-linear mathematics has to be applied in order to conform to the putative methods of physics and mathematics. This is why he asks the questions: (a) can computer have a mind (from the examples of chess games he has given – the answer emerges – 'No'), and (b) where lies the physics of mind? (the answer is that physics and mathematics of mind have yet to be

discovered). **Third**, philosophically, any mathematical idea perceived makes contact with Plato's world, the world 3 of Popper. For example, *"when one sees mathematical truth, his consciousness breaks through in the world of ideas, and makes direct contact with it (accessible via intellect)"*. *"This be so, it must be noted that man has not created mathematics, he has only discovered it. The significance of this important statement will be discussed in a subsequent chapter. Fourth*, considering awareness as a preliminary to consciousness, *"awareness can be evoked by physical action of the brain, but this physical action cannot even be properly simulated computationally"*. The major conclusions he then draws from his ideas include: (a) since the physical activity of the brain cannot be simulated on a computer, therefore, the extent of physical laws may lie outside the purview of physical organization of the brain, and (b) the non-computable physics, according to him, (starting with the single cell paramoccium, who uses his cilia for getting awareness of surrounding obstacles) can be found in the micro-tubular structure of paramoccium. He concludes his arguments in the following words:

Let us then accept the possibility that the totality of microtubules in the cytoskeleton of a large family of the neurons in our brain may well take part in the global quantum coherence – or at least that there is a sufficient quantum entanglement between the states of different microtubules across the brain – so that an overall classical description of the collective actions of these microtubules is not appropriate.

Whereas, the validity of this hypothesis has yet to be established to any reasonable extent, a student of biology, however, sees some merit in it. The merit lies in the fact that emergence of consciousness, reaching its climax in the human species, can be explained on the basis of a widely accepted view that the process of organic evolution has gone through a four-dimensional time frame. Furthermore, it is unlikely that physical actions like the one proposed by Penrose in the microtubules cannot be simulated. There is little doubt that

so far we have not touched even the threshold of this reductionist approach.

In his interesting book: 'The Creative Loop' (Harth, 1993) presents an attractive analysis of consciousness, starting with the incisive remarks that "being familiar with the quantum theory, which denies predictability at the atomic level, and the theory of relativity, which mixes the concepts of time and space, physicists need not be overly impressed with philosophical conclusions that are based on scientific perspectives of nineteenth century". After identifying several characteristics of consciousness (selectivity, exclusivity, chaining and unitarity), he presents a theory essentially based on Hebb's concept of cell assemblies (previously discussed), through which he constructs the loop of consciousness, starting with afferent sensation (e.g. light) through nerve cell assemblies. Interestingly enough, for him (Harth, 1993), dualism is not quite as dead as some would have us believe. He, like Penrose dismisses the idea of physicalists that "even a most powerful computer cannot think, but perform a prescribed computational task in the service of client." Another physicist - Henry Stapp - in his book: *Work, Mind, Matter and Quantum Mechanics* (1993) came up with an intriguing set of arguments. He thinks, that it is a wild goose chase to find answer to consciousness in classical Newtonian dynamics, since "Nothing in classical physics can create something that is essentially more than an aggregation of its parts. For this reason he turns to Heisenberg's formulation of quantum mechanics for an explanation of the properties of consciousness (see the chapter on the World of Physics). Without quantum mechanics he states the evolution of the physical units would be exactly the same whether subjective conscious experience exists or not." The process of evolution *per se* is generated by quantum mechanics, because of choosing one possibility from the other (Natural Selection). "This is attributed to the wavefunction for the universe in the perspective of Heisenberg's principle or in conformity with Schrodinger's deterministic equation. Both appear to control

the universe. He seems to agree with Eccles' probabilistic solution according to Quantum Mechanists in fields of neuronal-axonal-synaptic complex. The wave function can collapse at any of these stages.

We have been repeatedly referring to the relationship between consciousness and quantum theory. We have noticed that the theory in the hands of physicalists as well as dualists has taken different interpretations. One such interpretation, which is of interest to us, and which is likely to be of some significance when we make an attempt to up-date Iqbal's views on consciousness, ego and self, has been put up recently by Pratt (1977) in his article: 'Consciousness, Causality and Quantum Physics'. As we have explained in an earlier chapter, the standard interpretation of quantum physics assumes (a) indetermination; (b) quantum systems exist objectively only when they are being measured or observed; (c) the claim that mathematical description of the quantum world allows the probabilistic or experimental results to be calculated with high degree of accuracy, yet there is no consensus as to what it means in conceptual terms. Thus, according to the "uncertainty principle the position and momentum of a subatomic particle cannot be measured simultaneously with accuracy greater than that of Planck's constant", (d) the particle can never be at rest, but is subject to constant fluctuations even when no measurement is taking place, and that

these fluctuations are assumed to have no causes at all.

In conclusion, it follows from (a) - (d) that quantum world is believed to be characterized by "absolute indeterminism, intrinsic ambiguity, and irreducible lawlessness.

Taking exception to this classical view of quantum physics (Bohm and Hiley, 1993; Bohm and Peat 1989), have expressed the view that abandonment of causality had been too hasty: "It is quite possible that while the quantum theory, and with it indeterminacy principle, are valid to a very high degree of approximation in a certain domain, they both cease to

have relevance in new domain's below that in which the current theory is applicable.

In our opinion, this is a highly intriguing statement which plunges us from science straight into metaphysics. This means nothing but an ontological interpretation of quantum theory, rejecting the two major assumptions of the theory, namely, absolute indeterminism and objective existence of quantum systems only when they are measurable and observable. Does this mean, as Bohm (*op. cit.*) suggests "that the quantum events are partly determined by subtler forces (presently unknown) operating at deeper levels of reality? We believe that this concept of Bohm brings him closer to the concepts of Eccles (synaptic fields) and that of Iqbal (Directive Forces). This will be taken up again in the next chapter.

Physicalists tell us that a quantum system is represented mathematically by a wavefunction which is derived from Schrodinger's equation. The wavefunction can be used to calculate the probability of finding a particle at any particular point in space. However, if wavefunction is assumed to provide a complete picture of quantum system, then this would mean that between the measurements the particle dissolves into nothingness of quantum world, and is probably present in different places at once. It has been agreed that wavefunction collapses in a mysterious way—violating the Schrodinger equation. This has no explanation in the classical quantum theory at the micro-level; though, it operates precisely at the macro-level. We have brought this concept into discussion for the reason that theorists claim that "collapse of wavefunction (in the brain) is caused by consciousness thereby creating reality." The theory also emphasizes that "only self conscious beings such as ourselves can collapse wavefunction". In view of the above, it should be legitimate to assume that "the whole universe must have existed as 'potentia' in some transcendental realm (Directive Force) of quantum possibilities until self conscious being evolved and collapsed themselves and the rest of the branch

of their reality into material world and the objects remain in a state of actuality only so long as they are being observed by humans" (Goswami, 1993) The other view that even non self-conscious organisms or even electrons can cause wavefunction collapse has also been put forward (Herbert, 1993). Whatever may be the case, the fact remains that the idea of wave packets spreading out and collapsing is not based on hard experimental evidence. This is why we are inclined to go along with Bohm's ontological interpretation that wavefunction gives only ill-defined and unsatisfactory notion of wavefunction collapse. Alternately, he suggests the real existence of particles and fields:

Particles have a complete inner structure and are always accompanied by a quantum wave field; they are acted upon not only by classical electromagnetic but also by a subtle force, the quantum potential determined by quantum field (Bohm and Hiley 1993, Bohm and Peat, 1989; Hiley and Peat, 1991) See also Eccles (op. cit.)

We cannot go into a detailed entanglement of Bohm's arguments, however, suffice to state that particles are guided by quantum potential and provide connection between quantum systems. This represents a vast energy pool, recognized by standard quantum vacuum, underlying the material world. Very little is known about quantum vacuum (zero potential field) but its energy density is astronomical (10^{108} J/Com³). On this basis he postulates that:

It is quite possible that while the quantum theory, and with it the indeterminate principle, are valid to a very large degree of approximation in a certain domain, they both cease to have relevance in new domains below the ones in which current theory is applicable.

It is interesting to note as stated by him that observation is not a necessary test for proving the existence of quantum world when it lies beyond its measurable domain, i.e., below the recognized quantum world. He, therefore, rejects the positivist view that "something that cannot be measured or known precisely cannot be said to exist". In other words, he does not confuse epistemology with ontology.

We now close this chapter and will make an attempt to analyze these ideas further, whether coming from physicalists or

dualists when we will make an attempt to formulate a unified theory of consciousness in the next two chapters. However, in the meanwhile in agreement with Iqbal we cannot but repeat the following quote from Karl Popper:

"I wish to state clearly and unambiguously that I am convinced that selves exist".

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CHAPTER – VI

A UNIFIED THEORY OF CONSCIOUSNESS-I (Prelude)

In earlier chapters we have tried to put together Iqbal's thoughts on inner religious experience, spread over several chapters of the *Reconstruction*. We have also tried to articulate some basic information on Newtonian physics and Quantum mechanics (Heisenberg's theory of wave front). In addition, we have spent considerable time in enriching our concepts about the nature of matter and universe. Our chapter on the "Biophysics of Consciousness" was meant to develop a foothold on structure and function of the brain as understood by modern students of neurophysiology. The two chapters on "The Mystique of Consciousness" summarized various views (classical as well as modern) of physiologists, philosophers and psychologists to the extent permitted by the scope of this book, that is, the study of Iqbal's motif of inner religious experience viewed in the light of expanding frontiers of knowledge. This was considered necessary so that we could extract a single schema, which could provide the concrete mind with a logical and scientific basis for bridging the gap between revealed knowledge and science. Nowhere else is the gap more evident as it is in the dichotomy of experiences: normal and religious. This, we will take up presently. However, our strategy would be (a) to recount

some additional critical issues raised by physicalists, and dualists and (b) to review the recent literature on mysticism, elaborating at the same time the contributions of some well known Muslim Mystiques, and then proceed to undertake the hard task of formulating a unified theory of consciousness, ego and self in the next chapter.

Now, before we proceed in this direction, we would like to disengage ourselves from the ambiguity of various terms such as ego, self, consciousness, mind, cognitive systems, mental state, psyche and soul. We do not want to say that all these terms mean the same thing. Indeed, the exact meaning of some of them is not very clear. However, to simplify our task, we will take these to have enough overlap, and thus use the word consciousness which now dominates the recent literature on the subject. In fact, in our opinion, Iqbal's use of the word ego and self fully satisfies the characteristics of consciousness. For this reason, in all the previous chapters wherever the word ego appears, the word consciousness has been placed in parenthesis or vice-versa. We were led to this conclusion, when Iqbal explicitly stated that the path towards understanding of ego passes through consciousness.¹

Inasmuch as consciousness is concerned, there is little doubt that we are standing on the crossroad of materialism and dualism. The difficulty lies in the fact that none of these creeds provides us with a full appreciation of the exact nature of consciousness. Whatever has been discussed so far, makes it clear that most of the ideas presented lie at the intersection of science and philosophy. The path carved by science leads to the thicket of brain, where most neurobiologists admit that they do not yet know how and where consciousness arises. The other path winds through philosophy which has been nurtured by ancient as well as modern ideas. The question we are going to raise is that: Do the two tortuous paths have a meeting point? It was the hope of Iqbal that "*the day is not far off when religion and science may discover hitherto unsuspected mutual harmonies*".² As the knowledge stands today and the way its frontiers are expanding, it appears almost a certainty that the

dream of Iqbal will be realized in the coming decades, though in the present state of our knowledge only a few indications point in this direction. We will amplify these indications and leave it to the reader to draw his own conclusions. For this purpose, as Scott (2000)³ remarks, "we must construct consciousness from the relevant physics and biochemistry and electro-physiology and neural assemblies and cultural configuration of mental states that science cannot yet explain." To this may be added the metaphysical construct leavened with faith embedded in the edicts of the revealed knowledge.

Iqbal was right when he remarked, "classical physics (Newtonian) has learned to criticize its own foundations. As a result of this criticism the kind of materialism, which it originally necessitated, is rapidly disappearing."⁴ Some physicalists do agree with this viewpoint. Yet, the enthusiasm which quantum physics generated with its probabilistic occurrence of conscious events, turned the physicalists into reductionists, who believed that everything including consciousness can be explained through the laws of physics. This does not seem to be the whole truth, since more recently a number of physicalists have started challenging the reductionist approach. We will cite a few examples.

