



ISLAM and SCIENCE

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INTRODUCTION

Science is the knowledge of nature acquired as a result of its careful and accurate observation. It is now well-known, thanks to the writings of *Briffault* and *Sarton*, that it was the Muslims who invented the scientific method and Christendom only built upon the foundations of modern science laid by the Muslims in response to the call of the Holy Quran which enjoins upon the believers to observe and study nature in order to acquire a more and more intimate knowledge of God. Is it not strange then that a people who laid the foundations of science for no reason other than this that they wanted to understand, explain and elaborate the idea of God more and more thoroughly by observing and studying His handiwork in the form of nature, should today ask the question : "Where does the idea of God come into science"? This question arises in our minds today because, having imitated and followed blindly the western Godless attitude towards nature for centuries, it has become a deep-rooted habit with us now to look upon the knowledge of natural phenomena, called science, as having nothing to do with God. Our condition appears to be like that of a caged bird which has become accustomed to captivity long enough to regard it as a natural and normal situation and tends to return to the cage even when set free.

As a matter of fact the idea of God is not only compatible with science but also inseparable from it. Science as a human activity cannot do without some metaphysical or philosophical basis. The moment we separate it from the idea of God, which is its true and natural philosophical basis, we are forced to give it a wrong basis instead—a basis which is out of harmony with its nature—whether we know it or not. And it is evident that a wrong basis of science must hamper its growth sooner or later

in one or another of its aspects, especially in its indispensable theories and interpretations relating to the biological and psychological domains of nature. The reason is that, as an activity which has for its object the search for truth, it must come into a clash with its own wrong philosophical basis at some stage of its development and must yield to it unconsciously at the cost of its own validity. No system of science can cross the limits which have been prescribed for it by its own fundamental hypothesis. A Godless science cannot, for this reason, come to the conclusion that God is the reality of the world, no matter how strong may be the indications in favour of such a conclusion. Hence we cannot separate the idea of God from science, without doing violence to the latter, without twisting it unconsciously more or less and without depriving it of much of its meaningfulness and interests. Unfortunately, we have yet to realize that our choice is not between having and not having a philosophical basis of science but between having a wrong philosophical basis of it and a right one. For, although a system of science may claim to be without any philosophical basis, it has yet a philosophy and a view of Reality at the back of it.

What makes science possible is the existence of order in natural phenomena which remains the same always and everywhere in nature and the role of the scientist is no more than to discover that order by means of his observations and to record the ever-growing knowledge of its details and levels. Indeed, scientific activity starts with and is prompted by the assumption that there is an order in nature which breaks nowhere. If order cannot be discovered in any direction, scientific activity must stop in that direction having met with failure. Thus we find that at the *physical plane of nature* there is order in the atom, in the molecule, in the crystal, in the snow-flake and in the shapes, motions and systems of heavenly bodies. The order to be found in the physical phenomena of nature is so constant and so exact that it can be always expressed mathematically. Even the growing speed of a pebble thrown from the top of a house and the expansion of a bar of iron with heat, follow exact

mathematical laws which were in force in the Universe long before any human mathematicians, in fact any human beings, were in existence. Matter is, in modern physics, destructible and when it is shredded away what remains of the physical phenomena of nature is only structure and relations which can be expressed in terms of mathematics. Order, infallible mathematical order, is thus the essence of the material phenomena of nature. It is this order that has given rise to all the physical sciences and made possible their technological application.

Now, order is a very dependable sign of the activity of a mind. If we see a few dozens of red beans lying somewhere on a foot-path we may think that they have fallen accidentally from someone carrying a load of beans. If, however, we find the same beans arranged in the form of a mathematical figure, say a regular hexagonal pattern, we cannot but conclude that a mind has been at work here and that every bean has taken its place in the pattern according to the purpose before that mind. Thus, wherever there is order in nature, purpose also must be there. Again, order is no order if it is not perfect and free from loopholes and discrepancies and the achievement of perfection is a gradual process. This means that the presence of order in the phenomena of nature indicates not only that it is the result of the activity of a mind but also that that activity is purposive and creative, imbued with a desire for perfection and expressing itself in the shape of a process of gradual evolution of the created object.

The activity of a mind—it must be, of course, a world-mind—with all its characteristics of creativity, purposiveness, desire for a state of perfection and a gradual evolution towards that state, becomes still more apparent at the *biological plane of nature*. The evidence of it is available in the perfect internal order, system, design, plan, organization, orchestration, wholeness, unity and uniformity to be observed in a living organism even if it may be as small as a single cell. Each of the inner physiological functions of an animal *e.g.* digestion, biochemistry of metabolism, the industry of hormones and vitamins, blood

circulation, respiration, procreation, automatic physical growth into a pre-determined form, spontaneous activity of its vital organs, healing of injuries and health restoring reaction to diseases, indicate the masterly control and direction of a mind other than that of the animal itself. Again there is a perfect harmony, integration and co-ordination among these functions and between them and the external instinctive behaviour of the animal for the achievement of a single common purpose which is the maintenance of its life and race.

The purposive and creative activity of a world-mind is also in evidence in the wonderful adaptation of animals to their surroundings. A fish which has to swim in water has gills for water-breathing and a streamlined body with a propeller at the end and oars at the sides. A bird which has to fly has an intricately planned system of feathers adapted for flight, air sacs and hollow bones filled with warm gas to give it buoyancy. Adaptation is indeed a character of all living things and is shown by some of the smallest details of their physiology and instinctive activity. The eye and the ear are miracles of the creative and purposive activity of a mind. Evolution of life from a one-cell animal to man, which is a clear indication of persistent progress towards a cherished goal, is unthinkable without the purposive and directive activity of a mind. It is the existence of order, purpose and plan in the natural phenomena of the biological world that has made all the biological sciences possible.

When we come from the biological to the *psychological* or *ideological plane of nature* we find order and purpose with all their implications of creativity, the desire for perfection and gradual evolution becoming still more apparent. The only actor on the stage of the ideological plane of nature is the human mind with its manifestations in the form of human activities. The human mind has certain natural characteristics in the form of innate desires, which give rise to all human activities. The human mind and its activities are, therefore, as much a part of nature as anything else. We find that, as a natural phenomenon,

the human mind is not a confused mass of innate desires but all its desires are ordered and organized around a single desire which rules and controls all the rest, even those which have their source in the animal instincts of man. This desire is man's urge for beauty and perfection which can be perfectly satisfied only by an ideal of the highest beauty and perfection and that ideal can be no other than God. In this desire of man, therefore, the urge for perfection in the universe which was so far manifesting itself for the perfection of the physical and biological phenomena of nature has come to its own and seeks its full and direct expression and satisfaction through the conscious activity of man for the realization of an ideal of the highest perfection. However, different men interpret this urge of their nature differently according to their judgment of the meaning of perfection with the result that it expresses itself in a number of different, imperfect ideals to which they unconsciously and erroneously attribute the qualities of God.

Every ideal becomes an ideology in the course of its practical application to human life and creates an ideological community having its educational, ethical, economic, intellectual and legal systems suited to its own ideal. This gives rise to a variety of conflicting ideological communities each of which arises, prospers, reaches the apex of its glory and then declines and disappears and another ideological community arises to take its place. This process of ideological evolution is leading to the emergence of a world ideological community based on the perfect ideal—which is God—and hence capable of enduring for ever. It is the urge for an ideal in man which organizes his personality, motivates all his activities and represents the order and purpose created by the world-mind at the human level of nature. It is this urge alone, therefore, that can be the true basis of all the human and social sciences such as the philosophy of history, the philosophy of ethics, the philosophy of economics, the philosophy of law, the philosophy of education and individual and social psychology etc.

In brief, the activity of a mind in nature is manifested in the facts of order, system, design, plan, proportion, symmetry, wholeness, unity, uniformity, organization, orchestration, co-ordination, adaptation, mathematical thought, evolutionary, drive towards stages of higher and higher biological perfection, the procreation of individuals of their own type by the animals, their automatic recovery from illness and injury, the organization and unity of the human personality, the human urge for ideals of beauty and perfection and the evolution of ideological communities.

Thus, by seeking and finding the existence of order and purpose in nature, science itself raises the question: "Whose mind is there at work in every little detail of nature?" The Holy Quran answers this question by saying, "It is the mind of Allah". After drawing attention to the activity of a mind manifest in a few natural phenomena, the Holy Quran warns mankind: "This is Allah! Where do ye go in misguidance?" (6: 98). The Holy Quran describes the phenomena of nature as "signs of God" because they indicate the activity of a mind with all its characteristics of purposiveness, creativity, the desire for perfection and gradual evolution of the created object, and this mind can be no other than the Mind of God. "Verily, there are in all things created by God in the heavens and the earth and in the alternation of day and night, signs for the wise" (3: 190).

Again by assuming and discovering that the order in nature is uniform and constant, science raises the question: "Why is the order in nature the same always and everywhere?" The Holy Quran answers this question by saying "Because it is the outcome of the single purpose of a single Creator". "If there had been in the heavens and the earth other creators besides God, then heavens and the earth would have fallen into a disorder" (22: 21)

Science must, therefore, take from the Holy Quran the concept of God as an explanation of its very foundation, namely, the presence of a uniform order in nature. It is only in this way that it can acquire its own completeness and coherence

and become fully interesting and meaningful. *Such a step will not be an innovation in science which is always incorporating into itself facts which are not known by direct observation, but which are in the form of hypotheses which explain and impart meaning and coherence to a number of facts known by direct observation.* An idea which finds its place in science in this way and continues to be supported by new observations acquires itself the status of a scientific fact and becomes an inseparable part of science. Since the fact of order, and consequently the idea of God as its explanation, will continue to be supported more and more by new observations, the idea of God will acquire, more and more securely, the status of a scientific fact and become increasingly an irresistible force in the world. Indeed, the object of the Holy Quran in calling upon human beings to observe and study the phenomena of nature in the light of the belief that they are the creation of God is, that, by doing so, their belief will be verified and strengthened by the conclusions of their observations and will turn into a firm and unconquerable conviction. We have to avail of this guidance of the Holy Quran in order to turn our own belief in God and that of others into such an unshakable conviction.

(1)

What is known as Science is only another name for the knowledge of the observed universe which includes matter, life and mind. The key to scientific knowledge is the *observation of nature* which we carry out with the help of our five senses. The scientist observes natural phenomena and then draws as carefully as possible certain inferences from his observations, verifies his inferences by further observations and arranges his inferences in a rational order. Every correct inference of a scientist is considered to be a scientific fact and to represent a law of nature. The systematized and ordered collection of inferences drawn from the observation of nature is known as Science.

Sometimes the scientist studies nature as it is directly and for this purpose brings himself close to natural phenomena for their proper observation. At other times he plans the occurrence of natural phenomena in his laboratory for the purpose of their satisfactory observation and thus brings them close to himself. But whether he brings himself close to natural phenomena or brings natural phenomena close to himself, his object in each case is to create facilities for himself for their proper observation. This activity of the scientist is known as experiment. Experiment is thus only a device to facilitate the observation of nature, and verification is the renewal of observation for the sake of a greater certainty.

