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Science and Spirituality in our Era

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ABSTRACT

Science seeks to discover the order present in nature and describes this order in the form of laws. Religion is a response to a Transcendent Being Who transforms our lives and gives it a meaning. Traditionally, spirituality was regarded as an integral aspect of religious experience, and spirituality and religion were inseparable. But, the decline of organized religions and the growth of secularism in the western world have given rise to a broader view of spirituality which includes reference to those aspects of human experience which go beyond a purely materialist view of the world, without necessarily bringing in a supernatural reality. Scientific revolution started in the seventeenth century with the works of F. Bacon, Descartes, Galileo, Newton, Boyle, etc. and gave rise to the promotion of empiricism by Bacon and Galileo and the propagation of mechanical worldview by Descartes, Galileo and Newton. Gradually the power of Newtonian system impressed the scientists, and the role of God was first reduced to the initiator of the universe and with the French enlightenment it was eliminated. With the appearance of Philosophers and scientists like Hume ,Kant ,August Comte, Marx, Darwin , Durkhim , Freud and logical positivists, empiricism became the dominant philosophy and with that metaphysics ,religion and spirituality went into the sideline.Several important currents started during the second half of the twentieth century which had a revival effect on religion and spirituality and some eminent scientists of our era –including some non-theists – have emphasized the necessity of going beyond the material features of life and paying attention to its spiritual aspects (values, meanings, etc.).

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Intruduction

Science seeks to discover the order present in nature and describes this order in the form of laws. Religion, on the other hand seeks to find the meaning and telos in the world and our position in it. It is a response to a Transcendent Being Who transforms our lives and gives it a meaning. At the present time, spirituality has a wide spectrum of meanings. It can refer to an interior journey for discovering one's essence and also the values and meanings by which one lives, to the practice of prayer and meditation and righteous living, and to a general commitment to authority.

Traditionally, spirituality was regarded as an integral aspect of religious experience, and spirituality and religion were inseparable. But, the decline of organized religions and the growth of secularism in the western world have given rise to a broader view of spirituality. Thus, for some of the eminent scientists of our time, spirituality refers to those aspects of human experience which go beyond a purely materialist view of the world, without necessarily bringing in a supernatural reality. Islamic spirituality calls individuals for being conscious about they're their origin, reality, and ultimate destination.

In the Qura'nic view man has both material and spiritual dimensions. But what makes man's personality and brings him eternal happiness is his spiritual dimension. Thus, man has to put his material dimensions in the service of his spiritual dimensions. This can be achieved by developing all of his constructive potentialities and suppressing all the destructive ones.

In view of the foregoing considerations, the history of the relation between science and spirituality coincides mostly with that of science and religion and it was mostly during the twentieth century that spirituality was used in a more general sense than in the religious context.

Scientific revolution started in the seventeenth century with the works of F. Bacon, Descartes, Galileo, Newton, Boyle, etc. Newtonian Mechanics was one of its immediate results. Scientific revolution had two important ingredients: the promotion of empiricism by Bacon and Galileo and the propagation of mechanical worldview by Descartes, Galileo and Newton. In the mechanical worldview the world was taken as a machine which is ruled by natural laws. Newton and his disciples believed in a God who is creator and active. But in the following generations, the apparent self-sufficiency of Newtonian system impressed the scientists, and the role of God was reduced to the initiator of the universe.

This change of attitude was partly due to the prevalence of religious disputes throughout Europe and partly due to the Galileo affair. But, there is no doubt that the strength of the new science in describing and explaining natural phenomena was the most effective factor in the emergence and propagation of deism in England – a view that bases our knowledge of God upon reason alone and considers the role of God as the creator of the universe.

Deism entered France from England, and with the consequent decline of its religious ingredient led to the French enlightenment of the second half of the eighteenth century. The

leaders of the enlightenment stressed the supremacy of human intellect, and were either atheists or believers in the natural religion.