Walter Elasser, a theoretical physicist (1966)⁵ following Niels Bohr (1933)⁶ developed ideas about biology. He wondered at the "**immense number of possible structures at each level of biological hierarchy which far exceed the number of organisms that actually exist.**" It was, therefore, difficult to develop biological laws by averaging over identical individuals. Organisms were said to be radically inhomogeneous, because, "**they contain structure within structure within structure, at any level from grossly macroscopic to molecular one.**" This suggests that different configurations in very small dimensions may eventually, in time, transform (evolve) into macroscopic configurations. Such a process which runs through the whole fabric of biology cannot be validated

through the presently known laws of physics. It is perhaps because of this reason that Erich Harth (1995)⁷ comes out with a severe criticism of physicalists in the following words:

"To say that all of human affairs are describable and explainable in strictly physical terms, is sheer nonsense. It is equally nonsensical to assert that introducing such elements as political philosophies or laws, or a climate of opinion, means resorting to some kind of mysticism. We cannot expunge such concepts from a discussion of social dynamics. It must be apparent to all but the most simple minded reductionist that the attempt to construct a true physical theory of society would be a foolish undertaking"

Philip Anderson (1972)⁸, a condensed matter physicist, expressed similar views. He argued that: *"the reductionist hypothesis does not by any means imply a 'constructionist' one. The ability to reduce everything to simple fundamental laws does not imply the ability to start from those laws and reconstruct the universe. In fact, the more the particle physicists tell us about the nature of fundamental laws, the less relevance they seem to have to the very real problems of the rest of science, much less to those of society. The constructionist hypothesis breaks down when confronted with the twin difficulties of scale and complexity."*

In the same vein the Nobel laureate Murray Gell-Mann, in his book: *The Quark and the Jaguar* (1994)⁹ remarks that *"the concept of theory of everything is a misleading characterization unless 'everything' is taken to mean only the description of the elementary particles and their interactions. The theory cannot, by itself, tell us all that is knowable about the universe and the matter it contains, other kinds of information are needed as well."*

Some of the criticism we have cited in the preceding paragraphs on the fixity of reductionist approach about the physical basis of consciousness gives us a clue that their understanding is flawed, if not completely wrong. So much so that even our acceptance of the physics of matter is beset with a number of caveats. **First**, at the time when Iqbal was formulating his thoughts on the *Reconstruction*, the only fundamental particles known at that time were electrons,

protons and neutrons, of which the atoms are made of. However, it is now known that neutrons and protons are constructed through the bricks of most elementary particles named Quarks (Gell-Mann, 1994)¹⁰. For detailed information on this subject, reference may be made to chapter-3. Given the fact that quarks are the most elementary particles, it is not difficult to draw the conclusion that all physical objects, living or non-living, including man are made from Quarks. This raises the question: (a) where do the quarks come from, (b) what was the state of matter before the big bang, which, through the condensation of matter, existing prior to big bang, resulted in the emergence of the universe and (c) as we have shown earlier, the universe is under constant expansion (now experimentally verified), which means that there is a continuous showering of quarks from within or without the universe. On this count, philosopher Barry Dainton has made an interesting observation which is reproduced below from his book: *Stream of Consciousness* (2000)¹¹:

The idea that physical space is itself the product of interaction among pre-spatial particulars is one that physicists have been toying with. Although the spatial dimensions we are familiar with are commonly supposed to have originated with the big bang. If the physical has the pre-spatial ingredients, this could easily have predated the big bang, and perhaps explain why it occurred at all. Suppose these same pre-spatial ingredients are responsible for the generation of consciousness, a proposal which cannot be rejected out of hand, given the non-spatial characteristics of at least some sort of experience. This supposition leads to the striking conclusion that consciousness turns out to be older than matter in space, at least as to its raw materials.

This statement may be analyzed in the context of Iqbal's vision of the "Directive Force (Amr)" which, according to him, has been operating prior to the incident of big bang and continues to perpetuate subsequent to the emergence of the universe. Of further interest to us is the identification by Iqbal of Divine time and Divine space in which the mystic lands himself in periods of mystic experience. Unfortunately, neither the mathematics nor the physics of today are yet able to provide a satisfactory answer for the kind of time-space

order that prevailed prior to the big bang. Is it not true as Iqbal implicitly conceives, that mathematics and physics have not been invented by man, they only discovered them? In fact, laws of physics accompanied the emergence of the universe when condensation of matter was taking place. How? We have no answer, except that we have to turn to the "Directive Force", as insisted by Iqbal.

More explicit statement on this subject is that of Swanson (1994)¹², who proposed the idea of *agnostic materialism*. The same is reproduced below:

The idea that mind-body problem is particularly perplexing flows from the unjustified and relatively modern faith that we have an adequate grasp of the fundamental nature of mater at some crucial general level of understanding, even if we are uncertain about many details. Agnosticism is called for because it seems so clear that this cannot be right if materialism is true. (1994: 105).

Equally important are the views of another philosopher, McGinn (1991)¹³, who in his book: "Consciousness and Space": presents the following remarks:

That the brain must have properties other than those currently recognized, since these are insufficient to explain what it can achieve, namely the generation of consciousness. The brain must have aspects that are not represented in our current physical world view, aspects we do not understand, in addition to all those neurons and electrochemical processes. There is, on this view, a radical incompleteness in our view of reality including physical reality." (1995: 157).

On the basis of this valid criticism on the reductionist position by eminent scholars of the same profession, we can make a statement that there is incompleteness in the physicalists view regarding consciousness which they leave entirely to the neuronal activity of the brain.

Using another line of thought developed by Barry Dainton (2000)¹⁴ we can arrive at the same conclusion, though in a somewhat modified form. The philosopher approaches the problem by taking into account the philosophy of phenomenalism initiated by Hussrel (1900)¹⁵. In doing so, his analysis takes note of: (a) phenomenalsim per se; (b) experience; (c) understanding; (d) awareness; (e) unity of

consciousness; (f) phenomenal space; and phenomenal time. All these aspects have been discussed in the perspectives of consciousness. The same are also addressed in relation to physicalism as well as dualism, however, without committing himself completely to any one of these creeds. Though he does not subscribe to the Cartesian type of substance dualism, yet maintaining that the only merit of dualism in any form lies in the fact that it implies unity of consciousness (see also Iqbal on unity of consciousness). This constitutes a substantial part of his thesis designated as phenomenal consciousness, in which he sees its ultra organic "relationship with experience." By experience he means "states or items with a phenomenal character." To be able to build his arguments, he, like Iqbal, draws distinction between "experience of understanding and perceptual experience." The former in the words of Iqbal means inner religious experience, even if generalized, it amounts to introspection; the other, however, is the same which Iqbal calls normal experience (verifiable, sensible). What is phenomenalism, however? A brief analysis of this philosophy will be in order for the reason that it may give us some clue as to whether science and philosophy do really have a meeting ground as predicted by Iqbal. In the process of developing an understanding of phenomenalism, we will also make reference to the related issues, for example, experience, thought, awareness and understanding.

The discipline of phenomenology may be defined initially as the study of structures of experience (emphasis: experience) or consciousness. More exactly, it is the study of phenomena; that is, appearances of things, or things as they appear in our experience and the meanings we draw from it. Accordingly, phenomenology studies – "conscious experience" – as experienced from the first hand point of view (subjective). This field of philosophy has its own firm footing among other philosophical thoughts. Not surprisingly, it can be distinguished, or related to, other main fields of philosophy, namely, ontology (the study of being);

epistemology (the study of knowledge), logic (the study of valid reasoning) and ethics (the study of moral values), among others. Since Edmund Husserl's logical investigations (1900)¹⁶, this philosophy has been extensively debated in the 20th century and the debate continues unabated. (see, for example: Martin Heidegger)¹⁷. In order to pursue phenomenology in terms of experience or consciousness, we have to have our focus on: (a) pure description of lived experience, (Husserl, 1991)¹⁸, (b) interpretation of type of experience in relation with the contextual features, especially social and linguistic (Hermeneutics: Heidegger¹⁹ and others) and (c) the form and type of the experience. We have no intention of going into details of philosophy of phenomenology but will make an attempt to draw from it only to the extent that as to how it interprets experience (categorizes)?; (b) how, if at all, it bridges the gap between science and philosophy? (c) how this can be related to religious experience Introspectively? (d) how is unity of consciousness embedded in this philosophy? and (e) what is meant by phenomenological space and time? Answers to these questions may help us in constructing a unified theory of consciousness *sans* pure physicalism (reductionism).

We strongly emphasize that what makes an experience conscious is certain awareness one has of the experience while living through or performing it. As has been referred to earlier, Dainton distinguishes perceptual experience (sensible), from experience of understanding (non-sensible). Whatever the case may be, the introspection or inner awareness has been a subject of considerable debate in spite of Locke's (1897)²⁰ notion of self consciousness on the heels of Descartes' sense of consciousness. It does not mean as Bernato²¹ argued that awareness of experience is a kind of inner observation, as if one were doing two things at a time. In our opinion we consider such an experience as what Iqbal calls higher order perception of one's mind in operation, or, put in other words it is a higher order thought about one's mental activity (note how phenomenology comes out in

support of Iqbal's views on consciousness). All this means that awareness, experience and consciousness should be placed within a single parenthesis, and further that it not only explains the unity of consciousness emerging from stream of consciousness, but is also an individuated subjective phenomenon— beset with intentionality. For a detailed discussion on the origin and development of phenomenology reference may be made to some interesting nineteenth-twentieth century works, such as: William James's *Principles of Psychology*; Heidegger's *Being and Time* (1927)²¹ among others. From what we have been presenting on phenomenology, though briefly, we come to the conclusion that Rene Descartes in his epoch making "Meditation on First Philosophy" (1641) had argued that minds and bodies are two distinct kinds of being or substances with two different kinds of attributes or modes: bodies are characterized by spatio-temporal physical properties, while minds are characterized by properties of thinking (including introspection in the absence of stimuli from external physical objects). Centuries later, phenomenology would find, in the works of Bernato and Husserl that mental acts are characterized by consciousness and intentionality, while natural sciences would find that physical systems are characterized by mass and force, ultimately by gravitational, electromagnetic, and quantum fields. Where do we find intentionality and consciousness in quantum electromagnetic-gravitational fields remains an enigma for the physical order of this world. That is the mind-body problem today.

We have drawn the attention of the reader to the philosophy of phenomenology for the precise reason that by whatever name it may be called, it lies at the heart of mind-body problem. We close the discussion on phenomenology by referring to the works of Nagel (1970)²² and Searle (1983, 1991)²³. Nagel argued that "Many philosophers pressed the case that many qualia (pain, color cognition) are not addressed by a physical account of either brain structure or brain function. Consciousness has properties of its own. And

yet, we know, it is closely tied to the brain. And, at some level of description, neural activities implement computation (cf. Dennet and Eccles: as discussed in the previous chapter). In the same vein Searle argues in his book: *The Rediscovery of the Mind* (1991) and *Intentionality* (1983) in the following words:

Consciousness and intentionality are essential properties of the mental states. Our brains produce mental states with properties of consciousness and intentionality, and this is all part of our biology, yet consciousness and intentionality require 'first person' ontology. Computers simulate but do not have mental states characterized by intentionality (computers process symbols and symbols lack meaning, that is, no "semantics"). Thus Searle categorically rejects materialism and functionalism, while insisting that "mind is a biological property of organism like us: our brains secrete consciousness.

In essence then, phenomenology provides a kind of umbrella on biological, physical and social processes associated with consciousness and thus can be considered as a good candidate, though partially, for constructing a unified theory of consciousness, provided that we can neatly integrate it with Dennet's hypothesis of neural assemblies, Eccles' theory of Action Potentials including probabilistic traffic of afferent and efferent messages along the synaptic zones, world 2 of Popper related to soul or consciousness, and finally, Iqbal's interpretation of Directive Force (Amr Rabbi). Most interesting part of this philosophy is the identification of phenomenal space and phenomenal time as having their existence independent of serial time and space, with characteristics to be discussed later.

We have been repeatedly referring to the relationship between consciousness and quantum theory. We have noticed that the theory in the hands of physicalists as well as dualists has taken different interpretations. One such interpretation, which is of interest to us, and which is likely to have great significance when we make an attempt to up-date Iqbal's views on consciousness, ego and self, has been put up recently by Pratt (1977)²⁴ in his article: *Consciousness, Causality and Quantum Physics*. As we have explained earlier, the standard interpretation of quantum physics assumes (a) indetermination, (b) quantum

systems exist, objectively only when they are being measured or observed; (c) whereas mathematical description of the quantum world allows the probability of experimental results to be calculated with high degree of accuracy, there is no consensus what it means in conceptual terms. Thus, according to the uncertainty principle "the position and momentum of a subatomic particle cannot be measured simultaneously with accuracy greater than that of Plank's constant", (d) the particle can never be at rest, but is subject to constant fluctuations even when no measurement is taking place, and that "these fluctuations are assumed to have no causes at all". In conclusion, it follows from (a) - (d) that quantum world is believed to be characterized by absolute indeterminism, intrinsic ambiguity, and irreducible lawlessness.

Taking exception to this classical view of quantum physics Bohm (1993)²⁵ and Bohm and Peat (1989)²⁶, expressed the view that abandonment of causality had been too hasty: "It is quite possible that while the quantum theory, and with it indeterminacy principle, are valid to a very high degree of approximation in a certain domain, they both cease to have relevance in new domains below that in which the current theory is applicable." In our opinion, this is a highly intriguing statement which plunges us from science straight into metaphysics. This means nothing but an ontological interpretation of quantum theory, rejecting the two major assumptions of the theory, namely, absolute indeterminism and objective existence of quantum systems only when they are measurable and observable. Does this mean, as Bohm (*op. cit.*) suggests "that the quantum events are partly determined by subtler forces (presently unknown) operating at levels deeper than the known physical reality? We believe that this concept of Bohm brings him closer to the concepts of Eccles (synaptic fields) and that of Iqbal (Directive Force). This will be taken up again in the next chapter.

Physicalists tell us that a quantum system is represented mathematically by a wavefunction which is derived from Schrodinger's equation. The wavefunction can be used to

calculate the probability of finding a particle at any particular point in space. However, if wavefunction is assumed to provide a complete picture of quantum system, then this would mean that between measurements the particle dissolves into nothingness, and is probably present in different places at once. It has been agreed that wavefunction collapses in a mysterious way – violating the Schrodinger equation. This has no explanation in the classical quantum theory at the micro-level; though, it operates precisely at the macro-level. We have brought this concept into discussion for the reason that theorists claim that “collapse of wave function is caused by consciousness thereby creating reality.” The theory also emphasizes that “only self conscious being such as ourselves can collapse wave function. In view of the above, it should be legitimate to assume that “the whole universe must have existed as ‘potentia’ in some transcendental realm (Directive Force) of quantum probabilities until self conscious beings evolved and collapsed themselves and the rest of the branch of their reality into material world and that objects remain in a state of actuality only so long as they are being observed by humans (Goswami, 1993)²⁷. The other view that even non self conscious organisms or even electrons can cause wave function collapse, has also been put forward (Herbert, 1993)²⁸. Whatever may be the case, the fact remains that the idea of wave packets spreading out and collapsing is not based on hard experimental evidence. Accordingly, we are inclined to go along with Bohm’s ontological interpretation that wave function gives only ill-defined and unsatisfactory notion of wave function collapse. Alternately, he suggests the real existence of particles and fields: “particles have a complete inner structure and are always accompanied by a quantum wave field; they are acted upon not only by classical electromagnetic but also by a subtle force, the quantum potential, determined by quantum field (Bohm and Hiley 1993)²⁹; Bohm and Peat, 1989³⁰; Hiley and Peat, 1991³¹. (See also Eccles in Chapter 5).