This method of investigation employed by a scientist, which is based entirely on the observation of nature, is known as the Scientific Method. It will appear from its description given above that it has five main steps or stages :—

- (1) Experiment.
- (2) Observation.
- (3) Inference.
- (4) Verification.
- (5) Systematization of inferences.

Scientific facts are not always the result of direct observation.

Sometimes a number of facts discovered by a scientist are explained by a hypothesis or assumption which gives them a unity, a system and an order. This hypothesis is, therefore, believed by the scientist to be true. Hence, as long as it is not disproved by the discovery of other scientific facts, it has all the importance and status of a scientific fact, although it is not a direct inference from observation. Thus the scientist endeavours to explain, order, and systematize scientific facts by means of theories, wherever necessary or possible and such theories constitute an indispensable part of Science. The scientists, therefore agree that there are two kinds of scientific facts :—

- (1) Facts which are known-as a direct result of observation.
- (2) Facts which take the form of assumptions which explain or order a number of different facts known as a direct result of observation.

An example of this second variety of scientific facts is the atom all the existing knowledge of which has been acquired by the scientists by observing its effects or results but without observing it directly.

The universe has three distinct levels one above the other. The lowest level of the universe is the world of matter. Above that level there is the world of life and the highest level of the universe is the world of the human mind and its activities. Corresponding to these three levels of creation, Science or Knowledge of the Universe has also three levels :—

- (1) At the lowest level of scientific knowledge are the Sciences of Matter or the Physical Sciences which include Physics, Chemistry, Astronomy, Geology, etc. Mathematics is the science of the relation of physical objects expressed in terms of symbols. It must be therefore included in Physics.
- (2) Above this level there are the Sciences of Life or the Biological Sciences which include Botany, Zoology, Embryology.

- (3) At the highest level of scientific knowledge we have the Science of the Human Mind and its activities. These are known as the Psychological or the Human Sciences and include individual Psychology, Social Psychology, the Philosophy of History, the Philosophy of Politics, the Philosophy of Ethics, the Philosophy of Economics, the Philosophy of Law and the Philosophy of Education.

These three departments of Science are also described for the sake of brevity, as Physics, Biology and Psychology.

It is sometimes imagined that a scientist is not guided in his scientific investigation by any previous beliefs or convictions which he has not proved scientifically and that he accepts nothing which cannot be inferred from observation. This is not true. Every scientist starts with several pre-conceived ideas or beliefs (which he has not established scientifically) as the basis of his scientific inquiry and these pre-conceived ideas or beliefs influence his results. One of these pre-conceived ideas is that the universe is a whole or a unity and is not split up, from the point of view of either time or space, into a number of departments or regions in which the prevailing laws of nature are different. The laws of nature are uniform, permanent and immutable. They are not only the same everywhere but also the same at all times. This belief of the scientists is supposed by them to be valid and one indication of its possible validity is that it has not proved to be false at any time during hundreds of years of scientific research. However, it has not been established scientifically that it is valid for all times. But the scientist accepts its validity intuitively without caring to establish it. It is the cause of Science and not its result. It is the basis of all the progress of Science that has been hitherto possible. Indeed, if the scientists had not made this intuitive belief their starting point and if this belief had not been true, science would not have been possible. It is this belief that induces the scientist to embark on his scientific research and enables him to test the validity of his conclusions and to continue his research

with hope and confidence. It is the guiding light of his observations. Its silent testimony assures him of his success and shows him the paths of future inquiry. Evidently, if a scientist is made to believe that a scientific truth discovered by him as a result of his scientific research has only a temporary or local importance and that there can be now or in future several other scientific facts which are alternative or parallel to it (for example, if he is made to believe that water boils at the same height from sea-level at some places at 100°C and at other places at 50°C or at one time at 100°C and at other times at 60°C) he will not be interested any more in continuing his research.

Again a scientist believes on account of the same unity of the universe and without any scientific reason that scientific knowledge is a unity and that all true scientific facts whether they relate to the physical or the biological or the psychological level of existence are intellectually and rationally related to each other, support each other and throw light on each other and never contradict or oppose each other. It is on account of this belief that when a scientist discovers that his scientific investigation has revealed a truth which comes into conflict with a known and established scientific truth, he suspects the validity of his discovery or else suspects the validity of that established scientific truth and re-examines it with a view to discovering its possible falsity. It is because of the unity of scientific knowledge that when a part of Science develops in a wrong direction its misdevelopment has an adverse effect on the progress of all its other parts. The scientist believes, without any scientific reason, of course, but very rightly, that every scientific truth illuminates a number of other scientific truths and that, should he ignore or overlook any scientific truth, he will be *ipso facto* deprived of the knowledge of several other scientific truths and the progress of Science will be hampered and may cease altogether in many of its most important aspects.

It may be asked how is it that a scientist believes in the unity of the Universe and the unity of Science without being forced by any scientific reason to do so. The reason is that the

belief that the Reality of the universe is one and the entire universe its manifestation is ingrained in the very nature of man and the scientist cannot shed his nature as a human being. Ever since man has become conscious of himself and has started thinking about the world around him, he has had an intuitive conviction that although there is an innumerable variety of things in this world yet the reality of all these things is one. Men have, however, differed from time to time as regards the nature of the single reality that underlies all these things. One of the earliest Greek philosophers, for example, thought that this reality is water. Later on, another Greek philosopher imagined that the ultimate stuff of the world consists of indivisible particles of matter known as atoms. In modern times some thinkers came to the conclusion that the single basic reality of the world is material energy. Side by side with such speculations and guesses about the Nature of Reality there was one confident call, as old as the human race itself, that the reality of the world is not material but mental or spiritual and that it is God the All-knowing All-powerful Personality Who has created the world. This call was raised by thousands of inspired men or prophets throughout the ages in all parts of the world and in all communities of history. This is also the call of the last of the prophets Mohammad (peace be upon him) to whom the Holy Qur'an was revealed.

The scientist does not generally admit that he, as a scientist, believes in the unity of the world or the unity of the reality of the world because he is not conscious of his belief. Yet he acts according to it unconsciously under an irresistible urge of his nature. This belief is implied in his attitude towards nature and in his scientific inquiry. It is clear that unless one assumes, consciously or unconsciously, the unity of Reality one cannot believe either in the unity of the Universe or in the unity of Science. The reason is that the unity of diverse elements requires their organization and organization is impossible without an organizing principle. Again the principle that organises and unifies all scientific facts must be their ultimate basis or reality. Thus all

scientific facts must be intellectually consistent with the Reality of the Universe and must be relevant to its rational explanation. Indeed the mutual intellectual relationship of scientific facts which makes them a unity is the result of their direct intellectual relationship with a single Reality which is the 'reality of the Universe. A scientist's idea of Reality may be residing in his unconscious mind and he may not be aware of it but it never leaves him in the course of his scientific research and continues to influence his "scientific" conclusions.

Since scientific facts are consistent only with the true idea of Reality, it follows that if the scientist's idea of Reality is true his scientific research will be rightly directed and its results will be fully accurate, otherwise it will be wrongly directed and its results will not be entirely correct. The reason is that in the latter case he will unconsciously reject some of his true results as wrong, because they do not happen to accord with his wrong idea of Reality and will unconsciously accept some of his wrong results as true because they happen to accord with his wrong idea of Reality.

(2)

Philosophy offers a view of Reality and endeavours to show its consistency with all the scientific facts known and established by means of observation. The philosophers have had different ideas of the nature of Reality and naturally every philosopher has endeavoured to show that all scientific facts are consistent only with his own idea of Reality which is, therefore, the only idea of it that is correct. But since there can be only one idea of Reality that can unify all true scientific facts, there can be only one idea of Reality that is true. The view of the Western scientists of the non-Communist World that the nature of Reality can have no effect on the nature of the laws of nature which remain the same no matter what the nature of Reality may be is self-contradictory. How can the laws of nature as we understand them remain the same when our view of the nature of their Reality or Essence becomes different? On this

point the view of the Communists is more reasonable. The Communists believe that Reality is material and possesses dialectical properties. Hence they conclude rightly from this hypothesis that all scientific facts must be consistent with and must be illuminated by this idea of Reality and that a scientific conclusion which is inconsistent with this idea of Reality must be unscientific and wrong. Since every other idea of Reality must be wrong, to start with every other idea of Reality consciously or unconsciously must be harmful to the development of true Science. The Muslims believe on the other hand that the true idea of Reality is spiritual and that it is God Who is the Creator and Evolver of the Universe. Hence they are justified in concluding from this hypothesis that all scientific facts must be consistent with and must be illuminated by the idea of God as the Reality of the World and that a scientific conclusion which is inconsistent with this idea must be unscientific and wrong. Moreover, since every idea of Reality other than that of God must be wrong, to start with such an wrong idea of Reality must interfere with the development of Science.

According to the Muslims' idea of Reality the laws of nature represented by the facts of science are the creative deeds of God Who is a personality and we know that all the actions of a personality constitute a unified whole because they proceed from a single ultimate purpose or ideal. The actions of a human being also form a unity because a human individual is a personality and all his actions proceed from a single purpose which is the ideal of his life. Wherever there is a unified whole of activities a personality must be there. Since God Almighty has a purpose in the creation of the Universe, all his creative actions which take the form of natural laws or scientific facts must constitute a unified whole. Conversely, since there is a unity in the laws of nature these laws must be the creation of single Creator. It is this Creator Who is known to us as God. The unconscious intuitive conviction of the scientists that the world is a unified whole to which I have made a reference above as the very basis of science is really due to an unconscious half-

understood intuitive conviction, deeply seated in the nature of all human beings that the world is the creation of a single personality.

The Holy Quran has drawn attention of mankind in a very forceful language to the unity of the world as a proof of the fact that it is the handiwork of a single Creator Who is Rahman (The Beneficient).

ما ترى في خلق الرحمن من تفاوت فارجع البصر هل ترى من فطور
ثم ارجع البصر كرتين ينقلب اليك البصر خاسئاً وهو حسير

You will not see any discontinuity in the creation of Rahman, so turn your eyes. Do you notice any discrepancy in creation? Again, turn your eyes for the second time. Your eyes will return to you dejected and tired without discovering any discrepancy in nature. (Does not this unity of the Universe indicate the singleness of its purpose and consequently its creation by a single living Creator?) (67:34)

قل ارايتم ما تدعون من دون الله اروني ماذا
خلقوا من الارض ام لهم شرك في السموات (35:40)

Say, let me know whom do you call besides Allah. Let me know what they have created in the earth or whether they have any share in the creation of heavens.

ام جعلوا لله شركاء خلقوا كخلقه فتشابه الخلق
عليهم قل الله خالق كل شىء وهو الواحد القهار (13:18)

Have they made sharers with God those who have created like Him, but whose creation has got mixed up with the creation of God (so that it cannot be distinguished by them? Is it not a thoughtless ideas? If there had been more than one creator of the Universe then the creation of each should have been different. But the Universe is one and uniform). Say, O Prophet, God alone is the Creator of every thing and He is One and All-Powerful.