In the eighteenth century two philosophers disputed the reliability of metaphysics. Hume (1711-1776) believed in empiricism and disputed the principle of causality and the argument from design for the existence of God. Kant (1724-1804), emphasized the limitations of pure reason and argued for the existence of God on the basis of practical reason: we must take God and immortality as basic principles to justify our moral behavior.

During the nineteenth century, theoretical physics progressed considerably, and so was chemistry. The advances in these two sciences led to significant advances in technology and promoted the industrialization of Western Europe. But it was the developments in biology which had more far-reaching effects on human thought. With the advent of the Darwinian theory of evolution, it seemed that biological sciences had found the key to their future development.

During the nineteenth century, several further currents of thought degraded the status of religion in the academic circles.

August Comte was the leader of a philosophical movement, called positivism. Comte emphasized on the scientific method as the only source of reliable knowledge and discounted metaphysics. He believed that religion is to be replaced by the religion of Humanity of which he considered himself to be the Prophet.

Karl Marx considered religion to be pure illusion and that belief in god or gods is an unfortunate by-product of the class struggle. In his view, religion ´ is the *opiom* of the people` - an escape route for the poor from economic misery and oppression (Marx, 1964/1844, 42).

Darwin's doctrine of the evolution of species was introduced in 1859. It was based on a mechanism, called natural selection, which involved random variations, struggle for survival and the survival of the fittest. Darwinism challenged Abrahamic religions on four accounts: (1) the fixity of species; (2) the argument from design for the existence of God; (3) the privilege of humans over other animals, and (4) the absolute significance of moral values. Darwin, an acknowledged agnostic (Barbour, 1997, 59) was cautious of criticizing religion, but his disciples, especially Thomas H. Huxley, criticized Christianity severely.

Durkheim considered religion to be a sociological phenomenon. Religious beliefs and rituals are symbolic expressions of social realities. Religion's true purpose is not intellectual but social. For example, the function of religious rituals is to remind individuals of their commitment to their community. Thus, theology is rooted in sociology (Pals, 1996, 88-118).

In the first half of the twentieth century two further currents disqualified religion.

Freud considered religion as ´ the universal obsessional neurosis of humanity` (Pals, 1996, 73), and attributed religious rites and convictions to the ignorance of early generations of humans (Pals, 1996, 54-83) He considered religion as the most serious enemy of science (Gay, 1987, 50).

Logical positivists of the 1920's considered sensations as the primary source of our knowledge and gave meaning only to experimentally verifiable statements. Thus,

metaphysical statements were considered meaningless as there is no way to verify them by sense experience.

In short, from the eighteenth century to the middle of the twentieth century various currents of thought discredited religion and, for that matter, the unphysical (spiritual) aspects of life. But, since 1950's we have been witnessing a weakening of positivistic and mechanical thinking and from the early 1970's there has been a visible motion towards the revival of religion and spirituality (in its general sense). Here we want to elaborate on the causes of this change. In our view, the following have been the main factors responsible for the resurgence of religion and spirituality.

1. The Negative Consequences of Modern Science

There is no doubt that modern science has brought a lot of blessings for human beings. But there is also no doubt that it has not generated felicity for mankind. It has not ended wars; it has brought up the pollution of the environment and it has provided mankind with destructive tools. Why has not science accomplished what the French enlighteners dreamed about? Why did the age of reason lead to the age of anxiety?

In response to these questions, some scholars have spoken of the change of direction of science in the post Renaissance period. Before the scientific revolution, the aim of science was the cognition of nature, as the work of God. But, after the scientific revolution, it was changed to the exploitation of nature. In Schumacher's view, there was a change from ´science for understanding` to ´ science for manipulation`. Modern science has neglected the ultimate questions of human concern, has limited science to the material domain, and has forgotten the higher levels of knowledge (Schumacher, 1977, 65-71).