We cannot go into the detailed entanglement of Bohm’s arguments, suffice to quote that particles are guided by quantum potential and provide connection between quantum systems. This represents a vast energy pool, recognized by standard quantum vacuum, underlying the material world. Very little is known about quantum vacuum (zero potential field) but its energy density is astronomical (10^{108} J/cm³). It is on this basis that he postulates: “It is quite possible that while the quantum theory, and with it the indeterminate principle, are valid to a very large degree of approximation in a certain domain, they both cease to have relevance in new domains below that in which current theory is applicable. It is interesting to note as stated by him that observation is not a necessary test for proving the existence of quantum world when it lies beyond its measurable domain, i.e., below the recognized quantum world. He, therefore, rejects the positivist view that something that cannot be measured or known precisely cannot be said to exist”. In other words, he does not confuse epistemology with ontology (compare this with Kant’s critique of pure reason).

After having addressed monistic materialism and dualism in the context of consciousness, (ego, self), now, in the same context, it will be worthwhile to explore the possibility of whether insight into mysticism can be of any help in enhancing our understanding of the physical and biological intricacies involved in unfolding the mystery of consciousness. Setting aside the postulate of reductionists for a while, we turn to biologists and find out how they have found solution to the complicated biological phenomena such as the structure and function of genes. Without exception their approach has been to analyze the simplest variant of a complex structure and then seek an answer to the functional properties of a complicated system. Probably the most famous is the well known humble bacterium *E. Coli*. Its simple gene structure has allowed us to understand much of the gene functioning of complex species (opening up the field of genetic engineering). Similarly, many biologists have turned

to the "memory" of a simple sea slung to understand our own more kaleidoscopic memory. In the same vein, as Iqbal has insisted in the *Reconstruction*, the real solution of the thickest of consciousness may be available in mystic experience. The question for us then is: what is mystic experience? How it operates and being individualistic, how can it be generalized? We will take these questions in the same order.

In recent years Robert Forman (1996)³² has succinctly addressed the question: Why mysticism? In his opinion

mysticism represents a simple form of consciousness. Usually our minds are enormously complex streams of thoughts, feelings, sensations, wants, snatches of songs, pains, drives, daydreams and, of course, consciousness itself, more or less awake of it all.

This is all "noise" and "detritus". The task of a mystic is: (a) to clear away the noise to the extent possible; (b) to accomplish this he uses some forms of "meditation" or "contemplation", (c) to recycle mental subroutine and thus systematically reduce mental activity; (d) to slow down the thinking process and to have fewer or less intense thoughts; and (e) to cause reduction of attention (minimize) to bodily sensations taking him away from fantasies and day dreaming. By using the techniques listed at (a) – (e), there is an inner calmness that prevails leading to complete silence inside. This is a perception and thought free state. Both mental and sensory contents evaporate into nothingness. In spite of this prevailing calm, a mystic "emerges confident that he has remained awake inside, fully conscious." In Iqbal's words this is what he calls higher consciousness. In both cases this level is "wakeful and contentless (non-intentional?). We have put a question mark on the word non-intentional for the reason that in our opinion the status of non-intentionality is subject to scrutiny - to be discussed later.

Let us find out what Iqbal has to say about mysticism. Some of his views have already been discussed in the preceding chapters. We will now summarize his views, in particular, on finite-infinite contact happening through what

he calls mystic experience. According to him, "It is especially in the period of 'discovery' that metaphysics is replaced by psychology and religious life develops an ambition to come into contact with ultimate Reality." He has recognized several features of this phase. **First**, the epistemological structure of this experience is different from the normal (sensible) experience. **Second**, it is erroneously assumed that it is life-denying process. **Third**, for scientists it is "opposed" to "empirical outlook of our time." **Fourth**, religious experience in its higher form "recognized the necessity of experience as its foundation long before science learnt to do so. In this regard, therefore, the only difference lies in the qualitative nature of experience. And as Iqbal says, "So it (religious experience) is a genuine effort to clarify human consciousness, and is, as such, as critical of its level of experience as Naturalism is of its own level." This ingenious line of argument, it may be observed, describes a circle around consciousness and experience. Indeed, Iqbal is trying to convey to us that in the mystic state there are long term shifts in epistemological structure which take the form of sequential quantum leaps in experience. This aspect has extensively been explored by Forman (1996)³³. According to him, the first step is "an experience of a permanent interior stillness even when engaged in thought and activity. This is a state in which one is aware of one's awareness while simultaneously remaining conscious of thoughts, sensation and actions. This has been called a dualistic mystical state (DMS). In the second phase it is described as a perceived unity of ones own inner experience. – the so-called "Unified mystical state" (UMS). This culminates in pure conscious experience (PCE) or what Iqbal states as higher conscious experience (HCE). Both ending up in a unified mystical state (UMS). It appears to us that a thought of high intensity (for example, a sustained ambition to come in contact with Ultimate Reality) may contribute to the persistence of the unitive mystical state. Similar views have been expressed by Williams (1995)³⁴ and Chalmers (1995)³⁵. Taken together, in

agreement with Iqbal (1930)³⁶ and Forman (1995)³⁷ we are inclined to draw the conclusion that advanced mystical experience results from PCE with elimination of **Sensible activity** and a relatively high intensity of a unitive desire to sense its own quiet interior character more and more fully. Going a step further, Forman (op. cit.) distinguishes between **apophatic** and **kataphatic** mysticism. The latter is associated with sensory experience and involves hallucinations, visions, auditions or even sensations like smell or taste while the former uses non-sensory language. So far, we have not attempted to relate mysticism with any particular theory of consciousness. Yet, we cannot avoid making a statement that it involves "phenomenological dualism" accommodating both normal experience and inner religious experience.

In dealing with mysticism, one question must be attended to carefully. This relates to the reliability and validity of the mystic experience, *per se*, since all mystic experiences are individualistic (first person). Would it then be justified to generalize such first person (subjective) experiences? Not necessarily, unless hard analytic approach is applied for arriving at a balanced equation for the consumption of a concrete mind. Iqbal in developing his metaphysical thesis on inner religious experience takes cognizance of this aspect. He is aware that religious experience is "incommunicable". But "this does not mean that religious man's pursuit is futile". Why he makes this categorical statement? The reasons he cites have a considerable merit. First, it is only through religious experience that one can touch the heights of consciousness (ego). The same ego in daily life enters into sensible intercourse with the worldly objects around him, including the social norms. These characteristics of ego, living in serial time and absolute space, are of fundamental importance for normal experience (verifiable). This he calls "conceptually describable habitual selfhood". There is, however another level of ego (self, consciousness) in which during inner religious experience, a stillness and calmness prevails inside, receiving no impulses from the outside world.

It is a period of "discovery" - a period, in which a single desire of coming in contact with the Real entangles consciousness in its Pure form (PCE of Forman, or higher consciousness in the words of Iqbal). During this period, the self-entirely under the control of pure consciousness, divorces itself from real time and space and thrives in what Iqbal calls "Divine Time" and "Divine Space" (see for example, his reference to Iraqi in the *Reconstruction*). Further, the "unique metaphysical status, which the self enjoys under the spell of higher consciousness" is not a conceptually manageable intellectual fact; it is a vital fact, an attitude consequent upon an inner biological transformation which cannot be captured in the net of logical categories "in this form alone the content of timeless experience can diffuse itself in the time movement and make itself effectively visible to the eye of history." This is why he quotes Mohyuddin Ibn al-'Arabi that "God is a precept, the world is a concept."³⁸ Thus, in view of the reasons cited above, Iqbal believes that the method of dealing with reality by means of 'concepts' is not at all a serious way of dealing with it. Citing the inadequacy of science, he remarks that "science does not care whether its electron or (quark) is a real entity or not. It may be a mere symbol, a mere convention." Further, being highly critical of science he is dismayed that science has "ignored metaphysics altogether" in so far as the discovery of ultimate nature of Reality is concerned. He, however, concedes the involvement and control of "psychological and physiological processes" in tuning up the ego (self), for an immediate contact with the "Ultimate Reality". Such an experience, Iqbal thinks, "cannot but be individual in form and content." Hypothesizing on the existence of "potential types of consciousness lying close to normal consciousness,- he asserts that "the question of the possibility of religion as a form of higher experience is perfectly legitimate one and demands our serious attention." This is an excellent array of metaphysical arguments, yet, in view of the ascendancy of

modern naturalism, it may be difficult to convince a concrete mind as Iqbal remarks himself that:

Modern atomism is however, unique. Its amazing mathematics which sees the world as an elaborate differential equation; and its physics which, following its own methods, has been led to smash some of the old gods of its temple, have already brought us to the point of asking the question whether causality – bound aspect of Nature is the whole-truth about it? Is not the Ultimate Reality invading our consciousness (and thus, ego) from some other direction as well. Is the purely intellectual method of overcoming the Nature the only method?

For Iqbal the “modern man with his philosophies of criticism and scientific specialism finds himself in a strange predicament. His naturalism has given him an unprecedented control over the forces of nature.” Citing the example of evolutionary theory, he rightly points out: “How the same idea affects different cultures (Rumi in the East, and Darwin in the West)? In his view, mysticism in no way is linked with renunciation. If anything, it has to be used for expanding the world view of Islam, both for the mundane and spiritual progress of life, enabling man to live soulfully.

An account of Muslim mystics (Sufis) is available in: *A History of Muslim Philosophy* (1963).³⁹ We will, however, confine ourselves to the experiences of only a few well known mystics whose contributions to inner religious experience in the period ranging from 8th to 12th century illuminated the firmament of the Muslim world. Among them are included: Muhasibi (701-857), Hasan of Basrah (776), Rabiah al-Basri (713-801), Bayazid Bistami (d: 874), Junaid of Baghdad (d.910), Abd al Qadir Jilani (1077-1166), Shihab al-Din Suharwardy (1144-1253), Shihab al-Din Suharwardy Maqbul (b.1153) and Ibne ‘Arabi (b.1165), among others. One of the earliest authentic works on Sufism is available in *Kitab al-Luma* of al-Sarraj al-Tusi who died in 988 A.D.). His work has been quoted extensively by a number prominent writers on the subject (al-Qushairi,⁴⁰ Ali Hajwairi (1330-AH),⁴¹ Farid al-Din Attar⁴² and al-Ghazali⁴³.

Rabiyah al-Basri (706-859) being unique amongst early mystics, presented the doctrine of “disinterested love of

God”, which served both as a motive and a goal for her. This eminently distinguishes her from her contemporary mystics who would turn to Sufism either to seek reward of paradise or deliverance from hell. She adopted the axiom “that God is worthy of worship even if there is no motive of fear or reward.”⁴⁴ It has been narrated that one day she was carrying fire in one hand and water in the other. When asked: “What does this mean?” She replied: “I am going to light fire in the paradise and pour water on hell so that both may disappear and those seeking love of God may not do so for fear of hell or reward of paradise.”⁴⁵ Thus, the object of disinterested love, according to Rabiyah was union with God. She says: “My hope is for union with Thee, for that is the goal of my desire.” Bayazid Bistami who died in 874 A.D., made an interesting statement that “a mystic can reach his goal through blindness, deafness, and dumbness”⁴⁶. This statement conveys the fact that a mystic enjoys complete inner stillness by cutting himself off from all external sensible bodily experiences. A similar mystic state has been recognized by Forman (1996) when he refers to pure conscious experience (PEE). Bistami describes his experience in the following words: “For twelve years I treated the self (ego, consciousness) in me as a smith does with his material”⁴⁷ heating and beating alternately in the fire of penance and with the hammer of blame, till it becomes a mirror. For five years I was busy polishing this mirror with different kinds of religious practices. For one year I looked within myself then I found everything dead before me and God alone living.” Attar, (132 A.H.). It may be noted that his experience of the state of unity resembled one of al-Hallaj (ann al-Haqq). “I went from God to God, until He cried from me in me, “Oh thou I, Glory to me: How great is my majesty.”⁴⁸ When I came out of myself I found the lover and beloved as one, for in the world of thought, all is one. This is why Iqbal quotes: “God is a precept and not a concept” This precept is more vividly narrated in a state of higher consciousness identified as ascension, “As I lived through Him, I became eternal and

immortal, my tongue became the tongue of unity and my soul the soul of abstraction. It is He who moves my tongue and my role is only that of an interpreter; talker in reality is He, and not I".

We find a different kind of mystic in Junaid of Baghdad. Unlike Hallaj and Bistami who drank deep from their unitary experience and were intoxicated, Junaid advocates sobriety, because in this frame of consciousness, one maintains awareness of his self and does not lose sanity (as in intoxication). The story goes that when Hallaj visited Junaid, he refused to accept him as his disciple. Yet, Hallaj remarked, "O' Shaikh sobriety and intoxication are two attributes of man, and man is veiled from his Lord until his attributes are annihilated." Junaid's advocacy of the principle of sobriety *à la* mystics combined with his deep knowledge of theology, jurisprudence and ethics made him a model sufi (mystic) who was acceptable by all schools of Islamic thought. A relevant book on him: *Junaid of Baghdad* (Kazim 1995)⁴⁹ may be of interest to the reader.

A word about Hallaj at this stage would be in order because of the prevailing confusion about him between theologians and the students of mystic science. He was executed because of his two utterances: (a) "I am the creative truth." (ann al-Haq) and (b) "Destroy your Ka'bah". Iqbal defending Hallaj, indeed, thinks that "experience in the religious life of Islam reached its culmination in the well known words of Hallaj- 'I am the creative truth.' He refers to the French orientalist Massignon, whom he met in Paris. The fragments of Hallaj, collected and published by Massignon leave no doubt that the martyr saint could not have meant to deny the transcendence of God. We have already referred to the dialogue between Junaid al-Baghdadi and Hallaj. It is obvious that Hallaj belongs to the category of intoxicated mystics, which, in our opinion, though overwhelming, is not surprising. This state of higher consciousness, Iqbal thinks is "the true interpretation of his experience. It is not the drop slipping into the sea, but the realization and bold affirmation in an undying phrase of the

reality and permanence of the ego (consciousness) in a profounder personality." This is indicative of "unknown levels of consciousness". We intend to place this important statement within the ambit of our unified theory of consciousness when we will make an attempt to synthesize modern advances in physics and psychology: certainly, methods are now available which may enable us to assess various levels of consciousness as "knowledge-yielding experience." There should be little hesitation in accepting the statement of Iqbal that "the concepts of theological systems draped in the terminology of a practically dead metaphysics (can) be of any help to those who possess a different intellectual background."