هذا خلق الله فارونى ماذا خلق الذين
من دونه بل الظالمون فى ضلال مبين (31:11)

This is the creation of God. Show me what is it that has been created by other creators besides Him. (They cannot show anything). The fact is that (these) people who are (so) unjust (in their judgement about God) are the victims of a clear misguidance.

What the Holy Quran intends to convey in the above verses is that if there had been a sharer with God in His creation, there would have been some evidence of this fact at some spot in this vast Universe where a different set of natural laws would have prevailed. Evidently, the polytheists could not point reasonably to any part of the Universe in reply to this question of the Holy Quran and say that this was the creation of their supposed sharer with God in His creation. The reason is that when natural laws prevailing in one part of the Universe are the same as those prevailing in the rest of it no one can say that the creator of that part of the Universe is not the same as the creator of the remaining Universe. The existence of other creators besides God would have destroyed the unity of the world. The fact that the world is an ordered unity proves that its creator is one.

قل لو كان فيهما الهة الا الله لفسدتا

Say, O Prophet if the heavens and the earth (i.e. the Universe), had had other creators besides God, then it would have (lost its unity and) fallen into a disorder.

21:22

The permanence and immutability of natural laws which make the unity of the world as well as the unity of science possible is mentioned by the Holy Quran again and again as a guarantee of their dependability in case man should seek to adjust his life to them according to the teachings of the Holy Quran.

ولن تجد لسنة الله تبديلا (62:33)

And you will never find any change in the law of God.

فلن تجد لسنة الله تبديلا (43:75)

So you will never find any change in the law of God.

و لن تجد لسنة الله تحويلا (35:43)

And you will never find any alteration of the law of God.

و لا تجد لسنةنا تحويلا (77:17)

And you will not find, O Prophet, any change in our law.

ما يبدل القول لدى (28:50)

With Me the word (i.e. the word *Kun*, Be, once uttered by Me for the creation of a law of nature) is never changed.

In view of this intimate relationship between Reality and Science we cannot separate one from the other. Reality is the organizing principle of scientific facts. So long as it continues to be a function of Science to invent assumptions or hypotheses in order to explain, order or systematize facts discovered by it, the idea of Reality which really explains and orders the facts of science must continue to be a part of it. The integration of an idea of Reality with science is that stage—the fifth and the last stage—in the process of the scientific understanding of the world when having passed the stages of experiment, observation, verification and inference, the scientific facts of the world as a whole begin to be explained, systematized and ordered in the light of a hypothesis of their Ultimate Reality.

(3)

On account of the misrepresentations of European writers the world has remained for long under a misunderstanding that the Europeans were the inventors of the scientific method and the founders of modern science. Thus it was generally understood that the man who invented the scientific method of inquiry was Roger Bacon or his later namesake. Even those European writers who credited the Muslims with some important fundamental achievements in the sphere of scientific studies claimed that the Muslims had learnt the scientific method from the ancient Greeks and had built their science on the foundations of the science of the Greeks, who were, of course, Europeans. But recent researches in the History of Science have revealed what is now an incontrovertible historical truth that the scientific method

which has made possible the emergence and progress of modern science was invented by the Muslims and that it was the Muslims who had laid the foundations of modern science in almost all its important aspects. It will be appropriate to quote in this connection a few passages from Briffault's *The Making of Humanity*. Briffault writes :—

Science is the most momentous contribution of Arab Civilization to the modern world; but its fruits were slow in ripening. Not until long after Moorish Culture had sunk back into darkness did the giant to which it had given birth rise in his might. It was not science only which brought Europe back to life. Other and manifold influences from the civilization of Islam communicated its first glow to European life (p. 202).

For although there is not a single aspect of European growth in which the decisive influence of Islamic Culture is not traceable, nowhere is it so clear and momentous as in the genesis of that power which constitutes the permanent distinctive force of the modern world, and the supreme source of its victory—natural science and the scientific spirit (p. 109).

The debt of our science to that of the Arabs does not consist in startling discoveries of revolutionary theories. Science owes a great deal more to Arab Culture, it owes its existence. The ancient world was, as we saw, prescientific. The Astronomy and Mathematics of the Greeks were a foreign importation never thoroughly acclimatized in Greek Culture. The Greeks systematized, generalized and theorized but the patient ways of investigation, the accumulation of positive knowledge, the minute methods of science, detailed and prolonged observation and experimental inquiry were altogether alien to the Greek temperament. Only in Hellenistic Alexandria was any approach to scientific work conducted in the ancient classical world. What we call science arose in Europe

as a result of a new spirit of inquiry, of new methods of investigation, of the method of experiment, observation, measurement, of the development of Mathematics in a form unknown to the Greeks. That spirit and those methods were introduced into Europe by the Arabs (p. 190).

It was under the influence of the Arabian and Moorish revival of culture, and not in the fifteenth century, that the real Renaissance took place. Spain, not Italy, was the cradle of the rebirth of Europe. After steadily sinking lower and lower into barbarism, it had reached the darkest depths of ignorance and degradation when the cities of the Saracenic world, Baghdad, Cairo, Gordova, Toledo, were growing centres of civilization and intellectual activity. It was there that the new life arose which was to grow into a new phase of human evolution. From the time when the influence of their culture made itself felt, began the stirrings of a new life (p. 188)

But the spirit in which the Arabs made use of existing materials was the exact opposite of that of the Greeks. It supplied precisely what had been the weak and defective aspect of Greek genius. For the Greeks it was in theory and generalization that the interest lay, they were neglectful and careless of fact; the Arabian inquirers' zeal, on the contrary, was careless of theory and directed to the accumulation of concrete facts, and to giving to their knowledge precise and quantitative form. What makes all the difference between fruitful, enduring science and mere loose scientific curiosity, is the quantitative as against the qualitative statement, the anxiety for the utmost attainable accuracy in measurement. In that spirit of objective research and quantitative accuracy the whole of the vast scientific work of the Arabs was conducted (p. 192). It was under their successors at the Oxford School that Roger Bacon learned Arabic and Arabic Science. Neither

Roger Bacon nor his later namesake has any title to be credited with having introduced the experimental method. Roger Bacon was no more than one of the apostles of Muslim science and method to Christian Europe; and he never wearied of declaring that knowledge of Arabic and Arabic science was for his contemporaries the only way to true knowledge. Discussions as to who was the originator of the experimental method...are part of the colossal misrepresentation of the origins of European civilization. The experimental method of Arabs was by Bacon's time widespread and eagerly cultivated throughout Europe"

(p. 202).

After explaining the method of inquiry pursued by the Hindu and Greek astronomers G.R. Kaye writes in his book *"A guide to the old observatories"*:—

"The Arabs and other Muslim astronomers took an entirely different line. They recognized the value of practical observation; they built observatories and devised improvements in the instruments, and set about verifying and correcting Ptolemy's elements".

The line of approach followed by the Muslim astronomers which, as the author says, was "entirely different" from that of the Greeks and the Hindus and which emphasised the value of practical observation was indeed the line of approach of all Muslim Scientists.

It may be asked how is it that the Muslims alone of all the people in the world became interested in the careful observation and study of nature which enabled them to achieve the unique distinction of being the inventors of the scientific method and the founders of science? Even a cursory look at the contents of the Holy Quran will convince any body, that the cause of it is to be found in the teachings of the Holy Quran itself. The Holy Quran not only lays stress on the observation and study of nature as a form of prayer and an essential part of the duties of a believer but also takes its reader in the midst of that

observation and study by drawing his attention to the details of the various phenomena of nature at all levels of creation in about one third of its text. Indeed the earliest and the most powerful exhortation ever made to mankind for the observation and study of nature, is that of the Holy Quran. The Holy Quran lays stress on the observation and study of nature because it is the most fundamental and the most essential of all the activities of man that can enable him to evolve his personality and the Holy Quran has no other object before it except to guide man in the ways and means that lead to the perfect development of his personality. Man is so made that he desires to love fully and wholeheartedly an ideal of the highest beauty and perfection and when he is able to fulfil his desire his personality develops and his peace of mind and happiness increase in the same proportion till they all reach their highest perfection. The essence or the pivot of the teachings of the Holy Quran is that the ideal of the highest beauty and perfection, the love of which can develop the human personality and human happiness fully and perfectly is God who is the Creator of the Universe. But man can love God fully and wholeheartedly only if he has an intimate and personal *feeling* or *realization* or *experience* of the beauty of His qualities which are expressed and manifested in His creation. Hence the only way to feel, realize and experience the beauty of Divine qualities and consequently to love God fully and wholeheartedly is to observe and study the Universe as the creation of God. Prayer is an effort to recall and intensify the feeling the realization or the experience of the beauty of Divine qualities which the believer obtains as a result of his observation and study of nature.

A created object always manifests the mental, moral, spiritual and aesthetic qualities of its creator. It bears the imprint of these qualities. In fact it is wholly what the qualities of its creator have made it to be and it has no existence and no reality apart from these qualities. As a masterpiece of art manifests all the mental, moral, spiritual and aesthetic qualities of the artist who creates it so the Universe manifests the mental,

moral, spiritual and aesthetic qualities of God who is its Creator.

Although God is hidden from the physical eyes of man, yet God's qualities of Beauty and Perfection are visible to man in the Universe around him. It is a characteristic of personality, whether human or divine, that it cannot be observed by our physical eyes. But just as there is only one way of knowing a human personality (that, for instance, of an individual, who becomes one of my best friends on account of my intimate knowledge of it) viz., to observe and study the visible external manifestations of its invisible internal qualities which take the form of its actions, so there is only one way of knowing the personality of God viz., to observe and study the visible external manifestations of His hidden qualities which collectively take the form of this Universe. That is the reason why the Holy Quran invites mankind to observe the phenomena of nature.

“Observe that which is in the Heavens and the Earth”
(10:102)

and expects the believers to think over the creation of the heavens and the earth.

“And those who ponder over the creation of the heavens and the earth”.
(3:191)

That is also the reason why the Holy Quran describes the manifestations of nature as the “signs” of God that is to say the signs of His existence and qualities as the Creator and the Evolver of the world.

“Verily there are in the creation of the heavens and the earth signs for those who possess wisdom (3:190)
There are signs in the earth and in your own beings.
Don't you see”.
(51:20, 21)

According to the teachings of the Holy Quran it is obligatory for a Muslim to apply his senses to observe nature and to use his mental faculties to derive correct inferences from his observation of nature. For unless he does so his beliefs and actions, are likely to be mis-directed. Those who have eyes but do not

use them to see, have ears but do not use them to hear, have hearts but do not use them to understand are worse than cattle and deserve to be thrown into the fire of Hell.

Verily we shall gather for the Hell a large number of jins and human beings who have hearts with which they understand not and who have eyes with which they see not and who have ears with which they hear not. They are like cattle. Nay, they are more astray.

(7:178, 179)

Those who do not make use of their ears and eyes and hearts to hear, see and understand things properly will have to answer for their inability to do so.