Abd al-Qadir Jilani who lived between 1070 AD and 1166 AD makes a reference to four stages of spiritual development providing an almost verifiable content in mystic literature. The four stages include: (a) **Piety**: when a person follows the religious law meticulously, (b) **Reality**: which is identical with saintliness. In this stage directive force (*Amr Rabbi*) is more evident and the inner voice dominates any other sensation, (c) **Resignation**: when the individual submits completely to God and (d) **Annihilation**: which is a level of consciousness merging the finite into infinite (as a precept), this is the unitive state. These stages are not different from those identified in the recent literature on mysticism (Forman 1996). For the Sheikh the onerous duty of a mystic is to lead the people to the way of God. An ideal mystic is one, "who, by example of his life and the words of his mouth helps the ignorant and misguided to the way of righteousness." The mystical approaches adopted by Shihab al-Din Suharwardy (1144-1234 AD) and Shihab al-Din Maqtul (b.1153 AD) though more comprehensive and rigorously specified, address the stages of mysticism more or less in the same way as identified by Junaid of Baghdad.

In the history of sufistic Islam Ibn al-'Arabi's life and works have been lauded and criticized by various schools of thought. He was born at Murcia-South east of Spain in 1165 AD. His writings vacillated between pantheism and

monotheistic doctrine of Islam. In finding a common fabric for the teachings of Islam, he uses esoteric language for mysticism and exoteric language for Islam. Yet, he is recognized as a pre-eminent thinker and a mystic. His mystical philosophy is a blend of thought and emotions, reason and intuitive knowledge. Again and again he refers his readers to mystic intuition. We are not concerned here with how far his philosophical and mystical ideas were in harmony with the established dogmas of Islam; indeed, we have included him in this discussion only for his views as a mystic. Reading between the lines, one can easily understand that he is a strong supporter of unity of being. He is the one who declares that "God is a precept not a concept." Contrary to this Bayazid of Bistami and Junaid of Baghdad, speak of unity of vision, which we think is easy to explain on the basis of modern literature on mysticism and consciousness.

Mysticism continues to be a subject of extensive discussion in modern literature. Much of it, scientifically, or even from religious point of view, has developed in the lap of consciousness (ego, self). One intriguing issue which has created difficulties of interpretation and verification relates to the fact that inner religious experience, whether in the past, or even today, constitutes unusual first hand reports of the mystics and is thus subjective. This criticism can be overcome by averaging out all personal experiences (as in experimental data). When we do so, it becomes a simple matter that there is unequivocal similarity in the experiences narrated by all genuine mystics to whichever religion they belong. The case of Muslim mystics has already been discussed. Forman (1998)⁵⁰ in his review has given an account of such experiences from mystics belonging to different faiths. Some of these reports are quoted below:

The first report is from Teresa Avila of what she calls the 'Orison of Union.'

"During the short time the union lasts, she is deprived of every feeling, and even if she would, she could not think of anything else. She is utterly dead to the things of the world I do not even know whether in this state she

has enough life left to breathe. She is unaware of it. The natural action of all her faculties are suspended. She neither sees, hears, nor understands (James, 1902, p.409).

Note how similar is this statement with that of (a) Bayazid Bistami: A mystic can reach his goal only through blindness, deafness and dumbness; and (b) Attar: the more a man knows God, the more is he lost in him.

The second report is from Eckhart who also asserts the absence of sensory content as well as mental objects. The more completely you are able to draw in your powers and their images which you have absorbed, and the further you can get from creature and their images, and the nearer you are to this and the readier to receive it. If only you would suddenly be aware of all things, then you could pass into an oblivion of your own body as St. Paul did In this case memory no longer functioned, nor understanding, nor the senses nor the powers that should function so as to govern and grace the body In this way a man should flee his senses, turn his powers inward and sink into an oblivion of all things and himself. (Walsh, 1970, p.7).⁵¹

Thus, Whatever side of the lectern we sat, one thing is certain that when in a mystic state, be it the 'fourth stage' of Junaid of Baghdad, or *fana* (annihilation) of 'Abd al-Qadir Jilani the bodily senses are eliminated and in the stillness that ensues, it is only inner religious experience which rides on the shoulders of higher consciousness that the ego is guided towards the intellectual vision (perception) of the Ultimate ego. This may be readily accepted on metaphysical grounds and as mater of faith, yet, the question—'how it happens', remains to be answered. It will be in search of this answer that in the chapter which follows, we will synthesize physical, biological and psychological evidences, already discussed in various chapters, to come up with a possible unified theory of consciousness and the way it controls the ego (self)..

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CHAPTER – VII

A UNIFIED THEORY OF
CONSCIOUSNESS-II
(Synthesis)

In our search for a physical, psychological and religious basis for inner religious experience, we have already dealt with a diverse matrix of evidences, each with its own strengths and weaknesses. The reader will appreciate that none of these creeds taken separately can lead us to a fuller understanding of consciousness (ego, self). The case of religion is, however, different. It has its own arena of knowledge, which, in essence, has to be accepted as a matter of faith. Yet, for satisfying the concrete mind, as Iqbal desired, it seems legitimate, that we sift out the fragmented truth unveiled by recent scientific discoveries in support of the revealed knowledge. This is precisely the direction which Iqbal chose in the *Reconstruction* and handled it with admirable ease. For him normal experience and religious experience are subsets of experiential holism, though for the later we are still hunting for sensitive and reliable methods of verification. There are indications, however, that such methods do exist and presently are under intense investigation. Accordingly, the premise we have set out in the foregoing chapters,

encourages us to find out if it can help us reach a meaningful conclusion with regard to a unified theory of consciousness (self, ego). This we will do now, first by stating a few premises followed by a synthesis that could give us a direction we are seeking with regard to inner religious experience. Accordingly, we begin with the first premise.

FIRST PREMISE

For soul Iqbal uses the word ego. For him ego (Soul) is not a substance, as understood by theologians. Not being a physical object, it does not occupy space. Yet, it has a personality having peculiar relationship with body; on the one hand, it has the characteristics of dealing with it in serial time appreciative of its sensibilities, and on the other hand, it enjoys the luxury of elevating the body and landing it in Divine time and Divine space mediating its contact with the infinite. The freedom of the ego is its generic property emanating from the Directive Energy (*Amr-e-Rabbi*), and inherent *ab-initio* in all types of matter, living or non-living. Being a product of Directive Energy it is immortal. In this sense one may wonder, whether this concept has similarities with the homogeneous substance of Spinoza? Perhaps Yes, since the word substance used by spinoza implies something beyond the physical being (Durrant,1933).¹ We may be skeptical about Iqbal's views but the significance of his views about ego can be best appreciated if his metaphysical dimensions are fortified, to the possible extent, with the available scientific evidences. This takes us to the second premise.

SECOND PREMISE

We have already argued that ego, self and consciousness are nearly synonymous. We continue to maintain the same view. Presently, we find a fresh wave of literature on consciousness, which mostly converges on the structure and function of the brain. No wonder, then, that we are now passing through a period of consciousness paradigm. On this subject, in the chapter on biophysics of consciousness, we

have already dealt with the role of prefrontal integration modules (PIMs) located in the frontal lobe of the brain. The PIMs are the neuronal aggregations which receive all kinds of sensory stimuli, integrate them, and then send appropriate efferent messages for appropriate response (s) warranted by the situation. It has been suggested that in the brain with consciousness (as in humans) the thought products are generated only from the PIMs. How sensory information is represented within the PIMs, within the memory system, and between the two is diagrammatically shown in figure 7.1.

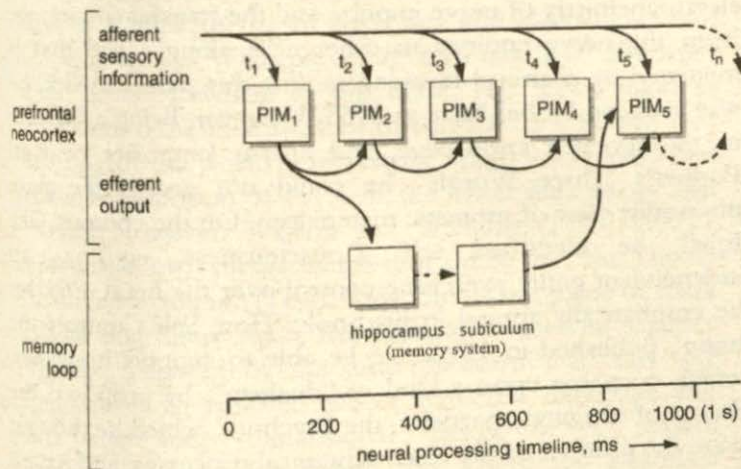


Figure 7.1: Sensory information through the prefrontal integration modules into the memory system and back again to the prefrontal region. The whole sensory process and its motor response take 200 milli seconds. (Adapted from Pico, M: Consciousness in Four Dimensions, 2001).

It may be noted that one cycle of sensory representation within a PIM takes about 200 milli seconds. This results in efferent output to the adjacent PIMs, the memory systems, and other target regions, affecting their activities at the same rate. On the basis of this and much more information about the input/output integration by PIMs; it has been assumed

that this region is the site of thought generation and thus of consciousness. This assumption gives a purely physical basis to consciousness (ego, self) to which it is difficult to agree in view of several other contradictory evidences already discussed in earlier chapters. However, one can concede that this part of the brain, that is, PIMs can constitute an important link between mind (consciousness, ego, self) and activities of the brain in serial time in periods of sensibility. This takes us to the third Premise.

THIRD PREMISE

We derive our third premise from Eccles' work on the electrochemistry of nerve impulse and the transfer of message from the nerve endings to other cells along a gap that is mediated by chemical messengers. For this pioneer work, he was awarded Nobel Prize in 1963. However, being a believer in the revealed knowledge, and ardent supporter of Karl Popper's 'Three Worlds', he could not accept the pure physicalist view of monistic materialism. On the contrary, like Iqbal, he identified self (Consciousness, ego) as an independent entity exercising control over the brain. For this he emphatically argued in his book: 'How Self Controls the brain', published in 1992.² To be able to support his views, which converge upon a kind of "dualism", he proposed the theory of imaginary particles, the Psychons, which he thought were the product of the electrochemical processes, and have a strong nexus with non-material self (consciousness, ego). Indeed, using the medium of Psychons he came out with the concept of 'fields' (field theory) to satisfy the quantum probabilistic interpretation of the phenomenon involved in the control of the brain (material) by the self (non-material). We have discussed his views in sufficient detail in chapter 5. In the same chapter we have compared Eccles' interpretations with that of Iqbal. His field theory continues to be a subject of extensive discussion (see for example, Watson and Williams, 2003).³ On the whole, however, we find considerable merit in Eccles theory, since it makes an attempt to combine known physics with hitherto unfathomed

physical processes supposedly operating below the observable quantum physical levels. This aspect has been neatly emphasized by Penrose (1990)⁴ who suggested that new laws of physics and mathematics have yet to be discovered to answer the difficult questions raised by the biophysics of consciousness. We can comfortably go along with several aspects of Eccles' theory provided that the modifications suggested in some recent studies are kept in view (Watson and Williams)⁵.

FOURTH PREMISE

Our fourth premise is based on the incisive and brilliant critique of Eccles' theory of psychons and electro-chemical fields. (Watson and Williams, *op.cit*). This has been discussed in some detail elsewhere in this book. His views stand in juxtaposition to the Putative Law of entropy. It is known that the entropy of the world is increasing. Also, it is agreed that better the organization of a system, the lower the entropy and vice versa. However, Watson and Williams (1993, 1997)^{6,7} presented their own theory which they called the "the Theory of Enformed Systems" (TES). This interesting piece of work postulated that 'there exists fundamental conserved capacity to organize, denoted by the term 'Enformy'. In this way disorganization is opposed where enformy organizes and sustains the four dimensional fields of a system (enformation). In our opinion, this interesting postulate enriches our understanding of consciousness by further strengthening the psychon field theory of Eccles and of Iqbal's underpinning of ego (self, consciousness). This theory is likely to provide some justification even for the physicists (reductionists). There is little difference between the SELF of Watson and self of Eccles (Watson 1993).

The SELF of Watson is acronym for Singular, Enformed, Living Fields (SELF). Accordingly, the SELF means the linking of memory of conscious states which are experienced at various times during the life time (linkage with awareness). For our purpose there are three features of this theory, which have attracted our attention. First, the SELFs correspond to

the organization inherent in our coherent systems, ranging from photons to humans and beyond, because they are continuous in space-time, but discontinuous in space. Second, the SELF organizes its own state at a given time integrating past and present in space-time. Third, the last named attribute accounts for telepathy, remote viewing, pre-cognition, psychokinesis, and to which may be added even revelation in the mystic state. The way this theory solves some of the caveats of Eccles' theory of psychons, especially the binding problem has been fully substantiated in chapter 5. Suffice to point out here that according to this theory, unlike that of Eccle's theory, brain is not necessary for memory content in organized states of higher consciousness. Furthermore, if anything, it enhances the acceptability of Eccles' field theory when the same is replaced with TES of Watson. This takes us to the fifth premise.

FIFTH PREMISE

This assumption relies on the work presented by Pratt (1977)⁸ in his book *Consciousness, Causality and Quantum Physics*. His most challenging concept lies in the statement that:

*"it is quite possible that while the quantum theory, and with it the indeterminacy principle are valid to a very high degree of approximation in certain domains, they both cease to have relevance in new domains below that in which current theory is applicable (Bohm and Hiley, 1993)."*⁹

In our opinion, expressed elsewhere as well, this statement provides a meeting ground for physics and metaphysics and lends support to the existence of a 'Directive Force' as yet un-explored by the currently known principles of quantum physics, extending at best to Planck's constant. Additionally, the Physicists are aware of the collapse of waves function in a mysterious way –violating the Schrodinger equation. For this reason Bohm's tautological interpretation that wave function gives only ill-defined and unsatisfactory notion of wave function collapse seems valid. It appears that the alternate arguments about particles having a complete inner structure accompanied by a quantum wave field merits serious consideration; the particles are acted upon not only by

electromagnetic field, but also by a subtle force-the quantum potential determined by quantum field. Thus, particles guided by quantum potential (perhaps equivalent of 'Directive Force') provide connection between quantum states. It has been claimed, that quantum potential recognized by standard quantum vacuum, underlying the material world has an astronomical energy (of the order of 10^{108} J/cm³). What else this energy could be if not a manifestation of the 'Directive force'? The elegance of quantum physics apart, we cannot escape the conclusion that observation is not necessary for proving the existence of quantum world when it lies beyond its measurable domain, that is below the recognized quantum world. Is it not true of the transcendental as well? Kant's critique of pure reason may be re-examined in this perspective. This now takes us to the sixth premise.

SIXTH PREMISE

Recalling the structure and function of the brain discussed in chapter 6, we may, without reservation agree to the presence of neural networks, in the form of assemblies and sub-assemblies. It has been estimated that there are about 10^9 neurons in the brain. However, each assembly is comprised of 10,000 neurons (Dennet, 1967, 1975).^{10,11} We may accept the electrochemical nature of the stimulus passing through the nerve fiber and reaching the nerve endings evoking response in other cells. The code translating the message at the nerve ending is not known. Certainly, it is not similar to the binary code used in computations performed by a computer. Accordingly, any attempt to formalize artificial intelligence will remain a wild goose chase till such time that the neural code is broken. We have seen that sensory messages are analyzed and integrated in the prefrontal integration modules (PIMs) and their coordinated action responses are realized through efferent pathways as directed by PIMs. We may agree that this apparatus is necessary for thought production. It has already been argued that thought is a necessary companion of consciousness (ego, self). It perpetuates beyond serial time during higher order

consciousness in mystic states. It is our considered view that in spite of mystic stillness neural assemblies are at work in a monolithic thought process, which incessantly feeds the peculiar conscious state divorced from serial time and normal neural sensibilities which are, so obvious in normal experience. We attribute this property to inherent 'Directive Force' which begins to operate from the time of fertilization of the ovum and continues its activity through the law of recapitulation: ontogeny repeats phylogeny. All this happens under the spell of 'Directive Force' unleashed by the genetic code. We are inclined to agree that neural networks and religious experience are catalyzed by self (consciousness, ego) as envisaged in Eccles field theory and Watson's theory of TES. We are also inclined to propose that self (consciousness, ego) is something above and beyond the ordinary physical process. It operates from a higher order of non-physical substratum occupying phenomenal space. Furthermore we do believe that consciousness is a product of evolution reaching its climax in humans, and bestowing high survival value to this species. It has the peculiar characteristics of operating in serial time and beyond, which Iqbal calls Divine time. Not surprisingly, Penrose (1990)¹² has made a strong case for the existence of consciousness, though in a rudimentary form at the lowest level of organic life. His identification of microtubules in paramecium (used for sense perception) with identical microtubules in the neural fibers is a bold attempt to bring quantum mechanical continuity between the lower and higher forms of life. This takes us to the seventh premise.

SEVENTH PREMISE

A brief description of phenomenology has already been presented. Here we will take note of two aspects of this philosophy, namely, phenomenological space and phenomenological time. Both are relevant to the theory of ego (self, consciousness). If we accept, as we have done so far, that soul (ego, consciousness) is a non-material entity and does not occupy space, and yet it controls the brain (Iqbal, 1930; Eccles, 1992),^{13,14} then what line of argument can we

adopt to show that even non-material consciousness has a spatial character? To some extent this dilemma has been resolved by suggesting the existence of phenomenal space for consciousness as envisaged in TES. It is to be realized that "space which traditionally has been denied to consciousness is physical space since we have no idea of precise relationship between matter and experience" (Dainton, 2000).¹⁵ It follows from this that we also have no idea of the precise relationship between experience and physical space which the matter occupies. If this be so, as is obvious, then it is logical to conclude that experience does not occupy physical space at all. Yet, there is a strong case for stating that all our experiences, without exception, seem to be located somewhere in the physical space as, for example, occupied by any physical objects. Accepting this later premise we have already insisted that this is applicable to perceptual experience only (the normal experience as stated by Iqbal). Now, a person may be handling a series of physical events, in which case a number of spatially connected co-consciousness experiences are involved in the operational activity within a single unified three-dimensional phenomenal space (Kant, 1980).¹⁶ This level of consciousness, by and large, necessarily has to be unitary because of binding of conscious experiences in the same compact. We have no hesitation in accepting this concept in as much as perceptual conscious experience is concerned.

This, however, does not solve our problem with regard to the implications inherent in inner religious experience. The reason being that in mystic states, all sensations, afferent or efferent, are in a state of suspension (Forman, 1992).¹⁷ Perhaps the memory of such sensations is obliterated. Thus, agreeing with Dainton, (2000),¹⁸ we are inclined to propose that in such states higher levels of consciousness come into operation with a single perpetuating thought, for instance, of the transcendental which is characteristic of the mystic state. This, in our opinion, is what has been called intellectual consciousness. It is this level of consciousness which is the

essence of the ego (Iqbal), of the self (Eccles) and of SELF (Watson) which influence the brain whereby, the neural assemblies of Dainton¹⁹ and prefrontal integration modules are made subservient to the influence of self (mind, ego) unleashing electrochemical activity of repetitive nature under a unitary stimulus. It appears that it is on this basis that Eccles has proposed the theory of psychons and Watson has strengthened it with his theory of enformation. This level of consciousness we speculate operates in the space-time paradigm, in which time is non-serial and the spatial dimensions do not conform to Newtonian space or Einstein's space-time relativity. Clearly, then, there are two levels of consciousness, the normal operating in serial time under the integrative control of PIMs and the other the higher level of consciousness operating in non-serial time giving possible credence to Iqbal's notion of Divine time and Divine space in the realm of inner religious experience. This takes us to the eighth and last premise.

EIGHTH PREMISE

Iqbal (1930),²⁰ and Forman (1999),²¹ both agree that mystic experience, at best, is subjective. Iqbal in fact goes a step further and draws distinction between mystic and a prophetic experiences when he quotes Maulana Abdul Quddus of Gangoh²². Whereas both experiences are subjective, the mystic keeps it to himself, but the prophet shares it with others as ordained through revealed knowledge. Unlike the normal experience, the religious experience is ordinarily non-verifiable. Towing the line of reductionists, any experience, which is non-verifiable, should be rejected out of hand. With a large amount of scientific evidence, which we have been able to put together, the reductionist view point falls apart. Even the physicists now agree that what is not visible or verifiable within the domain of quantum mechanics, cannot necessarily be denied. Accordingly, there is considerable merit in Iqbal's contention that mystic experience is a valid source of knowledge.

THE HYPOTHESIS

The eight premises stated in the previous sections essentially summarize our views expressed in various chapters of this book. We can now use these premises for articulating a unified theory in support of inner religious experience. The hypothesis we are going to construct is essentially based on (a). Iqbal's metaphysical approach in the *Reconstruction of Religious Thought in Islam* (1930),²³ especially the Directive Energy (b). Forman's thesis about what mysticism has to teach us about consciousness (1999),²⁴ (c). Eccles theory of how the self controls the brain (1992),²⁵ (d). Watson and Williams theory of enformy (2003),²⁶ (e). Bohm and Hiley's theory of sub-physical quantum activity,²⁷ (f). Karl Poppers theory of 'Three Worlds' as described in his book: 'The Self and its Brain' (1977),²⁸ (g). Alwyn Scott's *Stairway of the Mind* (1995),²⁹ (h). Hebb's theory of neural networks (1949, 1980),^{30,31} (i). Schrodinger's lectures delivered in Trinity College Cambridge on 'Mind and Matter' (1956),³² (j). Roger Penrose's Book 'Emperor's Mind' (1989),³³ (k). Crick and Kock's Neurobiological theory of consciousness,³⁴ and (m). Dennet's 'Consciousness Explained' (1991),³⁵

Iqbal relies on the distinction between the words: *Khalq* (creation) and *Amr* (Directive Energy) as they appear in the text of the Qur'an in its various sections. However, since 'Directive Energy' will figure prominently in our own thesis on consciousness (Ego, Self), it will be worthwhile to explore the full significance of the term as it appears in an authentic lexicon of Arabic language. For this, we will turn to Leghat-al-Qur'an compiled by Ghulam Ahmed Pervaiz (1960).³⁶ Like Iqbal, Pervaiz refers to Pringle Pettison when he quotes him that - 'it is inadequacy of English language which has only one word for the process of creation (*Khalq*), though it was necessary that two separate words were available for perceptive (physical world) and the non-perceptive (spiritual world). It is in this context that the Qur'an uses two separate words, that is, *Khalq* and *Amr*. It is a matter of common understanding that creation is an act in which a final product,

assembled from various elements, appears in complete appreciated form. Yet, the process involved in the act of creation must receive a putsch from some source of energy. This is what Iqbal recognizes as 'Directive Energy'.

It may be noted that various meanings have been assigned to the word 'Amr' according to the context in which it appears in various sections of the Qur'an. For example: (a) Consultation (Al-Qur'an: 26:35; 7:110; 65:6; 28:30), (b) Abundance of something (Al-Qur'an: 17:16), (c) Command (Al-Qur'an: 2:67; 16:23) and (d) Desire or Accord (Al-Qur'an 18:82), among others. Yet, of particular interest to us is the Ayah 7:54 in which *Khalq* (creation) appears in juxtaposition to 'Amr' (command). Here, as we have already stated, '*Khalq*' means to create new things by various procedures from an array of elements. '*Khalq*' thus is a stage when things appear before us as perceptive entities. All stages prior to this that is in the planning process inherently belong to the 'Directive Energy' emanating from the transcendental. The 'Amr' (direction) we are referring to permeates every segment of the universe from the tiniest quarks to the humans. The laws that regulate the universe are the consequence of the same 'Amr', which preceded the 'big bang'. 'Amr' is the organizer of these laws, which are being discovered and extended piece-meal by man (see also Al-Qur'an: 45:17 and 65:5). All this means that 'Directive Energy' is a continuous process, and at least in the case of humans, the command is not time related; it, indeed, remains in intimate relation with the soul, though the latter has the freedom to act. The following quote from the Qur'an is illustrative:

"Do the (ungodly) wait until the angels come to them or there comes the command of thy Lord (for their doom?) so did those who went but Allah wronged them not: nay, they wronged their own souls.", (Al-Qur'an 16:33)

We are conscious that the concepts developed in the preceding section will be unacceptable to a physicalist, turned reductionist, who is only accustomed to verifiable propositions through experimental data. It would therefore be

difficult for him to digest what he calls the dogmas of religion. A concrete Muslim mind may also fall victim to the same trap. Despite this, we maintain that Iqbal's concept of *Amr-e-Rabbi* has a lot to offer in this regard as we will show by extracting evidences from recent advances in Physics and Psychology. We are also maintaining that ego (soul, consciousness and self) is non-material and immortal. Further, we will argue that it controls the brain in serial time and space, notwithstanding the fact that it can also enjoy the luxury of Divine time and Divine space. For this we will have to shift our focus from metaphysical epistemic state to the world of science.

First, we will look into the origin, nature and application of 'Directive Energy'. **Second**, if soul is a non-material, then, how does it organize the functions of the body in serial time and how do we conceive its existence without occupying space? **Third**, how does higher consciousness (ego, self) come into operation and elevate itself in Divine time and Divine space for contact with the Infinite? **Fourth**, is the universe expanding? **Fifth**, what is the physicalists' view of the nature of matter and, whether the currently discussed unified theory of matter can provide a clue to the nature of the universe? **Sixth**, what significance the process of organic evolution has in relation to the 'Directive Energy'? **Seventh**, do new researches in psychology offer any hope for the authenticity of inner religious experience? **Eighth**, can we accept the reductionists point of view about the relationship of consciousness (ego, self) based on the structure and function of the brain? **Ninth**, what significance Hiesenberg's principle of uncertainty has for consciousness (ego, self) and the collapse of wave function? **Lastly**, how subjective state of inner religious experience can be raised to an acceptable level of objectivity. Answers to some of these questions have been attempted in chapters 5 and 6. Presently, we will only synthesize the already expressed views for constructing a unified theory of consciousness (ego, self).

Let us take up the 'Directive Energy'. Obviously a physicalist, as we have already stated may consider it a mere dogma. We do not accept this, since the very statement in itself is a dogma of science. Penrose (1993),³⁷ the great mathematician from Cambridge is of the view that different laws of mathematics and physics have to be worked out for the conditions prevailing prior to the big bang. The big bang model of the universe is the one, which is generally accepted by physicists, though alternate schemes have also been proposed (for example, the strong anthropomorphic principle). It has been suggested that the early universe must have gone through a period of very rapid expansion (Allan Guth of MIT). According to one estimate the radius of the universe increased by a million, million, million, million, million, million times (10^{30}), in only a tiny fraction of a second. With this information one may ponder over the allegorical meaning of the Qur'anic verse reproduced below:

"We have created heaven and earth in six days" (32:4)

The reason cited for rapid inflationary expansion of universe resides in the fact that at the time of big bang the universe had a very high temperature. At such temperatures the strong force, the weak nuclear forces, and electromagnetic forces were unified into a single force. However, as the universe cooled down past its expansion phase, the particulate energies went down and the symmetry between forces was disengaged, though, it has been claimed that temperature may drop below the critical level without the symmetry of the forces being broken. Such a symmetry of forces was essential, since the aggregation of these forces can act as anti-gravitation force in sympathy with the proposed cosmological constant of Einstein during the rapid inflationary expansion – resulting ultimately in a stabilized model of the universe. The discussion of various inflationary models is beyond the scope of this book. The subject receives excellent treatment in the book: *A Brief History of Time* (Hawking, 1998).³⁸ However, for our purpose, we would like

to correlate the implications of this speculative approach with our theme of 'Directive Energy'.