Indeed the ear, the eye and the heart all of them are liable to be questioned. (17:36)

The Holy Quran forbids passing the phenomena of nature in the heavens and the earth heedlessly and without thinking over them and understanding their significance. The reason is that they are the signs of God indicative of God's qualities of Beauty, Goodness and Truth, since they bear the impress of these qualities and the man who ignores them loses many a valuable opportunity of knowing and loving God and thereby evolving his personality.

There is many a sign in the heavens and the earth which they pass by, turning away their faces. (12:105)

To give up the study and observation of a natural phenomenon without understanding it thoroughly and uncovering all its secrets is also turning away from it and a believer has been warned not to do so. The need to avoid this attitude is further emphasised in a prayer taught by the Holy Prophet (peace be upon him):—

Our Lord enable us to see Truth as Truth and empower us to follow it and enable us to see falsehood as falsehood and empower us to avoid it. Our Lord enable us to see things as they really are.

This prayer of the prophet indeed implies a stress on the scientific method of inquiry, the object of which is to enable

ourselves to see things as they really are, by endeavouring to be as careful and accurate in our observations and inferences, as possible.

(4)

The particular phenomena of nature to which the Holy Quran actually draws attention of man for being observed and studied by him as the signs of God and of His qualities as the Creator of the World, belong to all the three levels of the Universe—matter, life and mind.

Thus while mentioning the natural phenomena of the world of matter, it calls upon mankind to observe and study the Sun, the Moon and the stars, the heavens, the plain surface of the earth, the mountains, the raining clouds, the blowing winds, the lightening and the thunder, the alternation of night and day, the phases of the Moon, the earlier nebular state of the Universe and the later differentiation of the heavens and the earth etc. Evidently, if we do full justice to the observation and study of these manifestations of nature and thereby come to understand all the physical laws that operate to make them possible it must lead us ultimately to the complete formulation of all the physical sciences. The reason is that scientific facts, as already mentioned, constitute a single system and throw light on each other and lead to each other.

Again the Holy Quran invites man to observe and study among the natural phenomena of the biological world, the dependance of all varieties of life on water, the sprouting of vegetation from the earth, the beginning of the creation of the human form of life in mud, the ripening harvests of food grains, the fruit trees laden with fruits of different shapes, colours and tastes, the gradual development of the human species out of the earth, the spreading on earth of the various species of animals, some of which provide man with milk while others serve him for riding, the flying of the birds on their wings, the resemblance of the animal and the bird communities to human communities, the creation of human beings, animals

and plants as males and females, the wonderful bodily constitution of the camel, God's gift of eyes, ears and mental faculties to man, the development of the human embryo through its various stages in the womb of the mother etc. If we observe and study these phenomena of nature and others related to them in the biological world fully, it must result ultimately in the complete development of all the biological sciences.

Again the Holy Quran appeals to mankind to observe and study among the natural phenomena of the world of the human mind and its activities many important facts of human nature which are manifested in human history, past and current, for example, the emergence of a large number of prophets one after the other all exhorting mankind to love and worship God, the Creator of the World as the true ideal of their life, the acceptance of the prophets' call by some human beings and its rejection by some others who continued to love and worship false Gods, the perfect internal satisfaction and happiness of those who accepted the call of the prophets and their fearlessness of death and disgrace for the sake of their love of God and the miseries and the ultimate ruin and extinction of those who refused to obey the prophets, the fact that the worship of God is conducive to man's highest satisfaction and peace of mind, that the love of God is the most dominant of all the urges of human nature which is permanent and unalterable, that humanity is divided into several conflicting communities because they have forgotten their true nature and have strayed away from the right path which is to love and worship true God and that man has an internal criterion of right and wrong and true and false which is always operating whether a man admits it or not. Alluding to certain functions of the unconscious mind which are only recently understood by the psychologists, the Holy Quran tells us how the actions of the human individual remain preserved in his being and how they are recorded in a folded book which is unfolded before him after death etc. If we observe and study properly these and other related natural phenomena of the world of the human mind which take the

form of human activities, we can develop all the psychological or human sciences completely.

Thus the Quranic injunction that the believers should study the creation of the heavens and the earth, must, if properly carried out, lead to the perfect development of all the physical, biological and psychological sciences. This explains why the Muslims were able to invent the scientific method of inquiry which depends upon the observation and study of nature and to become the founders of modern science. But since the Muslims had taken to the observation and study of nature which had made them scientists under inspiration from the Holy Quran and in obedience to its injunctions, the Holy Quran was the natural pivot of their science.

(5) -

The phenomena of nature are the signs of God according to the Holy Quran in the sense that their complete and accurate understanding is intellectually relevant only to the view that God is their creator. This implies that their true understanding is possible only if they are observed and studied in the light of the idea of God as the Reality of the world. In such a case, the person who occupies himself with their observation and study is able not only to understand them rightly and completely but also to turn his view of Reality into an intellectually established fact on account of its consistency with the results of his observation and study of nature. If the phenomena of nature are not observed and studied in the light of the view that they are the creation of God, their observation and study cannot lead to their complete or accurate understanding. That is why a scientist who is a non-believer or atheist does not become a believer merely as a result of his observation and study of nature. Since he does not love the One True God, his innate love of God, which must find an outlet in some object or idea in any case, enters into a wrong channel, with the result that he begins to love a false god instead of the One True God. Hence he observes and studies nature with a wrong mental outlook and

in a vitiated emotional atmosphere. This makes it impossible for him to derive the right kind of inferences from his observation and study of nature.

Evidently, if the phenomena of nature are really the signs of God as the Creator and Evolver of the world, they can be fully and rightly understood only in the light of the belief that God is the Creator and Evolver of the world. Otherwise, they will be misinterpreted and misunderstood. God, according to the Holy Quran, is the light of the heavens and the earth.

God is the light of the heavens and the earth 25:35

This light illuminates every nook and corner of the Universe. A scientist who endeavours to understand the phenomena of nature in the absence of this light cannot fare better than a man who enters a room at mid-night, switches off at once the light in the room and begins to prepare, in utter darkness, a complete inventory of the articles and furniture that it contains.

A believer sees in nature very clearly the signs of creativeness, protection, nourishment, decoration, beautification, organization, proportion, planning, power, wisdom and knowledge and the qualities of living, seeing and hearing coming into existence automatically. This confirms his belief that the world has been brought into existence and is being maintained by an all-Powerful and all-Knowing Living Creator who is capable of creating, protecting, planning, decorating, nourishing, beautifying, loving, seeing and hearing. It appears to him to be strange that a non-believer should think that there is creativeness in nature but no creator, that there is nourishment but no nourisher that there is protection and decoration and beautification and planning and organization and love but no protector or decorator or beautifier or planner or organizer or lover. But a non-believer cannot help it. He fails to see the manifestations of God's qualities of Beauty, Goodness and Truth in nature because his inborn love for God is being misdirected and misused by a false god, and is not available for being used for the One True God. He misinterprets the facts of nature because, although his eyes can see, his mind cannot understand

properly the meaning of what they see. It is this condition of a non-believer that the Holy Quran describes when it says :—

Verily, it is not the eyes but the hearts in the breasts that become blind. 22:46

Iqbal has expressed the same idea in a beautiful verse :

Dil-i-bina bhi kar khuda se talab

Ankh ka nur dil ka nur naheen

(Implore God to provide you with a heart that can see.
The light of the eyes is not necessarily the light of the heart)

In the above verse of the Holy Quran as also in this verse of Iqbal a heart that can see means a heart which is enlightened by the love of God or at least a heart in which man's innate love for God has not yet been misappropriated by any false God in a manner that shuts it off for True God; a heart which is still sensitive of ugliness and can still feel dissatisfied with the defects of an ideal like the heart of Hazrat-i-Ibrahim (peace be upon him) who could not for long take for his God a star chosen by him for its remarkable brilliance or even the Moon or the Sun. Man is so made that the moment he gives up totally his belief in God as the guiding light of his practical life, even temporarily, for another substitute belief, a belief in a false god, takes its place and begins to dominate his heart. When this happens it means the utter blindness of the heart which makes even the eyes useless.

Human activities which are not-determined by true love are determined by a false love and the research activities of a scientist are no exception to this rule. But a whole-hearted belief in God requires a total rejection of false gods as its most essential condition and this condition is imposed upon man by the inexorable laws of his own nature.

He who denies false gods and believes in True God grasps the most trustworthy hand-hold which never breaks (2:257).

This explains why a scientist who is a non-believer or an atheist cannot become a believer merely as a result of his

observation and study of nature as long as he does not heed the call of the prophets.

The basis of the attitude of the Holy Quran towards science is the fact that the full knowledge of a created object is not possible without the full knowledge of its creator. The created object and its creator throw light on each other and the knowledge of one is indispensable to the knowledge of the other. The reason is that the created object is only an external manifestation of the internal qualities and capacities of its creator and as such its knowledge and the knowledge of its creator are parts of a single whole. The universe is the creation of God. Hence the true knowledge of the Universe which science claims to provide, and the true knowledge of God, are impossible without each other. If a seeker after God desires to know God, he has to observe and study the Universe of His creation as a manifestation of His qualities and if a scientist desires to know the universe, he has to know the qualities and capacities and the aims and objects of its Creator.

Thus the observation of the phenomena of nature can not lead to a belief in God all by itself. On the other hand the full and true knowledge of the observed phenomena of nature itself depends upon a belief in God. A phenomenon of nature is described by the Holy Quran as a sign of God, because its true knowledge is intellectually consistent only with the view that God and nothing else is the Reality of the universe. According to the Holy Quran the true idea of Reality, namely the idea of God, is the beginning and the end of all knowledge of the universe because God is the beginning and the end of the universe and He is not only the outward and visible Reality of the Universe but also its hidden and secret meaning :

He is the first and the last and the manifest and the Hidden. 57:3

The true understanding of every phenomenon of nature requires the true idea of the nature of Reality as its intellectual background. The reason is that if the intellectual background of the person who observes and studies nature is not right, it

must interfere with his effort to derive the correct inferences from his observation and study of nature.

Is the Reality of the world material or spiritual? Whatever may be our answer to this question, the nature and quality of scientific knowledge that we acquire as a result of our observation and study of natural phenomena has to be consistent with and consequently has to be determined by that answer. Our scientific knowledge can never assume a form which is in contradiction with our view of Reality. Science can take its birth only out of a view of Reality and can grow only in the cradle of that view of Reality. As such it is evident that if our view of Reality is correct our science will continue to develop on the right lines without interruption; otherwise its development will be misdirected at some point and it will come to a stop somewhere sooner or later. Soviet science is based on the view that scientific facts are relevant only to a Material Reality of the Universe. The capitalist science is based on the view that scientific facts remain the same no matter whether the nature of Reality is material or spiritual. The Islamic science has to be based on the view that scientific facts can be relevant only to a Spiritual Reality of the world.