We do understand that the size of the universe was zero at the time of big bang, and as already stated, it was infinitely hot. The only matter that existed at the time comprised the photons, electrons and neutrinos and their anti particles together with some protons and neutrons³⁹. Given this circumstance, we can very well imagine that it was energy all around at that time. This raises some obvious questions: (a) where did the Energy come from? (b) did it have any direction or purpose? (c) was big bang a natural consequence of this energy? (d) unlike the present day universe what type of laws of physics and mathematics were applicable at that time to the matter at large, especially, at a very high temperature? This was a period when all forces were unified and were inherently capable of working against the gravitational pull. At best a physicist would like to answer these questions within the limitations of his known knowledge of the universe. Beyond this, even his speculative mind fails to keep company with his scientific thoughts, let alone reductionism. In spite of this he would insist that big bang was an accident, and any other source of knowledge presented to man through revelation is no better than a dogma. We are obliged to differ from this simplistic approach. Thus, in agreement with Iqbal, we do accept that religion is certainly a legitimate source of knowledge.

Even if by present standards one is able to sum up the total energy in the pre big bang matter, it would run into trillions of trillions ... of trillions of energy units. Was this to be wasted? Was it purposeless? Was it void of any direction? The answer is no. How do we interpret this? This is possible only if we concede that (a) there is only one direction, which the high-energy particulate matter could take, that is, the creation of the universe, and (b) that what existed in the pre-big bang period was simply a preparatory stage for the creation of the universe. This is what Iqbal identifies as *Amr-e-Rabbi* (Directive Energy). Accordingly, under the spell of

Directive Energy what happened was destined to happen. *Amr-e-Rabbi* is a continuum that existed *ab initio* and continues unabated. Soul (ego, self) is a manifestation of the same Directive Energy, indeed, with a modicum of freedom consistent with his characteristics (*Reconstruction: The Freedom of the Ego and its Immortality*). It may be noted as to how the continuity of Directive Energy, even after coming into existence of the universe is supported by the revealed knowledge. The Qur'anic verse: "We add to Our creation what We will" points to the expansion of universe in all directions as maintained by scientists. Interestingly enough, the phenomenon of the expansion of universe was discovered by Hubble only in 1926 using the red shift in the spectrum. Similarly, the discovery of black holes is a recent phenomenon⁴⁰. This may be judged in the light of allegorical meaning of the verse: By the star when it goes down (Al-Qur'an 103:1).

There are other lines of evidence which are consistent with the concept of Directive Energy. For this, we will first cite a few examples from biology and then extend our arguments to the world of physics. We have already referred to the principle of 'ontogeny repeats phylogeny'. This principle is guided by a built in mechanism in the genetic code of a fertilized ovum for developing into a full organism. Organic evolution as proposed by Darwin (1959)⁴¹ is nothing but a four dimensional evolution of the genetic material (DNA). The rise of consciousness in man, though co-existed with evolution of the neo-cortex in the brain, yet it surpasses the physical structures and takes on a non-physical position designated as ego or self by Eccles (1992)⁴² and Iqbal (1930),⁴³ which regulates and controls the brain activities. Is it not amazing that the single celled fertilized ovum passing through the stages of morula, and blastula reaches a new dynamic state of gastrula? It is at this stage that streams of cells passing over the dorsal lip of the blastopore in the gastrula, take their destined positions in the three germ layers, that is, the ectoderm, the endoderm and the mesoderm. It is from the

ectoderm that the neural tube takes its shape in the presence of underlying mesoderm. What forces regulate this organized differentiation of cells is not known. The dorsal lip though is known to be the organizer of the whole process. We attribute these properties of embryonic development to the Directive Energy. Another example comes from the well-known antigen-antibody interaction in living systems. The defense mechanism of the body is so designed that any foreign body (antigen) entering the living system is identified by specialized cells present in circulating blood. These cells secrete antibodies against the foreign antigens, which are captured by antibodies and are inactivated. It is highly revealing to note that these specialized cells have ancient memory extending over a period of millions of years in sympathy with the evolution of human gene pool. This is another illustrative example of the continuity of Directive Energy. Myriads of such examples are extant in biological systems, which have been discovered (not invented). Thus, in agreement with Iqbal, we have no hesitation in stating that all these processes, as we see in biological systems, are happening under the umbrella of Directive Energy, which has been operating even prior to the big bang.

We now take another look on the world of physics. Some of the most intriguing statements made by Bohm (1993)⁴⁴ and Bohm and Peat (1989)⁴⁵ have been discussed earlier in chapter 6 of this book. Here, for the convenience of the reader, we would like to reiterate that according to these workers: it is quite possible that while quantum theory and with it the indeterminacy principle are valid to a very high degree of approximation in a certain domain, they both cease to have relevance in the new domains below that in which current theory is not applicable. This may create a stir amongst quantum physicists; yet, there is little doubt that this line of thought exposes the limitations of quantum theory. Obviously, if this is true then one has to reject two major assumptions of the theory, namely, absolute indeterminism and objective existence of quantum systems only when they

are measurable and observable. Quark, for example, has not been observed as yet. Nor would it be possible unless an accelerator with energy as large as that of the sun is available (Gel Mann 1994).⁴⁶ It is only on mathematical basis that the existence of this fundamental particle has been postulated. This is also true of gluons. It simply means that something which cannot be observed (for instance, anything below the recognized quantum world) or known precisely cannot be said to exist. Is it not a rebuttal of Kant's line of reasoning and the rejection of positivist's view of normal verifiable experience? On the contrary it gives credence to Iqbal's contention that inner religious experience (normally not observable or verifiable) is as much a reality as the normal experience (verifiable). It is by the same token that a metaphysical approach which emphasizes the contact of finite with the infinite through inner religious experience could be accepted with the same conviction as we apply to the normal experience.

We have repeatedly brought under discussion the theory of quantum physics for the reason that it remains a major source of excitement amongst the physicists. Further, it remains a matter of common conviction with the physicists who generally follow reductionism as a creed. They argue that through reductionism it is possible to solve all problems related to natural phenomena including consciousness (mind, ego, self). The difficulty with reductionists is that they have not only reduced nature into smaller and smaller parts, they have reduced science itself to narrower and narrower academic specialties. The world view of these disjointed disciplines is limited to highly constricted horizons that prevent even seeing into other disciplines, much less the whole nature (Watson, 2005: the enformy page-[http://www.enformy.com/\\$enformy.html](http://www.enformy.com/$enformy.html)).⁴⁷ The reductionist approach, in our opinion, is weird, if not absurd. It reduces science to myth. Iqbal pointed this out several decades ago when he called this the dogmas of science (*Reconstruction*)⁴⁸. What appears close to reality is the approach relying on

holistic attitude corresponding to the unitary experience advocated by Iqbal.

Recently, Pratt (1997),⁴⁹ following Bohm and his colleagues (op. cit.), has examined the relationship between consciousness, causality, and quantum physics. In essence, he has accepted Bohm's interpretation of quantum theory. (for details reference may be made to chapter 6 of this book). Like Bohm, Pratt argues for ontological interpretation of quantum theory, rejecting the assumption that wave function gives the most complete description of reality possible, avoiding thereby the need to introduce the ill defined and unsatisfactory functions of wave collapse (and all the paradoxes that go with it). Instead he assumes the real existence of particles and fields: particles have a complete inner structure and are always accompanied by wave field; they are acted upon not only by classical electromagnetic forces but also by a subtle force, the quantum potential, determined by the quantum field. The quantum potential carries information from the whole environment and provides direct, non-local connections between quantum systems. This line of thought from the world of physics gives immense support to the concept of Directive Energy and solves the binding problem faced by Eccles theory of psychons when examined in the context of subtler forces in the form of quantum potential. Indeed, it has been suggested that quantum potential is extremely sensitive and complex and is a kind of vast ocean of energy on which physical or explicate world is just a ripple. Unfortunately, such an energy pool, though recognized, has been given little consideration by standard quantum theory. The same theory, however, postulates a universal quantum field – the quantum vacuum or zero potential field which underlies the material world.

From the forgoing analysis it should be clear that (a) one cannot deny the existence of something which is not being observed, measured or precisely known, (b) on this basis the positivist view requires to be revisited so that disengagement between epistemology and ontology is eliminated (Bohm,

1994),⁵⁰ (c) there is an implicate order emanating from the quantum potential (Directive Energy) which carries information from the whole environment and pervades directly the non-local quantum systems, and (e) consciousness is rooted deep in the implicate order and is therefore present to some degree in all material forms. However, one cannot ignore the fact that there might be an infinite series of implicate orders each having a matter aspect and consciousness aspect. The possibility that there are subtler levels of matter cannot be ruled out (Weber, 1990). In the perspective of this vision of neo-physicists, it should now be convenient to understand the views expressed by Iqbal and Eccles on non-materiality of soul (ego, self, consciousness), and the physical and psychological basis of inner religious experience.

We have already provided enough material on the validity of Directive Energy. Suffice to state that there are vast oceans of energy below the presently known physical structures which represent only a ripple in this vast ocean. At this level even quantum theory fails to operate. This eminently supports the reality of the continuum of Directive Energy from the pre-big bang period. This also lends credence to the non-local origin of activity, for example, from the soul (ego, self, consciousness, mind), thereby regulating the brain under certain physiological states such as mysticism. This, in a way, solves the binding problem between self (ego, consciousness) and the brain, which was difficult to explain by Iqbal in 1930⁵¹ and even by Eccles in 1992.⁵²

The ego and the freedom of the will make an interesting study in the context of present day knowledge of physics and psychology. Quantum theory is said to be indeterministic. However, as we have already argued, it is clearly open to interpretation: it either means hidden causes, or complete absence of causes. In this regard we have to take into consideration a few issues. First, if we are unable to identify a cause, it does not mean that there is no cause. Second, it is generally assumed that quantum events happen spontaneously,

having no relationship with everything else in the universe. The latter issue has to be taken with caution, since the opposite view is also available; all systems are continuously participating in an intricate network of causal interactions at many different levels (Pratt, 1997).⁵³ Apparently, though, individual quantum systems can behave unpredictably (if we ignore the non-local influence of the implicate order, meaning the quantum vacuum underlying the material world). It is now being argued that even if everything has a cause, or may be many causes, it does not mean that all our acts and choices are predetermined by purely physical processes. This has been called hard determinism (Thronton, 1989).⁵⁴ The indeterminism seen at the quantum level, in a way, opens a possibility for creativity and free will. This would, however, mean pure chance, and as Pratt (1997)⁵⁵ has remarked that "our choices and actions 'pop-up' in a totally random manner, in which case they could hardly be said as our choices" (emphasis – randomness). This line of thought gives us room to return to Iqbal's notion of free will (*Reconstruction*)⁵⁶. We believe, as Iqbal argued, that there are subtler non-physical forces (ego, self, soul, consciousness) that guide our acts of free will. And what are those subtler forces? Certainly, the Directive Energy, which has provided freedom to the soul (ego, self, consciousness) as advocated by Iqbal. In fact, it is legitimate to state that no pre-determinism in any form is involved (see the Qur'anic verse 16: 33). In all this discussion, we have to assume on physiological and psychological grounds that soul (ego, self, consciousness) is a kind of non-material energy and is a part of universally penetrating Directive Energy. This has a nexus with oceans of quantum potential permeating the whole universe. Clearly then, like Iqbal (1930),⁵⁷ Eccles (1992)⁵⁸ and Watson (2005),⁵⁹ one cannot escape the conclusion that the soul is immortal and remains intact even after its separation from the body at the time of death.

Now, if we recognize the existence of a sub-physical quantum potential, which can influence every quantum event in this universe, then, it is not difficult to make a distinction

between serial time and Divine time. Serial time is a product of human mind appreciable by those inhabiting the planet earth. Einstein's relativity theory makes time the fourth dimension of space. This is a universally accepted proposition. But the time which is integrated with space is the serial time. What about the fact that quantum theory as well as relativity theory break down in areas underlying the known physical space? It has been argued, for instance, that "if two quantum systems interact and move apart, their behavior is correlated in a way that cannot be explained in terms of signals traveling between them at or slower than the speed of light. We are inclined to interpret this in terms of the universal networking of quantum potential (defined above) with the physical world, which may involve signals traveling faster than light (this has implications for Eccle's theory of psychons). It is here, in our opinion, that serial time ceases and Divine time starts. However, appreciation of Divine time can be realized only in a mystic state. By the same token Divine space can be visualized when we consider it in relation to non-local effects of soul (ego consciousness). We do agree that non-local effects occur instantaneously and it is difficult to verify them experimentally, though it can be experimentally falsified (Bohm and Hiley, 1993).⁶⁰ This has not been done so far. The following statement from the same workers is of significance:

"For if non-local connections are propagated not at infinite speeds but at speed greater than that of light through a quantum ether ... a sub quantum domain where current quantum theory and relativity theory break down ... then correlations predicted by quantum theory would vanish if measurements were made in periods shorter than those required for the transmission of quantum connections ... If super luminal interactions exist they would be non-local only in the sense of non-physical".

This takes us to the case of telepathy and clairvoyance (prophetic phenomena). They imply the applicability of non-locality. A number of investigations in this area suggest that non-locality is the only acceptable mechanism of instantaneous connectedness of the subject and the object in a mind-to-mind

transfer. This means that the information would be received exactly at the same time as it is generated, without undergoing any form of transmission. (It may be noted that neuron to neuron passage of stimulus has a delay time of 200 m seconds.) There is, however, one caveat in this scheme from the point of view of physicists. They can argue that information is basically a pattern of energy, which always takes time to travel from the source to the recipient location. This argument can be negated if one takes the case of extra sensory perception (ESP). It involves the use of subtler forms of energy (discussed above) which travel at super luminal speeds through supra physical realms (Pratt, 1987).⁶¹ The time period in such cases is of no consequence; nor can there be any attenuation as in the case of electromagnetic fields, which follow the inverse square law. We believe that during inner religious experience or even during prophetic revelation such subtler forces come into play, provided the mystic makes the necessary physiological preparation of disengaging himself from all sensory stimuli and focuses his full attention on to the infinite for seeking contact with Him. In such cases the period of contact will determine his ecstasy. Prolonged contacts may lead to such utterances as: "I am the creative truth (Mansur Hallaj)".

The phenomenon of micro-psychokinesis (m-pk) has recently been the subject of several studies. It is of interest to note that in m-pk consciousness is stated to influence directly the atomic particles (Boughton, 1996).⁶² This has been demonstrated experimentally when the shift of quantum events was observed (Boughton, 1991; Jahn and Dunne 1987).⁶³ This has been attributed to the collapse of wave function by consciousness. The problem of macro-psychokinesis (teleportation, levitation, poltergeist activity and materialization) has been studied extensively over the last 150 years (Inglis, 1984; Milton, 1994)^{64,65}. Yet, it remains a taboo area and therefore does not call for any further discussion.

We are aware that in developing our arguments in support of physical and psychological basis of religious experience, we

have leaned heavily on the possible existence of subtler planes for integrating the non-local transmission of information as proposed by Tilner (1993).⁶⁶ This, however, remains open to further investigation. Yet those who are involved in the study of matter are also on equally weak footing when they try to explain the nature of matter based on super string theory (hypothetical extra dimensions which are said to be curled up in an area of billion – trillion – trillionth of centimeter across and to which no access could be made). For this we may have yet to wait for another few decades. The controversies will however continue. There are some researchers who do not favor a-physical realms such as consciousness (ego, self, mind). This aspect has been dealt with in chapter 5 where we refer to the works of several reductionists (Crick, 1994; Hamerof, 1994; Sperry, 1994; Dennet, 1991);^{67,68,69,70} In spite of this, Mitchell (1995)⁷¹ believes that all psychic phenomena involve non-local resonance between the brain and quantum vacuum for transfer of information. Such considerations bridge the gap between physics and metaphysics, as was the hope of Iqbal. We have, to the extent of our reach, tried to put together current evidences from physics, biology and psychology in support of Iqbal's theme of inner religious experience. There are, however, two more theories, namely, of Eccles (1994)⁷² and of Watson (2005),⁷³ which have received substantial treatment in the chapter on biophysics of consciousness. We shall again take up these theories in tandem in order to seek further support for Iqbal's thesis on inner religious experience.

Eccles was in complete disagreement with the 'identity theory' which postulates that mental states are identical with physico-chemical states of the brain. While rejecting these theories he has argued that (a) it offers vague generalizations, (b) it promises that problem will be resolved when we have more complete scientific understanding of the brain in a period of another hundred years. This he calls 'promisery materialism', (c) it fails to account for the wonder and

mystery of the human self with its spiritual value, with his creativity and with his uniqueness for each of us (How the Self Controls the brain; pp: 33,176)⁷⁴ and (d) it allows no real scope for freedom. In brief Eccles in his theory of the self argued for non-material mind, which acts upon and is influenced by our material brains; there is a mental world in addition to physical world, and the two interact. However, Eccles rejects Cartesian dualism. A deep study of Iqbal demonstrates that he preempted the views expressed by Eccles in 1992 in his book: "How Self Controls the Brain". Eccles was a physicist of high repute. He received Nobel Prize for his work on 'Chemical Transmission of Message at the Nerve Synapse'. Like Iqbal, being a strong believer in spiritual self and material brain, he formulated the theory of 'psychons'. His hypothetical psychons were supposed to be associated with the nerve endings and mediated the reciprocal interaction of the material brain and the spiritual self. However, in order to place his psychons within the ambit of the worldview of physics, he assigned quantum probabilistic role to psychons. He conceived that the psychons have complete inner structure and are always accompanied by quantum wave fields, which, as we understand today, are not only acted upon by electromagnetic forces but also by subtler forces (discussed earlier). The influence of psychons on nerve endings as proposed by Eccles (acting as quantum fields) also provided support to the notion that the strength of the message varied with the strength of the quantum potential and thus opened the way for interpreting the neural code, though this remains elusive so far. Whatever the merit of this theory, there is one difficulty, which has been repeatedly pointed out by his critics. For example, Pratt (1995),⁷⁵ generally agreeing with the basic arguments of this theory expressed skepticism about Eccles acceptance of the standard interpretation of the conservation of energy. Further, if interaction between brain and mind is conceived as flow of information, then, how can it be explained without involving energy? In his opinion these two aspects actually limit his

theory. This criticism can be overcome by resorting to subtler, etheric type of force or energy acting at the quantum and sub-quantum levels (this has already been discussed in previous section of this chapter). Perhaps Eccles argument that "more direct action of the will precludes conservation law" may help meet this criticism. Even then, what about Para psychological phenomena? In conclusion, one can state that the scheme of events proposed by Eccles and Popper (1972)⁷⁶ and Eccles (1992)⁷⁷ about the characteristics of the soul (ego, self) formulated by them fits neatly into the meta-physical scheme proposed by Iqbal seventy years ago in the *Reconstruction*. It is worth noting, however, that both the schemes are upgraded when examined in the light of quantum potential operating at levels below the known physical structures (Bohm, 1994).⁷⁸ In view of these studies, we continue to maintain that soul (ego, self, consciousness) is non-material and immortal by design (as we have argued elsewhere as well) and is an extension of the transcendental energy permeating all kinds of matter, living or non-living. The linkage of soul with Directive Energy should leave no doubt about its immortal nature. In as much as its freedom is concerned, this is implied, in a way, in Hisenberg's Principle.

Any discussion about consciousness (ego, self, mind) would be incomplete if a reference is not made to the theory of Enformed Systems (TES) proposed by Watson (1997, 1998);^{79,80,81,82} Watson *et. al.*(1998,1999); and Watson and Williams (2003)⁸³. Major features of this theory have already been presented in chapter-5. Here, we will focus only on those ramifications of this theory, which are of significance for our theme of inner religious experience. This innovative theory stands in contrast to both, monistic materialism and reductionism. Indeed, there are several features of the theory, which can be accepted, of course, with a few reservations.

First, Enformism is a set of concepts that are based on the premise that organization is fundamental to everything including matter and spirit. Accordingly, Enformism means the inherent capacity of the whole system to organize. This is

claimed to be a non-material, pre-physical property ingrained in all physical systems, living as well as non-living, when considered in wholes and not in parts of the whole. The sentient organization stands in contrast to the well-known physical principle of entropy (Watson 1997,1998).^{84,85} Interestingly enough, hypothetical Maxwell's Demon is said to operate in case of a mixture of gas particles at various levels of energy, enclosed in the system, which rather than mixing up, as expected, randomly forms a gradient of energy. This phenomenon, unexplainable through the laws of physics lends support to the principle of inherent self-organization postulated under TES. Nowhere else is this principle more relevant than in living systems. An organism coming into existence following the development of a fertilized ovum through successive stages of transformation under the spell of pre-physical phenomenon (what Iqbal calls coming together of sub-egos), is not subject to laws of entropy. Why? Because as the physicists say the entropy of the world is increasing. Here in mother's womb or a bird's egg, within a restricted cosmos, with every growth cycle, if anything, the entropy is decreasing. Obviously, then, one can infer that the implicate force, which drives the process is universal in nature and can be well designated as a process of Enformy. This eliminates both monistic materialism and reductionism, though the same may play a role in living organisms in periods of sensibility.

Second, commenting on Eccles theory of psychons, Watson uses the acronym- SELF- meaning Singular Enformed Living Fields as a replacement of psychons to solve the binding problem between, 'self' (of Eccles and Iqbal) and the brain. From spiritualistic point of view we find great merit in this approach, since it eliminates the presence of entities in the form of psychons. Now does it require a quantum physical support to explain the behavior of psychons? The most interesting part of the SELF lies in the fact that it itself behaves like a field, without having physical existence as ordinarily conceived.

Third, the Enformed systems according to TES have a collective memory gained from experiences ordinarily in serial time. This collection of experiences prepares the consciousness (ego, self, soul) to exercise its influence on the body in periods of sensation, thus regulating efferent activity of the brain when it is receiving sensory stimulations. On the contrary the same system behaves differently in the event of a mystic state, when the subject is cut off from all sensory stimulations (a period of stillness identified by Iqbal, 1930⁸⁶; Forman, 2000⁸⁷). Accordingly, the SELF of Watson, it can be easily argued, leads the mystic to a spell of unitary experience, fully concentrating on the Infinite, and thus navigating him to the Divine environment of space and time. The time being non-serial, and space not representing the Newtonian space. This, we believe, is a period of illumination, which we are inclined to attribute to hypothetical particles, the luminons to replace the psychons. Indeed, there are indications of the transfer of non-local information having nexus with quantum potentials at the sub-physical level. In our opinion this is the only way to accept the validity of TES in spiritual terms.

Fourth, it is unfortunate that intellectual of Watson's caliber takes us to the non-spiritual arena when he uses TES to disapprove the existence of a Creator. We may call this non-material agnosticism or more appropriately spiritual agnosticism. The line of argument he uses is more semantic than realistic. For instance, he makes a rather erroneous distinction between the words, 'creating' and 'Creator', the former he interprets as a process, and the later as an entity. According to him the word process is sufficient to describe all natural phenomena including organic evolution, thus, precluding the need for a Creator. The difficulty with Watson is that unlike Pratt (2003)⁸⁸ he has not given thought to implicate order in the vast oceans of energy below the sub-physical world, which we have related to the Directive Energy as proposed by Iqbal (1930)⁸⁹. Nor has he been able to speculate on the physiological state of mind of a mystic in periods of absolute calm and stillness. Disagreeing with

Watson's negation of the Creator, we would like to emphasize the distinction which Iqbal has drawn between *Khalq* (Creation) and *Amr* (Direction) details of which have already been discussed elsewhere in this book.

In essence, then, without prejudice to the authenticity of science and religion, we have made an attempt to reinforce Iqbal's metaphysical approaches with fresh evidences drawn from the worldviews of science and religion.

Yet this is not all. The more we study Iqbal the more we realize that Iqbal neither subscribes to monistic materialism nor to classical dualism. He was a proponent of the unity of life. As such, we intend to explore further those aspects of our unified theory which can be assigned to Iqbal's vision of holistic experience and which could find universal acceptance by students of meta-physics (within the ambit of the expanded world view of Islam) and those relying on the infallibility of quantum physics. This is discussed in the following paragraphs.

For physicists, whether reductionists or dualists, quantum physics is so sacrosanct that it enjoys a focal position for all sources of knowledge related in one form or the other with the material world. There is nothing wrong about it. Yet, in recent times, students, in particular of particle physics have pointed out a number of caveats in the theory. Foremost amongst them are Bhom (1935), Neumann (1955), and Stapp (1973, 1993, 1999, 2001). Stapp, a particle physicist, at Lawrence Berkley National Laboratory, University of California, has developed interesting ideas about the "Quantum Theory and the Role of Mind in Nature". In his article-"The Hard Problem: A Quantum Approach" he concedes that "all our behavior and all of internal processing that occurs in the bodies could be deduced, at least in principle, from classical mechanics and appropriate boundary conditions". Yet, he is not convinced that classical mechanics can find a suitable solution for experience, that is, streams of consciousness that constitute the selves. The same ambiguity confronted Iqbal when he turned to Newtonian physics or

relativity (classical physics) and even Heisenberg's wave function. Nor was Iqbal able to extract beingness and consciousness from classical physics. This meant that there remained incompleteness in dealing with the full description of nature. To understand where does the incompleteness of quantum theory lie, we examine how Stapp approaches the problem vis-à-vis that proposed by the Copenhagen group (Bohr, Dirac and Heisenberg).

According to Newton's theory every part of the universe is instantly linked, causally, to every other part of the universe (for example, if a person were to kick a stone, and send it flying off in some direction, every particle in the entire universe would immediately begin to feel the effect of the kick). This idea is mind-boggling. However, relativity theory of Einstein, banished it from classical physics. It resurfaced with quantum theory. Whereas Einstein objected to this, Bohr, the proponent of quantum theory, defended the same. This resulted in renunciation of classical idea of causality, and revision of our attitude towards the problem of physical reality. This is what Iqbal calls the revolt of physics against its own foundations. This was however, not to be the case. The rise of new physics (quantum theory) was a natural imperative of intellectual manifestations, since the classical theories of Newton and Einstein did not take into account the role of experience and consciousness in understanding the reality of nature around us.

To overcome this difficulty Bohr introduced the idea of observer in the quantum theory. He claimed, "quantum theory, regarded as a theory about human knowledge, is a complete description of physical reality". Yet, Einstein was not convinced and remarked, "What I dislike about this kind of argument is the basic positivistic attitude, which from my view is untenable and seems to me to come to the same thing as Berkley's principle, *esse est principii* (to be is to be perceived)". In recent years Gell-Mann (op. cit.) has expressed similar views. He believes that "in order to understand the evolutionary process of living organisms one

needs to have a coherent theory of the quantum mechanical reality in which these organisms are imbedded". It is precisely because of these difficulties that Stapp (1991,2001) started a search for a complete quantum theory keeping in view the concept of non-locality (quantum theory is non-local; Tittle, *et al*, 1988). Of course, Stapp's major concern has been to bring human experience and consciousness into our understanding of reality. While articulating his views in quest for a complete theory, he critically examines the inadequacies in the Copenhagen model of quantum theory. In his view, the theory is "only a halfway house: it brings in human experience, but at the stiff price of excluding the rest of reality". His major objection lies in the fact that if the theory was to present the whole science, how should it be possible to "leave out the physical world". It is agreed that we can never know for sure that any proposed theory of the world around us is true. Yet, there is no reason that "one should not attempt formulating a coherent idea of what the world could be and the rules by which it could work". His main argument rejecting the Copenhagen model revolves around the concept of non-locality for which he cites the photon experiments. A pair of photons was sent in two different directions ten miles apart along optical fibers. The two particles reached their destinations at the same time. Experiments were performed on each of them separately. The observed connections between the outcomes of these experiments clearly defied the nature of the physical world based on directly observable objects ;(physical letters 1).