In order to understand the exact significance of the verses of the Holy Quran which refer to the phenomena of nature as the signs of God, we have to bear in mind the fact that the approach of Quran to the human heart is psychological and not logical. God Almighty who has revealed Quran has also created man and He knows that man has an irresistible urge to love an ideal of the highest beauty and perfection which can be no other than the personality of his Creator and that man cannot stop or delay the proper satisfaction of this urge. He also knows that man has a tendency to rationalize and justify by logical reasoning even those of his desires which are wrong and unjustifiable. God, therefore, depends, not upon man's capacity for logical reasoning, which he can misuse and misunderstand but upon his pressing and irresistible psychological need to love an ideal of the highest perfection, to guide him to the love of God.

Consequently, the Holy Quran does not endeavour to convince its reader of the existence of God by logical arguments but puts him directly in contact with God by inviting him to feel and experience the beauty of His qualities as they are manifested in the creation of the heavens and the earth and thus enables him to acquire immediately the full satisfaction of an urgent and pressing demand of his nature. He discovers that God's qualities of beauty and perfection to which the Holy Quran draws attention as being manifested in nature, can be only the qualities of the One True God and not of any of the false gods who are being currently adored and worshipped in the world.

(6)

The justification of the Quranic Philosophy of Science, namely, that the universe which is created by God and God Who is the creator of the universe, can be fully and rightly understood only in the light of, and never in isolation from, each other, will be perhaps better comprehended with the help of an illustration.

Supposing a scientist from a world in space lands suddenly on the earth at a place where it is mid-day and the first object that happens to engage his attention is an electric table-lamp placed in the sunshine in a deserted field. The lamp has been made for his own use by a single scientist who has not only produced all the raw material that is required for its preparation but has also made it to pass through all the stages of its construction from one end to the other. The base of the lamp is made up of iron, its stand which is made of walnut wood is beautifully carved, and at the top of it there is an attractively designed shade of painted silk cloth over-shadowing a powerful glazed electric bulb. The scientist presses a button by chance and he is astonished to find that the bulb begins to glow with brilliance. He presses the button again and the light goes off. The scientist is not familiar with electricity and its uses as they are known to us and the conditions of the space world from which he comes are such that darkness is unknown to it and no one there ever feels the need to use a lamp. It has no metals, no trees, no wood, no glass, no rubber nor any other material which

is used by us in the construction of a beautiful table lamp. The scientist observes and studies the lamp carefully in all its parts with a view to understanding what it is, how does it function, how it has come into being and what is its purpose in nature and goes on noting one by one his inferences from his observations in the usual way of the scientists of the earth. He, of course, thinks that the lamp is a natural object like a stone or a rock and does not know that it has been constructed by a scientist for a special purpose. It is obvious even before he starts his investigation that although he will be extremely careful in deriving inferences from his observations yet, since he will have no idea of the maker of the table-lamp, of his qualities and abilities, of his desires and purposes and of his powers and potentialities, his inferences about the causes of the existence and functioning of the table-lamp will be, in spite of his intelligence, most ridiculous even to an ordinary educated man of the earth.

Let us suppose that an invisible angel who knows all about the table-lamp and its maker, takes pity on the ignorance and perplexity of the scientist of the space world and proceeds to deliver him from both. He puts into his hands a written sheet of paper which tells him that the table-lamp has not come into existence by itself, but has been constructed by a scientist for a purpose. Since the table-lamp is visible and its maker is not visible to the scientist, the angel's guiding sheet of paper does not contain any direct information about the table-lamp but contains a complete list of the qualities and capacities of its maker, in view of their indispensable relevance to the knowledge of the table-lamp. It also mentions that if the scientist desires he can see these qualities and capacities of the lamp-maker expressed and manifested clearly in the lamp.

The scientist studies the contents of the sheet of paper and acquires a comprehensive idea of the personality of the lamp-maker and of his qualities and capacities, his desires and purposes and his powers and potentialities. For example, he comes to know that he, sometimes, dislikes darkness, a condition

which exists when light is absent, that he manufactures a table-lamp which can turn darkness into light and that he is fully conversant with Mathematics, Physics, Chemistry, Metallurgy, Agriculture, Horticulture, Weaving, Painting, Carving, Moulding etc.,—sciences and arts which are required by the manufacturer of a table-lamp. He comes to know also that the lamp-maker has a taste for beauty and that when he has a purpose before him he knows what is good and what is bad for him to do for the achievement of that purpose, that is to say, he follows a moral code of Do's and Don'ts. He can grow mulberry trees and prepare silk cloth from cocoons borne by them. He can grow rubber trees and prepare rubber from their milk or manufacture synthetic rubber. He can dig copper ore out of the earth, can melt it and purify it and draw it out into the shape of wires, can cover these wires with rubber and can use them for conducting from one place to another a kind of energy known as electricity. He can dig iron ore out of a mine, can melt it and purify it and mould it into various shapes according to his needs. He can grow walnut trees, can cut them into pieces, can prepare wooden articles out of these pieces and carve beautiful patterns on them. He can prepare glass out of sand and can prepare electric bulbs from melted glass. He can build a complicated machine like a dynamo and can use it to generate current electricity with the help of the energy of flowing water. He is fully aware of the properties of current electricity, can control it and use it in his service in different ways one of which is operating an electric table-lamp and so on.

It is obvious that the knowledge of these qualities and capacities of the lamp-maker will solve completely the riddle of the table-lamp for the spatial scientist and he will begin to feel that it has become extremely easy for him to draw accurate inferences from his observation of the lamp regarding the causes of its existence and the manner of its emergence and functioning. He will find that he is obliged to draw different conclusions, more satisfactory and more meaningful conclusions, from the same observations. He will realize not only that his knowledge of the table-

lamp has become very clear and very exact in the light of his knowledge of the qualities and capacities of its maker, but also that his knowledge of the qualities and capacities of the lamp-maker too has become very clear and very exact in the light of his observation of the lamp. He will realize as a consequence that both the departments of his knowledge—the knowledge of the lamp-maker and the knowledge of the lamp—throw light on each other and supplement each other as inseparable parts of a single whole.

But supposing the spatial scientist throws away the helpful angel's guiding sheet of paper saying :-

“I cannot start with the supposition that the object under my observation is created by somebody for a purpose. I must depend on my own observation and not on any external information for all the knowledge of the object.”

It is obvious that in such a case he will not be able to understand the table-lamp completely even after years of its observation and study and his inferences from his observations (which will be, of course, devoid of the idea of the table-lamp as being entirely a manifestation of the qualities of its maker) will continue to be ridiculous to all men of common sense on the earth, who know the lamp definitely as the creation of a maker. Such is the case with our modern scientist of the Christian West. He insists on understanding the Universe only by his own observations and without taking into consideration, the qualities, the purposes and the powers of its Creator. His inferences from his observations will be most certainly incomplete and faulty, if it is true (as it is certainly true) that the Universe is the creation of God and bears an indelible observable stamp of His qualities, purposes and powers.

It is deplorable that the Muslim scientist of today who should have led the Christian scientist of the West out of his error is following him blindly and sharing his hatred of the idea of God as the indispensable starting point of the scientific knowledge of the Universe. In his overwhelming desire to imitate

him, he has forgotten the great truth communicated to him by the Holy Quran that the phenomena of nature are the signs of God as the Creator of the world and must be observed and studied from this point of view and no other. He has forgotten that every scientific fact, that is to say, every law of nature is what it is on account of the creating, evolving, nourishing, protecting, decorating, beautifying, organizing, and harmonizing activity of God and that a scientist cannot be worth his salt if he does not know how it reflects this activity. He has forgotten that the qualities of God, the creator of the Universe are so kneaded into the constitution of the Universe and woven into its texture that no part of it can be observed or studied or understood in a really scientific manner apart from them. He has forgotten that the qualities of God have the same observable relation with the universe as a thread has with the cloth that is made with it. He has forgotten that as a cloth must cease to exist the moment its thread is withdrawn from it, so the universe must disappear the moment it is deprived of the creating and sustaining operation of the qualities of its Creator. He has forgotten that as an individual cannot understand fully the quality and value of a piece of cloth without taking into account the kind and quality of the thread with which it is woven, so a scientist cannot understand any part of this universe fully without taking into consideration the qualities of its Creator. He has forgotten that as the thread that is woven into a cloth is the beginning and the end and the appearance and the reality of the cloth, so God, the Creator of the world is, by virtue of His qualities, the beginning and the end and the appearance and the reality of the Universe.

He is the First and the Last and the Manifest and the Hidden—Al-Quran.

But, as we have seen, the attitude of the Muslim scientists of old who invented the scientific method and became the founders of modern science and who were also the earliest masters of the Western masters of the present Muslim scientists, was far different from that of the Muslim scientists of today. They did

not consider that the Universe could be understood apart from its Creator. Their belief in God as the Creator and Evolver of the world was the very basis of their observation of nature and investigation and formulation of the scientific knowledge of the world. They, as true Muslims, believed wholeheartedly and without any reservations and qualifications, in the teachings of the Quran. Hence they were convinced that as God is the soul of the Universe He is also the soul of the knowledge of the Universe. They observed and studied nature with a view to acquiring a better understanding of God and His qualities of Beauty and Perfection by acquiring a better understanding of His creative activity in nature. According to them the idea of God was a light without which no true understanding of nature was possible. Their belief in God as scientists was not tentative, under consideration or subject to final confirmation by subsequent scientific research, as that of many scientists of today. On the other hand their scientific research was itself an off-shoot of their belief in God and dependent upon this belief. According to them scientific research could have no purpose and no justification apart from this belief. The knowledge of God as the Creator of the Universe, bestowed upon them by the revelation was far more dependable than the knowledge acquired by them with the help of their senses. Hence they could not think even for a moment that the latter kind of knowledge could, in any way, become a criterion of the former or could have any importance or worth or value of its own except as a further explanation and elaboration of the former. That is why Sarton the western author of an *"Introduction to the History of Science"* has, while mentioning the achievements of the Muslim scientists of various epochs in the field of science, found it necessary to mention also their religious beliefs. This action of his, in his capacity as a historian of science, could be hardly understood in the present age when religion and science are supposed to have nothing in common with each other. Hence in order to satisfy his readers he writes explaining his reason for it :—

“Most Mohammadans believed that the Quran was uncreated. But even those who considered the Quran

as having been created were agreed that it represented the very word of God. I ask once more, how could we reach a correct understanding of Muslim science if we did not fully grasp its gravitation around the Quran? Theology was at once the core of science and the prop of religion. Hence science and religion were inseparable and we cannot hope to understand one without the other.

Our inquiry is restricted to the study of positive knowledge but it cannot be fair unless we base it not upon *our* definition of positiveness but upon *theirs*. Now, as I have indicated, theology, from their point of view was not only positive knowledge, but—if I may coin the phrase—super-positive knowledge. The centre of gravity of their thought was radically different from ours."

It may be asked why the Muslims who were the inventors of the scientific method and the founders of modern science not only lost their position of leadership in the field of science but also became incapable of moving shoulder to shoulder with the Christian scientists of the West and ended by being merely their imitators and blind followers?