Given this introduction, we now pass on to the specific analysis of quantum theory undertaken by Stapp (1991, 1996, 2001). His arguments run like this: **First**, quantum theory according to the (Orthodox, Copenhagen) interpretation, involves a huge conceptual shift from the classical ideal; it brings experiences of observers into the physical theory. In as much as the observer is concerned, his experience of observing the data emerging from the system, at best, remains subjective. Bohr, himself stated that "In our description of

nature the purpose is not to disclose the real essences of phenomena but only to track down as far as possible relation between the multifold aspects of experience" (Bohr, 1934). **Second**, in accepting this interpretation we only offer rules of calculation for the deduction pertaining to observations obtained under well defined conditions specified by classical mechanical concepts (Bohr, 1958; Stapp, 1993). **Third**, in contrast to classical mechanics human experiences occupy a basic primitive place in quantum mechanics, notwithstanding the fact that rules of calculations pertaining to these experiences enable us only to look for matter like properties that occur in classical mechanics. The mathematical rules are therefore only generalizations of those used in classical mechanics. **Fourth**, Einstein thought that physics is an attempt to conceptually grasp reality as it is thought independently being observed. This may be true; however, the introduction of experiences into atomic physics is not only accepted by the scientific community but is considered as the correct way of comprehending atomic phenomena. **Fifth**, the crux of the problem is that "the quantum state and the form of our experience (limited to observer in the Copenhagen model) represent not the full reality itself but rather the probabilities for our perceptions to be various possible specified perceptions". **Sixth**, using this line of argument Stapp concludes that "*in the context of mind / brain problem the most orthodox interpretation of quantum theory brings the experiences of the human observers into the basic physical theory on at least a co equal basis with the physical or matter like aspects of description: and it thus gives only half of the dynamical and ontological story*". From this critique of orthodox quantum theory, Stapp, proceeds to analyse the ontological basis of the theory as proposed by Bohm (1984), Heisenberg (1976), Neumann (1952).

As early as 1952, Bohm postulated that real ontological basis for quantum theory can be realized only by segregating the 'particle' and wave function as proposed by Heisenberg. He suggested that particle rides like a surfer on the wave. In

this theory one finds a huge gap between the information contained in the wave and information contained in our experience. In physical jargon both waves and particles may be considered as material. Yet, wave describes all the possibilities for what our actual experience might be. This means that the waves represent potential beingness. On the other hand, the path of surfer specifies the actual choice from amongst the various possibilities. This represents the actuality of beingness of the particle. Accordingly, as Stapp writes "the wave generates all the possible experiences; whereas, trajectory defined by the surfer specifies which of the possible experiences actually occurs". Furthermore, Bohm's model does not account for the empty branches which form the part of the Heisenberg model, though Heisenberg proposes a sudden change which causes collapse of the wave function to differentiate between actual events and objective tendencies. At best, Bohm's surfer represents only the actual event. The major problem with the Heisenberg theory however, is to find a reasonable criterion for the occurrence of these actual events.

After having examined the difficulties in the interpretation of Bohr (op. cit.) and that of Heisenberg (op. cit.), Stapp proceeds to re-examine the quantum theory in the light of a dramatically different perspective presented by Neumann (1952). He finds merit in Neumann's suggestion that "*there is nothing in the purely material aspects of nature that singles out where the actual events occur... these events occur where consciousness enters, that is, in conjunction with conscious event?*". This approach which includes consciousness gives complete 'ontologicalization' to the Copenhagen interpretation. In this way, the subjective Copenhagen interpretation is transformed into objective reality. Stapp reinforces this argument by citing the example of 'survival of the species' in which actual events occur in the human brain under the spell of consciousness. It is important to note that in the Von-Neumann scheme there is no sudden collapse of wave function (as proposed by Heisenberg). All the wave branches continue to exist thereby allowing the streams

of consciousness to perpetuate. In fact, each different branch does not affect the other accompanying branches, therefore, each wave can be considered as a different 'self' or 'psyche'.

In essence, all that we have stated so far means: (a) that classical mechanics is unable to give a rationally coherent description of the world itself. The classical principles are simply too impoverished to serve as a basis for description of all of nature including the felt experiences (for example pain etc). Nor do the principles of classical mechanics explain the property of the materials from which the living brains are made. (b) The introduction of quantum mechanics gave a new impetus to our understanding of reality by introducing the concept of observer. Even this has been identified as controversial because of the subjectivity involved. (c) All alternate explanations which do not include experiences and consciousness have the same shortcomings. (d) The mathematical rules introduced for calculating the probabilities of actuality of events to occur are mere expectations pertaining to these experiences. (e) The wave function as proposed is the quantum analog of the corresponding classical equation of motion. The part dealing with mind enters into the scheme only to the extent that it may pick out 'reality' from an enormous mass of potentialities. (f) Consciousness of self involves streams of thought. Each part of which can remember those events that went before (note that memory of past events resides in consciousness). When an event is to take place, all past experiences are recalled. And only that event which is actualized to occur is realized by collapse of other wave functions; the collapse of waves is, as suggested, caused by consciousness. One can say that "each conscious event is a new entity that arises from the ashes of the old".

This brings the updated interpretation of quantum theory closest to Iqbal's vision of consciousness (ego). The above discussion leads us to suggest that quantum theory itself is converted from a 'half house' (as proposed by the Copenhagen group) to 'full-house' (completeness) when

consciousness is injected into the particle-wave as has been repeatedly proposed. For us in terms of unified theory it would mean that neither dualism nor monistic materialism provides a full explanation for the role of consciousness (self) neither in verifiable experience nor in inner religious experience. Iqbal's thesis on the subject in the *Reconstruction* points in same direction.

In support of the updated version of quantum theory, Pauli's remarks are worth consideration – "element of pure chance to embark on ontological discussion of the cause of the actualization entails assuming that the element of pure chance that occurs in contemporary quantum theory is merely a mass of ignorance of the true cause, which must necessarily be highly non local (Mermin, 1994)". The only way to locate the cause lies in the fact that actualizations must come from the experiential aspect of things. In the same vein Arthur Eddington observed: "the quantum world is more like a 'giant mind' than like the 'giant machine' described by classical mechanics. For, the evolving state represents vector not 'substance', but rather a 'probability' for something to happen, and probability is normally considered to be a subjective or mental sort of thing, not a material reality. The second part of quantum reality is the 'actual' event, which Heisenberg contrasts with the 'potentia' from which the event arises. The 'actual' specifies what is able to be experienced: only the actualized branches can be experienced. This connection of the actual to experience is strengthened by the Wigner-von-Neumann proposal, which is essentially to *identify* the actual with experience."

All that we have stated about the relationship of consciousness and quantum theory (Stapp's version) has important bearing on Iqbal's vision of 'inner religious experience'. For the first time in the history of physics Von-Neumann – Stapp inclusion of consciousness in the quantum theory opens the way for interpreting Iqbal's consciousness-ego scheme accommodating to the possible extent the view point of quantum physicists. It is becoming increasingly

obvious from the recent works of particle physicists like Bohm, Von-Neumann and Stapp (op. cit) that (a) consciousness (ego, mind) is a non material entity, (b) like the self it controls the brain (see also Eccles, (1994), (c) whereas, Stapp's work is an attempt to develop a complete quantum theory, yet, it remains confined to the understanding of the physical reality of the world but does not include the genesis of mystic experience. Agreeing with Iqbal we postulate that experiences whether verifiable (normal) or non-verifiable (inner religious experience) are holistic and subject to same parameters as identified for a complete quantum theory. This, in our opinion, as Iqbal has stated, brings science and philosophy closer together. In terms of unified theory which we are proposing, it can be gain said that neither dualism nor monistic materialism provides complete answer for interpreting inner religious experience. What then should be the answer?, For this we are proposing that explaining all types of experiences, the only holistic approach lies in introducing the concept of **monistic spiritualism**. This fits into the scheme of Iqbal when all his views as expressed in the *Reconstruction* are related to major advances made in the field of particle physics and thus in the updated quantum theory. The accompanying diagram summarizes our concept of unified theory (monistic spiritualism) in the light of Iqbal's views supported by recent researches.

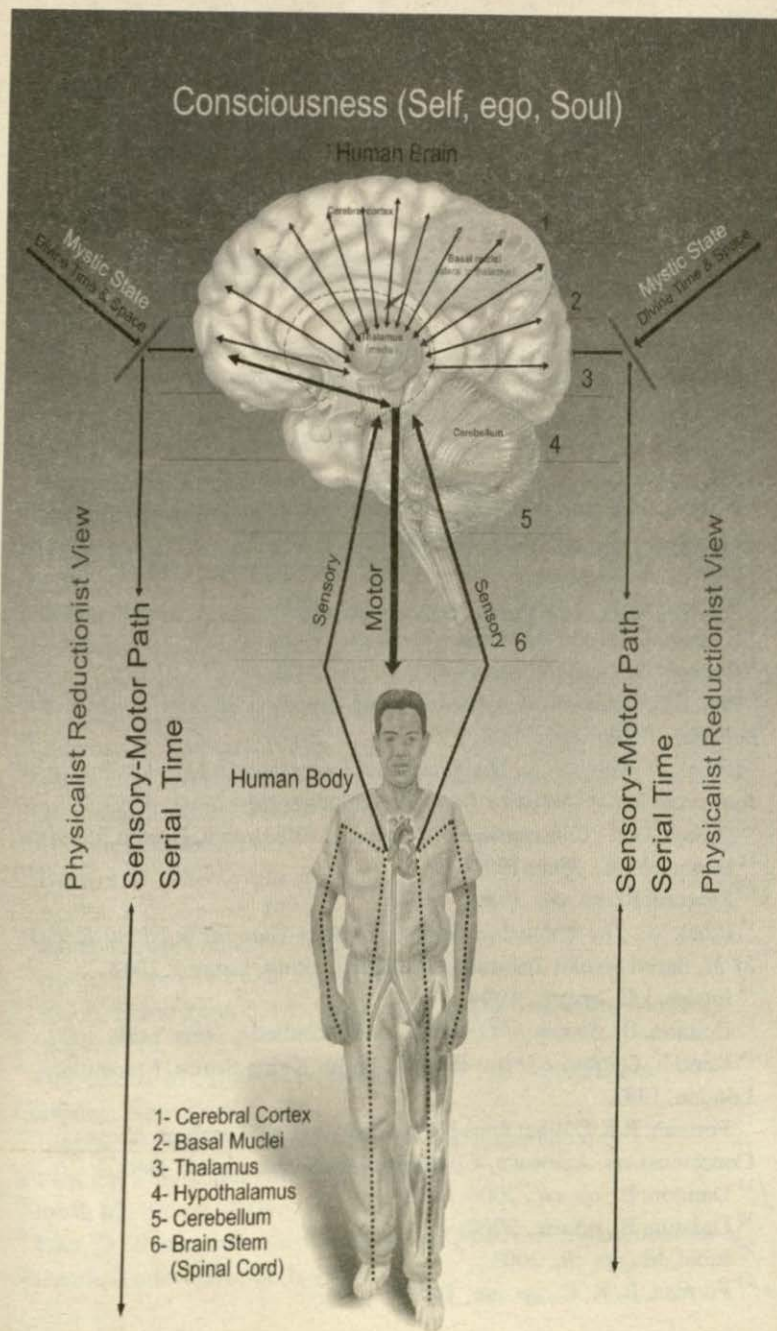
To close this chapter it would be appropriate to present a summary of the views expressed in various sections of this book. **First**, we maintain with Iqbal the non-materiality and immortality of ego (Soul, Consciousness, Self); meaning thereby that there is no spiritual death. **Second**, ample evidence has been provided for the freedom of ego as a modicum of transcendental emanation of Directive energy which permeates all living and non-living matter and was in place even prior to the big bang. For this we have relied heavily on new physical approaches, for instance the existence of sub-physical oceans of energy (10^{108} J/ cm^3),

which is not subject to Heisenberg's principle of uncertainty, nor to Einstein's relativity paradigm. The nexus between sub-physical energy and Directive energy has been postulated, yet much more is required to be discovered about its influence on non-local phenomenon witnessed in psycho-kinesis, that is, passage of thought from one human to another or even to other living organisms. Such evidences from the sub-physical world do have implications for the separation of serial time and space from Divine time and space, as well as for the non-physical ego (Soul, Consciousness, Self), endowed with property of non-local influence on the brain. **Third**, on the Biological side we have further strengthened Iqbal's concept of creative evolution under the spell of Directive energy, inherent in the principle of "ontogeny repeats phylogeny" or in the structure and function of DNA, and ancient memory of antibodies. **Fourth**, Inner religious experience whether taken subjectively or objectively clearly stands on the same legitimate grounds as the normal experience (verifiable). Thus, unlike Kant, it can now be argued that what cannot be observed or measured does not mean that it does not exist. This aspect receives support from such examples as the theoretical existence of quarks and even gluons. **Fifth**, the viewpoint of reductionists that every act, including consciousness (Ego, Self, Soul), can be explained through a process of reduction of physical structures of the brain, has been shown to have little relevance. Balance of evidence indicates that monistic materialism is not a theory of choice in as much as mind-body relationship is concerned. Same is true of dualism in the form put up by Descartes. Certainly, the concepts of Popper, Eccles and Iqbal are more germane to the validity of mind-body problem. Similarly, Watson's theory of Enformy provides high support for the existence of consciousness (Ego, Self); as a non-physical entity, (provided that its agnostic spiritualism is held back). **Sixth**, There is abundant direct evidence that brain in company with consciousness plays a dominant role in the activity of the body through the thalamus, cortex and more importantly the

PIMs, when sensory-motor pathways are in operation. **Seventh**, it is hypothesized that in mystic states when the subject is in a period of stillness (a period in which sensory-motor activity is suppressed), consciousness plays its unique role, elevating the mystic into Divine time and space under unitary experience for contact with the Infinite. **Finally**, our analysis undertaken so far assigns a dual role to consciousness (Ego, Self) integrating sensory-motor stimuli on the one hand and performing a unique role in the mystic state under the spell of Directive energy on the other hand as is hypothetically imaged in 7.2.

Legend to figure 7.2. The picture is imaginary and depicts the relationship of human consciousness in two modes. In mode A consciousness regulates the activity of the brain in sensory-motor responses. In mode B, for example, during inner religious experience (mystic state) when all motor sensory stimuli are eliminated, higher consciousness comes into play and the state of the mind is elevated to Divine time Divine Space. This is a possible period of contact between the finite and the infinite. Note the flow of sensory and motor messages during the activity of the brain in periods when normal verifiable experience is operative. Note also that in mode B the level of experience is different. Yet the picture reflects the holistic experience repeatedly emphasized by Iqbal in the *Reconstruction*. Evidences for the scheme are discussed in the various chapters of the book and summarized in chapter 7.

Figure 7.2



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