The fact is that the intellectual and scientific progress of a community depends upon its capacity to indulge freely in the search for truth and this is possible only as long as it is gifted with political freedom and peace. As soon as the political freedom of a community is lost or threatened, its free search for truth is doomed. In such a case it becomes the slave of another community and its idea of truth itself undergoes a transformation. In such a case the truth that it seeks is not the truth of its own definition of old but of the new definition of its rulers. If it does not actually lose its freedom and its freedom is only threatened even then the conditions of peace disappear and its attention is diverted from the search for truth to the protection of its freedom and its very life as a community. With the destruction of the kingdoms of Baghdad and Cordova were destroyed also

the age-old intellectual traditions of the Muslim community and after that they were never gifted with an epoch of political freedom and peace, long enough to enable them to revive these traditions.

(7)

As long as the Muslims were leading the world in science the idea of God was the pivot of science. Why, it may be asked, did the Christian successors of the Muslim scientists separate the idea of God from Science and even began to look upon it as irrelevant to Science?

The most fundamental cause of the separation of the idea of God from Science was the attitude of modern Christianity towards man's life on this earth. When scientific research passed out of the hands of the Muslim scientists of Spain into the hands of their Christian followers of Europe, the concept of God continued to be the core of Science for sometime. But since the unity of the temporal and spiritual aspects of human life was as incompatible with Christianity in the field of Science as it was in other fields of human activity, a time was bound to come sooner or later when the Christian scientists separated the idea of God and Science from each other.

In Modern Christianity religion and earthly life are not only apart from each other but also opposed to each other. High spiritual merit attended by the blessings of the next world can be achieved, only by a human being who abandons the pursuits and pleasures of his earthly life, as the latter cannot exist side by side with true religious devotion. The saying of Christ "Give unto Caesar what is Caesar's and unto God what is God's", separates in principal the worldly life of a true Christian from his religious life and the actual practical life of Christ mirrored fully this separation. This is so because Christ who was undoubtedly a true prophet had come to the world with a particular mission and that was to emphasise certain aspects of the religion of Moses, to deliver the Israelites from hypocrisy which had become their second nature and to enable them to practice the virtues of whole-hearted

love and devotion. It was not his role to integrate religion with the political, economic, educational, social, legal and military aspects of the worldly life of man either by his precept or by his example. This important task was to be accomplished at its own time by Mohammed (peace be upon him) the Last and the Most Perfect of the prophets. Rev. Martin D'Arcy is right when he says in his book *Communism and Christianity* :—

“But it cannot be too often repeated that Christianity was not founded to lead any nation or super-nation to prosperity. This was the mistake of the Jews and when people sought to make Christ King, he fled away from them into the mountain.”

Religion, according to Modern Christianity is, therefore, poles apart from Science. The former is meant not for the betterment of this life but of the next. The latter is useful only in this life. Religion consists of a set of irrational beliefs or dogmas and relates to an unseen world, beyond the reach of our senses. The conclusions of Science are on the other hand based on reason, observation and experiment. Consequently, if we bring God into our intellectual discussions they must fall short of the standards of rationality and enter the domain of religion which favours dogma and prejudice and emphasises the slavery of reason and intellect. How different is this attitude from the view point of the Holy Quran which calls upon man to observe and study the phenomena of nature as signs of God in order to know God and exhorts him to use his faculties of seeing, hearing and understanding to escape being thrown into the fire of Hell?

In Islam belief depends upon the observation and study of nature. In Christianity belief is out of keeping with and, indeed, in conflict with the observation and study of nature. That is what compelled the Christian Church to penalize intellectual freedom and to persecute the scientists and make them face the dreadful tyrannies of the inquisitions. The Christian scientists of Europe were thus obliged to start with the dogma that God and Science are irrelevant to each other and all the natural phenomena of the worlds of matter, life, and mind must be understood and

explained without reference to God. In the meantime the quarrel of the state and the church became so bitter and long-drawn that ultimately the two had to be separated from each other. This was again in accordance with the requirements of Christianity. But when religion is once separated from the state, it becomes impossible for it to retain its hold on any important aspect of the practical life of the individual and the community. Consequently, religion was thrown not only out of the political life of the individual and the community, but also out of the legal, social, economic and military and the educational and intellectual departments of their life. The result was that the idea of God disappeared not only from the science text-books but also from all the other text-books of the schools, and colleges of European countries.

When the intellectual and scientific atmosphere of Europe had become completely Godless in this way the Christian scientists who breathed in this atmosphere could not but reach scientific conclusions which were in keeping with it. Since they started with the dogma that the Universe can be fully explained without reference to God, they were led unconsciously to interpret the facts of nature according to this dogma and to arrive at conclusions which were unconsciously intended to support this dogma, and thus made science itself to speak in its favour. The unfortunate result of this was that the separation of God and science which was originally forced upon the Christian West as a need of the Christian religion came to be regarded, in due course of time, as a need of science itself.

One example of such conclusions of the scientists of Europe intended unconsciously to support the dogma of intellectual Godlessness was the view of the physicists of the nineteenth century that matter is indestructible and real, that the world is like a machine which functions automatically under the laws of physics and that the idea of a Creator is, therefore, irrelevant to its explanation.

The present century has, however, brought to light a number of physical facts which compel physicists to believe that this

view is unfounded and that it is consciousness rather than matter which must be regarded as the ultimate Reality of the Universe.

Another example of such conclusions is the evolutionary theory of Darwin who explained organic evolution and the emergence of man as an outcome of the blind and fortuitous play of the reckless forces of nature which he described as the struggle for existence, natural selection and the survival of the fittest. According to him it was a mere chance that man had developed such faculties as reason, conscience and imagination and could indulge in such activities as religion, morals, politics, education, science, art, law and philosophy. What is now a human being might have been easily a worm crawling in a gutter.

Although the theory of Darwin related principally to organic evolution, its implications were such that they encompassed the whole range of knowledge. Darwin had said that his theory was potentially a complete philosophy of existence and he was right. It is this fact really that made it the greatest support of the intellectual Godlessness of Europe. Here was a theory of man and Universe which could explain every thing without the aid of any ultimate spiritual forces and factors that may be operating in nature. How well did it suit the nineteenth century materialism and disgust for religion? No wonder, therefore, that it was generally accepted by the intellectual world of Europe in Darwin's own time and since then has had a profound effect on the development of all branches of knowledge. It is due to the undying influence of this theory that even today it is generally believed that every phenomenon of nature whether it relates to the world of matter or life or mind is a chance product of the mechanical process of evolution and is capable of being explained by reference to its immediate past which really creates it and without reference to God, spirit, purpose or consciousness.

However, many biologists are of the opinion that Darwinism or the view of natural selection as an adequate cause of organic evolution is now dead. Biologists like Bergson and Driesch have

given alternate theories of the causes of evolution which are regarded by many other biologists as more convincing and more in accordance with facts.

Although nineteenth century Materialism, Mechanism and Darwinism are now seriously questioned and even discredited by competent scientific opinion the dogma of intellectual Godlessness which had given rise to them and which they, in their turn, had affirmed and upheld, still persists. The reason is that a science may verify or affirm but can never believe or disprove the preconceived idea or dogma on which it is based, however unreasonable or unauthorized this dogma may be as a matter of fact.

Darwin was a staunch Christian. How was it then that the evolutionary process which is really an enlightening manifestation and convincing evidence of the creative activity of God in nature appeared to him to be merely a mechanical or automatic process consisting of a series of chances played out by the blind forces of nature and devoid of all traces of the intelligence, love and care of a Creator. The reason is that Darwin was a victim of the intellectual prejudice against the idea of God which was prevalent in Europe in Darwin's own time and his unconsciously biased research work as a scientist could not but strengthen this prejudice further. There can be hardly a greater misunderstanding labelled as science than to say that the emergence on the earth of a race of such wonderful creatures as human beings by a gradual process of evolution, is a mere chance and not the result of the purposeful activity of a wise, nourishing, protecting and evolving Creator. It can be only described as a self-imposed intellectual blindness to which the Holy Quran has made a reference in the following words :-

It is not the eyes but the hearts within-in the
breasts that become blind.

(8)

What is alien to us is not science but the Godless attitude towards nature which was innovated by the Christian West and made by them the basis of science and this attitude is alien not only to

us but also to science. My plea is that science is a spiritual activity and must have a spiritual basis. In so far as science is made to rest on Godless foundations, it is kept under artificial and unnatural restrictions which must ultimately weigh upon its all-round continued progress. Godlessness cannot be a natural basis of science as a study of natural phenomena. Since the phenomena of nature are created by God, the qualities of God determine their character and the essence of their character is order. The business of the scientist is no more than to discover and record the order present in natural phenomena. Had there been no order in the phenomena of nature science would not have been possible. Yet order can never be accidental. It is a certain indication of the activity of a mind. Thus every time that the scientist acquires a new knowledge of the order in natural phenomena he is faced with the question: Whose mind is there at work in nature? He cannot avoid this question but has to answer it in order to bring his inquiry to a satisfactory end. It is evident that it is the scientist alone who can answer the questions raised by his own inquiries and not others who are not conversant with his methods or results. The Muslim scientist at least can have no difficulty in answering this question by saying, "It is the mind of God the creator of the world," on account of his knowledge of the Quran and he must answer it, not only to bring his investigation of truth as a scientist to a meaningful conclusion, but also to save his pupils from being misguided and confused by the variety of inadequate answers to it given by the western scientists in the form of imaginary substitutes of God such as a Mathematical Mind (Jeans), a Mind-Stuff (Eddington), a Life-Force (Bergson) an Entelechy (Driesch) etc. This is how Science can be re-established on its own spiritual foundations.

It is a general law of Physics that all fluids contract when cooled but water expands when cooled below 4°C with the result that ice is lighter than water and floats on its surface. But for this apparently insignificant fact which is a departure from a general rule, organic life on earth would have been impossible as all the oceans and lakes on this planet

would have frozen from top to bottom. The revised text book of Physics will not alter the fact of the contraction of fluids by cooling—which is indeed unthinkable—but will explain that the exception from a general law in case of water is not a blind chance but has been ordained by God Almighty in His mercy with a special purpose and that purpose is to evolve and maintain the human race on earth. It is a manifestation of God's qualities as the Creator, Evolver and Protector of man on this planet. A physicist who studies the physical world in the light of his conviction that God is the creator of the world and His qualities are manifested in His creation can easily multiply such instances. He cannot fail to discover sooner or later that all the laws of matter have been designed by God for the purpose of making possible the emergence and evolution of life on this earth, for the exceptions wherever they were necessary have not been ignored. Indeed, such instances can be endlessly multiplied not only in the physical sciences but also in the biological and the psychological sciences.

The wonderful achievements of science in making human life beautiful, comfortable and efficient are now well known in every nook and corner of the civilized world of to-day. Only the most ignorant can deny the importance of scientific knowledge to the life of a nation in this age. But we need to excel in science particularly because we must now make amends for our indifference to it in the past on account of which we have lagged far behind the advanced nations of the world. We need to come back to science with all the enthusiasm and intellectual vigour that characterized our forefathers, the first scientists of the world, and to recapture our position of leadership in this field which we have lost to others. The ancient Muslim scientists found science growing spontaneously out of their idea of God as the creator of natural phenomena. To them science was an elaboration of this idea. Consequently, they were as enthusiastic about science as about their religion, and thus managed to excel in it. If we succeed in integrating the concept of God with science, Islam and science will cease to be impedi-

ments to each other and will rather support each other. We shall then, like our forefathers, feel the same enthusiasm for science as we feel for our religion. and shall, like them, excel in science. The integration of religion with science is not without a precedent even in modern times. A modern example of it is to be found in Russia where Science is based on Dialectical Materialism which is the religion of the Russians.

The idea of the integration of the concept of God with Science has been emphasized by Iqbal with all the force of his poetical eloquence and the keenness of his philosophical acumen. He laments the separation of Science and the concept of God as a grievous loss to humanity. A science which is devoid of the love of God as its basis is, to him, like an empty scabbard in the hands of a fighter :—

Ishq ki teg-i-jigar dar urali kisne

Ilm ke hath men khali hai niyam ai saqi

(Who has stolen away the mighty sword of Divine Love?
Science is holding an empty scabbard in its hands.)

Again he is of the opinion that if the observations of a scientist are not accompanied by the spiritual visions of a Moses, the resulting science will be defective and short-sighted.

Woh Ilm Kam basari jis men hamkinar naheen

Tajallyiat-i-Kalim-o-mushahidat-i-hakim

(That science is a mere shortsightedness in which the observations of the scientist are not accompanied by the vision of a Moses.)

In a poem entitled *A conversation between Science and Divine Love* Iqbal makes science to speak to Divine Love as follows :—

1. *My eyes have observed the secrets of the entire Universe. Even time has fallen into my snare.*
2. *I have been allowed to open my eyes to see this physical side of existence. I have nothing to do with the metaphysical world beyond the Heavens.*
3. *A hundred notes pour out of my musical organ. I throw my secrets out into the streets for all to know.*

To this the Divine Love replies :—

1. *Your magic has caused the ocean to become an abode of flames and the atmosphere to pour out fire and to become poisonous (The poet refers to war-ships, bombs and poison gas).*
2. *When you were friendly towards me you were a light. Now that you have broken away from me your light has turned into fire.*
3. *You were born in the private apartments of spirituality but you have fallen a prey to the Devil.*
4. *Come turn this earth into a Paradise. Make this old and decaying world young again.*
5. *Come take a grain from the sentiment of my heart and create with it an Eternal Paradise on earth.*
6. *For, we are friends from the very day of eternity and happen to be the treble and bass of the same melody.*

The concept of God and science are only two aspects of Truth which is one and indivisible. To say that the two cannot be associated with each other is incorrect. Rather the fact is that the two cannot be kept apart from each other deliberately and wilfully without making both of them wrong in some of their aspects. The fact that the concept of God is revelation and Science is observation does not make them different from, or irrelevant to each other as long as both come from the same source and happen to be aspects of the same indivisible Truth. The concept of God is an important instalment of Truth (the most fundamental and of the highest practical importance) sent to us in advance by a special arrangement of nature known as prophethood in view of the urgency of its need. It provides scientific observation with the background knowledge that it requires for its own guidance in order to save itself from grave errors and to shorten and facilitate its journey towards its destination of understanding the world which it may otherwise never reach. It can not come into conflict with the results of scientific observation on account of its very nature as truth but on the other hand must help it to succeed quickly and easily as

in the case of the spatial scientist I have mentioned above. If we divorce a truth from another truth intentionally, no matter what the origin of the one or the other truth may be, we reduce both of them to half-truths, again, because Truth is one and indivisible.

That is what Iqbal means when he says above that science was born in the apartments of spirituality and that the concept of God and science are old friends who have got separated from each other to the detriment of both. The integration of the concept of God with science is not merely an economic and moral need of our community although it must serve our economic and moral needs as well. It is an intellectual or scientific necessity of the highest urgency which has to be met as much for the sake of science as for the sake of our economic, moral and ideological existence.

Iqbal predicts in the verses quoted above that should the two separated friends—the concept of God and science—be restored to the company of each other, it must make this old and decaying world young again and must turn this earth into an eternal Paradise. He has repeated this prediction several times in his poetry. But he is not content with making predictions. He exhorts the Muslims to arise and create a world revolution by integrating the concept of God with science, which, in his poetical language, he describes sometimes as *Ilm* (knowledge) and at other times as *Ziraki* (Wisdom).

Ishq chun ba ziraki hambar buwad
Naqsh band i alam i digar shawad
Khez o naqsh i alam i digar binih
Ishq ra ba ziraki amez dih

(When the love of God becomes the associate of science a new world-order is born. Arise and create a new world-order ! Associate the concept of God with science.)

Humanity needs badly today an ideology which is at once spiritual and scientific, which is a religion as well as a science of man and the Universe. Such an ideology will be perfectly satisfactory to mankind for it will be consistent with all the

true facts of science and will be capable of meeting all the emotional and intellectual requirements of human nature. It will be a scientific explanation of the world and on account of its rational justification will be eagerly accepted by humanity.

The reason is that man is so made that he has an insatiable thirst for knowledge and an irresistible desire for truth and when he finds truth and is able to recognize it, feel it, realize it and experience it as such, he cannot help making it his own. Our present ideological differences are due to the fact that so far humanity is not aware of an ideology the truth of which may be easily and readily felt and realized by all. When such an ideology is known it will be willingly accepted by the world and then all ideological prejudices, differences and animosities will disappear automatically and without any body having to strike a blow.

We sometimes express the desire that we should produce a scientific interpretation of Islam which may be acceptable to all. But a scientific interpretation of Islam means that interpretation of it which is relevant to all the true facts of science. It will be that rationally satisfactory explanation of man and the Universe mentioned above which will be both scientific and spiritual and which will be capable of spreading automatically to the ends of the earth bringing to humanity the gifts of a permanent peace, a stable unity and an ever-growing prosperity. But such a scientific interpretation of Islam can emerge only if the concept of God is integrated with Science. This is what Iqbal means when he says that if the concept of God and science are restored to the company of each other this old and decayed world will become young again and the earth will turn into an Eternal Paradise.

(9)

The separation of God and science innovated by the Christian West under the stress of their religious traditions is one of the greatest tragedies of human history. Although it appears to have been a silent, simple and peaceful event, yet innumerable past and present misfortunes of mankind are such that if we make

an effort to discover their original or ultimate causes, this tragedy turns out to be at the root of all of them. It has prevented and is still preventing mankind from knowing their Creator and discovering and actualizing the potential bonds of love which unite them into a single family of God although this is their destiny. It has divided them into a large number of mutually hostile communities known as nations, every one of which has set up its own territorial or racial idol to worship and every one of which aspires to dominate the world at the expense of all others. It has made the life of nations a one long painful story of open or concealed, violent or non-violent conflicts with each other. It is the ultimate cause of the present series of world-wars broken only by intervals of hectic preparations, which now threatens to destroy the entire human race in an atomic war of the future. It is the real cause of the ever-increasing world wide delinquency and lawlessness of our young boys and girls. It is responsible for the lot of most of those unfortunate persons who commit suicides or get admitted into mental hospitals in ever-increasing numbers every year. It is the cause of the growing hatred of individuals and nations for all moral standards and values throughout the world. It has deprived knowledge of its sanctity and reduced it to an instrument of material and economic benefits. It has undermined the discipline of educational institutions and destroyed the respect of students for their teachers and professors. It has divided scientific knowledge into water-tight compartments and made impossible its integration into the single whole that it is. It is retarding the progress of the biological sciences and has since long brought the progress of the human and social sciences to a dead stop.

Above all it has caused the continuous dwindling of the faith of Muslims in Islam all over the world and made it increasingly difficult for them to adjust their practical life as individuals and communities to the needs, and aspirations of Islam. Fortunately, the intellectual ideas which had favoured the prejudice of the European scientists against the concept

of God in the nineteenth century have now suffered a setback. For example, the top physicists of the world like Sir James Jeans, Eddington, Schrodinger, Einstien, Planck etc., are now of the opinion that the facts of Physics discovered in the twentieth century point to consciousness rather than matter as the reality of the world. Sir Joad writes :—

“Both Sir James Jeans and Professor Eddington have speculated at some length on the implications suggested by the present state of our knowledge of the physical world. Both regard these implications as definitely idealistic; their considered view is that Physics suggests that the reality of things is mental or spiritual and that so-called material phenomena are the effects of the way in which this spiritual reality appears to us. Or, as Eddington would say, material phenomena are the result of abstraction and selection by our minds from the spiritual unity which underlies them. Although the philosophical views of continental physicists are not so well known in this country, it appears that they too subscribe in the main to the general view of mind as fundamental and matter as derivative from mind. This, at least is true of Einstien, Schrodinger and Planck”.

Sir James Jeans describes the ultimate reality of matter as a Mathematical Mind and Eddington describes it as a universal Mind-Stuff. Similarly, some well-known biologists like Bergson and Driesch have challenged the evolutionary theory of Darwin and have advocated instead, with the help of an impressive array of facts, a different theory of evolution according to which the cause of evolution is the operation within the organism of an invisible conscious force which has a purpose, which is aware of its purpose and which can act for the realization of that purpose. But in spite of this new turn of scientific thought in favour of the reality of consciousness or spirit the prejudice of the European scientists and their followers against the concept

of God, the seeds of which were sown in the past centuries still persists. The reason is that the roots of this prejudice are laid deeply in the nature of Christianity and in the unshakable religio-cultural constitution of the European intellectual. Moreover, a science which is not based on the concept of God can never prove or own the concept of God as a part of it. Thus we see that even those physicists who admit that the Reality of the world is consciousness are not prepared to say that it is God. Similarly, the biologists who agree that the cause of evolution is a conscious force which has a purpose in the world are afraid of saying that it is God. This is so in spite of the fact that the assumption which can really explain and order the facts of modern Physics and Biology to which I have made a reference above, is the complete personality of a Creator and not merely a supposed mind or a consciousness possessing only the quality of purposive activity or only the quality of mathematical thinking. For, if we grant one quality of consciousness to an entity we cannot reasonably resist the conclusion that it must have all the qualities with which consciousness is associated in our knowledge and experience. Sir James Jeans concludes that the reality of matter is a mind like our own in the quality of mathematical thinking, but there is no reason why it should not be a mind like our own in emotional, ethical and aesthetic qualities as well. In our own experience we have never known mathematical thinking or purposive activity to exist in a mind independently of moral, aesthetic or emotional qualities. The highest form of intelligence implies the highest form of consciousness which is self-consciousness and which means a personality or self having all its characteristic qualities, emotional, moral, intellectual and aesthetic. But the western scientists cannot come to this justified conclusion on account of the presuppositions of their science.

We, Muslims could have never shared the misfortune of being the victims of an intellectual prejudice against God which has fallen to the lot of the European scientists owing to their peculiar Christian attitude towards man, God and nature. The reason is that Islam has a very different world outlook. But we

have shared this misfortune with the European scientists by overlooking the teachings of Islam, by discarding the traditions of the ancient Muslim scientists, the founders of science, and by following blindly in the footsteps of the Western scientists.

In Islam there is no contradiction between the concept of God and science. On the other hand, the idea of God, according to Islam, is the key to the mysteries of the Universe which the scientist aspires to discover by means of his experiments and observations. Since God is the soul of the Universe, He is also the soul of the knowledge of the Universe which we call science. The scientific laws manifest the qualities of their Creator. How can we understand these laws fully without relating them to the qualities of their Creator, which they manifest and which have made them what they are ?

The laws of nature whether they are physical, biological or psychological constitute a single whole or a single family. They throw light on each other and support each other intellectually and rationally. The most important laws of nature are the laws of human nature and the most important one of the laws of human nature is that law which happens to be the basis of the teachings of Islam, namely, that man has an urge for Beauty, Goodness and Perfection which can find its fullest satisfaction only in the love and worship of God. Islam enjoins upon man the love and worship of God because it is demanded by the most fundamental and the most important law of his nature. That is why the Holy Quran describes Islam as the Law of God. This law of human nature governs the human world and is one of the vast family of the general laws of nature some of which govern the world of matter as physical laws while others govern the world of life as biological laws. It cannot be irrelevant to the other laws of nature whether psychological, biological or physical. It must, on the other hand throw light on them and support them intellectually. If it is divorced from the other laws of nature studied by the scientists, these other laws must suffer in their validity and clarity. Moreover, the laws of nature are relentless and inexorable. None of them whether they are psychological,

biological or physical, can be altered or disobeyed with impunity. As man cannot violate any of the physical or biological laws without being harmed and without submitting to it ultimately, so man cannot violate the greatest law of his nature, according to which he must love and worship True God, without being harmed and without submitting to it in the long run. Man is so made that if he cannot love and worship True God immediately he has to love and worship a false God instead and to return to the love and worship of True God after suffering the evil consequences of his wrong love. In other words, man cannot seek a religion other than Islam because Islam is in his nature. As every thing in this world has to obey the laws of its nature and cannot go against them, so man has to obey the most fundamental law of his nature and cannot go against it safely. The Holy Quran refers to this fact as follows :—

“Do they seek a religion other than the Law of God, while the fact is that all in the Heavens and the Earth submit to Him in obedience; willingly or unwillingly and to Him they will return.”

Thus the Islamic concept of God is not alien to science as a study of the laws of nature. It is itself one of the laws of nature. It is one of the facts of science. The fact that it cannot be proved by the ordinary methods of Physics does not exclude it from the category of truths or established facts. Every science has its own methods for establishing its truths which are necessitated by the particular nature of the department of existence with which it deals. The methods of Physics cannot be applied totally either to Biology or to Psychology. But that should not mean that Biology and Psychology are not sciences and that Physics is the only department of knowledge that has a right to be called a science. According to any reasonable and universal definition of science all real facts of the Universe must be the facts of science whether they relate to the world of matter or the world of life or the world of mind. But who can deny that even in Physics a hypothesis which explains

and orders satisfactorily a number of known and established facts ceases to be a mere hypothesis and acquires the status of a known and established scientific fact itself. This is the method adopted by the Holy Quran to prove the fact of God as the Creator of the World and the Beloved of man. That is why it draws the attention of man to the physical, biological and psychological facts of this Universe known to him at the time it was revealed and describes them as signs of God. Those of us who believe in God as a fact have no doubt satisfied their intellects that it is true, although they had come to know of this fact first of all through the revelation. We believe the concept of God to be a fact on the basis of revelation because we are convinced that it alone explains and orders satisfactorily all the known facts of this universe, physical, biological and psychological, to which the Holy Quran has itself drawn our attention.

To say that God is not a scientific fact because we cannot see God is not reasonable. The visibility of an object or an entity is not essential to a scientific proof of its existence. If we become scientifically sure of the presence of smoke at any place we become scientifically sure also of the presence of fire at that place although fire itself is not visible to us. Indeed, not only the existence but also the details of the qualities and characteristics of an invisible object or entity can be known scientifically by its visible effects and manifestations. The atom has been only recently photographed by an American scientist. No scientist had seen it at the time it was used to destroy Hiroshima. Yet it was a scientific fact at that time, because although its knowledge was not the result of direct observation, it was a hypothesis which explained and ordered a number of facts based on direct observation. God is a scientific fact for the same reason and that is why we believe in God as we believe in any scientific reality of which we are sure. Hazrat-i-Ali used to say that should the curtain between him and God be removed and he be allowed to see God face to face with his physical eyes, this will not increase by one jot his belief in God. This is quite intellegible. A physicist of the days of

the destruction of Heroshima could say, similarly, that if he were to see an atom with his naked eye, it will not increase by one jot his knowledge of the atom as a scientific fact. Observing the effects of an invisible entity is as good as observing the entity itself.

If Islam is to be integrated with Science the integration can be only natural and never forced or artificial. I think the concept of God as the only possible explanation of the existence of order and purpose in nature is the only point where Islam and science come into a natural contact with each other and we can stand in the way of this contact only at the cost of the clarity of both.

(10)

It is not possible to have a science which is not based on any preconceived idea. The fact is, as I have already submitted above, that science can be built only on the basis of a number of preconceived ideas which are of the nature of beliefs or dogmas accepted without proof. One of these preconceived ideas is that there is order, continuity and uniformity in nature. Other preconceived ideas of the scientist relate to his views about the nature of science, about the nature of Reality, about the relation between science and Reality, about the nature of the scientific spirit and about the mental and moral attitudes of the scientist favourable to impartial scientific research and growth of science. It is these preconceived ideas of the scientist which constitute his Philosophy of Science.

When a scientist says that science cannot have or should not have any preconceived ideas or any philosophy as its basis it only means that he is stating his own preconceived ideas or his own philosophy of science and that he is not very clear about these ideas and this philosophy. It means also that he believes in that vague Godless philosophy of Science which is in favour with the Christian West.

The Russian philosophy of science can be summed up as follows :—

The Reality of the world is material and its nature is such that scientific facts are related to it

intimately. Hence if we keep in view the intimate relation of scientific facts to this material reality in the course of our scientific research our scientific conclusions will be valid. On the other hand if we do not keep this relation in view and do not base our scientific inquiry on it our scientific conclusions will be incorrect.

This view is not based on any observation or experiment and is not a scientific fact in any known sense of the term. It is a presupposition, a preconceived idea, a belief or a faith which is a part of the religion of Dialectical Materialism. Against this Russian philosophy of science, the philosophy of science in vogue in the Christian West can be stated as follows :—

“Whether Reality is material or spiritual its nature is such that scientific facts of the world have no relation with it except in so far as they may themselves prove this relation at some time in future. Hence if we accept the present absence of relation between scientific facts and reality and base our scientific inquiry on it our scientific conclusions will be valid. If, on the other hand we do not accept this fact and do not base our scientific research on it our scientific conclusions will be incorrect.”

This view also is not based on any experiment or observation and is not a scientific fact in any familiar sense of the word. It is a preconceived idea, a presupposition, a belief or a faith which is a part of a religion which the scholars have distinguished from other religions by giving it a separate name—that of scientism. The internal contradiction of scientism which discredits it as a rational philosophy lies in the fact that its follower imagines that he will not accept any view of Reality as long as science has not proved that view and that Science may or may not prove any view of Reality in future. This is self-deception. The fact is that when the follower of scientism says that science is independent of Reality and a self-sufficient explanation of the world he has already accepted a view of Reality

and come to believe in a philosophy of life or a religion which is scientism itself. As long as he is a follower of scientism he cannot get rid of his view of science as being the Reality itself although he may claim to have discarded all views of Reality as unscientific.

Belief in a view of Reality is a human need which is so imperative and compelling that no scientist can delay its satisfaction even for a single moment. As a human being a scientist accepts a view of Reality before he has the chance to prove it. His scientific research does not guide him to any view of Reality which is always based on his intuition or direct vision of an idea of Beauty, Goodness and Truth. On the other hand his view of Reality which he has already adopted guides him in his scientific research. The idea that science can be a complete explanation of the Universe or a substitute for religion is not true. Such an idea will be rejected by eminent scientists like Sir James Jeans, Eddington, Einstien, Planck and Schrodinger whom the facts have compelled to admit that science is not the whole of Reality but itself needs a view of Reality as its subjective element. J. W. N. Sullivan wrote in his article entitled "*Interviews with eminent scientists*" published in *Observer* of the 13th of April 1930:—

I found that not only Einstien but also Planck and Schrodinger fully recognized the subjective element in Science."

Sir James-Jeans writes :—

"We live in a world of shadows; science is no more able than is daily experience to introduce us to the originals. It only studies the shadows with greater exactitude. Of the reality behind the shadows science can give us no knowledge."

Lord Joad writes in his book *Guide to modern thought* while summarizing the arguments of Sir James Jean and Professor Arthur Eddington :—

"We are now in a position to put together the preceding lines of argument and to draw our conclu-

sions... The world that science studies is not the real world but a selected and abstracted aspect of something that underlies it. But just as we can describe neither beauty nor humour, so it is unfair to expect those who do in fact have knowledge of this *reality that underlies the world of science* to give a logical account of it... If we ask how the reality is to be conceived it is probable that we shall get a number of different answers varying with the personality of the answerer. It is a mathematicians mind according to Sir James Jeans, a universal mindstuff according to Professor Eddington an organic unity rather like a person according to Professor Whitehead a stream or force of life according to Bergson. To this reality the approach is not through science but through art, through the appreciation of nature and above all through religion."

Islam has not left the scientist without guidance in his effort to discover the reality which underlies the world of science and which has been conceived differently by different scientists. According to the teachings of the Holy Quran that Reality is God with all His Qualities of Creativeness, Power, Beauty, Goodness and Truth and we have seen that the Holy Quran lays all emphasises on this fact. There is no reason why a Muslim professor of science should not be ready to accept this guidance of the Holy Quran openly in the text-books of science prepared by him for his students. Instead of leaving them to the vague opinions of the scientists about the manner in which the basic reality of scientific facts must be conceived he should tell them clearly that that reality is God. This is how Islam and science can be integrated naturally with each other. The Quranic view of the relation between scientific facts and reality or the Quranic philosophy of science can be stated briefly as follows:—

"The Reality of the world is God and scientific facts are related to the concept of God intimately. Hence if we keep in view the intimate relation of

scientific facts to the concept of God in the course of our scientific research our scientific conclusions will be valid. On the other hand if we do not keep this relation in view and do not make it the basis of our scientific research our scientific research will be automatically based on a wrong view of Reality with the result that our scientific conclusions will not be completely accurate somewhere.

It is this philosophy of science broadly understood in the light of which the Muslim scientists of old invented the scientific method and laid the foundations of modern science. What is there to prevent us from making it our own once again in order to live and progress and save the world ?