In Schumacher's view, and in the view of many other people of wisdom, the remedy is the return to religion and to revive the spiritual dimension of mankind.

2. The Manifestation of the Individual-social Benefits of Religion and Spirituality

Various studies in the last three decades have shown that religion is effective in the reduction of crimes and in the improvement of mental diseases. There exists positive evidence for the effect of religious commitment on the mental and physical health of humans. Some research groups in America have shown that religious faith is one of the most effective agents in securing mental health and happiness (Larson & Larson, 1994), and that physical health has a spiritual dimension.

3. The Concussion of Reductionism

One of the prevalent ideas which has been a tool in the hands of opponents of religion is reductionism which has appeared in various forms.

(i) In ontological reductionism, one explains complex objects in terms of their constituents, and finally reduces everything to matter. Materialists have, through the ages, maintained that matter is the only fundamental reality of the world. The development of quantum theory, with its orthodox interpretation, weakened this picture. The

Copenhagen interpretation of quantum mechanics has idealistic overtones. Heisenberg, who was one of the founders of quantum theory, believed that in the struggle between Plato's idealistic philosophy and the materialistic philosophy of Democritus, modern physics has preferred Plato's position:

> This whole description agrees in every way with the central theme of Plato's idealistic philosophy. The fundamental structure in the phenomena is not given by material objects like the atoms of Democritus, but it is given by 'forms' by 'ideas' which determine the material objects. The ideas are more fundamental than the objects (Heisenberg, 1984/1970, 368).

The interpretive problems of quantum physics led some physicists to cast doubt on the limitation of reality to the empirical reality. Thus, e.g., Bernard d'Espagnat believes that we are dealing with two realities: an independent reality which is veiled from us and which is responsible for the order observed in phenomena, and whose description is beyond human intellect. The other one is the empirical reality which is a reflection of the independent reality and shows some of its features (d'Espagnat, 1979, 164).

W. Pauli, who was one the originators of quantum theory, finally reached the conclusion that we have to add a spiritual element to our picture of reality – an element which is complementary to the material one, and which is available through experimental science. This spiritual dimension cannot be obtained through rationalized knowledge (Laurikainen, 1987, 209-228).

The findings of quantum theory also led some physicist to go after Eastern mysticism (Restivo, 1978, 143-181).

Furthermore, some of the eminent scientists of our time believe that human consciousness is not explainable through physics and chemistry. Distinguished neuroscientist and Nobel laureate Sir John Eccles believed that consciousness exists independent of its physical ground:

> There is a fundamental mystery in my personal existence, transcending the biological account of the development of my body and my brain. That belief, of course, is in keeping with the religious concept of the soul and with its special creation by God (Brian, 1995, 371).

Heisenberg too believed that life or soul are not explainable in terms of the concepts of present-day physics:

> The concepts 'soul' or 'life' do not occur in atomic physics and they could not, even indirectly, be derived as complicated consequences of some natural law … If we want to describe living or mental processes, we shall have to broaden these structures. It may be that we shall have to introduce yet other concepts (as cited in Barrow, 1988, 303).

So is **R. Penrose**, who is suspicious that consciousness, or reality, can be explained by the current laws of physics (Horgan, 1997, 175).

(ii) In epistemological reductionism, the program is to reduce all sciences to one science (e.g. physics). This was the idea of logical positivists, when they talked about unified science. It is also the belief of many of the present-day scientists. Thus, e.g., Francis Crick talks of the reduction of biology to physics and chemistry:

> The ultimate aim of the modern movements in biology is in fact to explain all biology in terms of physics and chemistry (Crick, 1966, 10).

This view has been criticized on several grounds:

- In physics, it has become clear that one cannot reduce complex systems to their constituents completely. When we go from the components to the whole, new properties emerge. Thus, e.g., a solid is more than the sum of its atoms.
- Near the end of the nineteenth century, Hilbert started a movement to construct an axiomatic system which would be complete and free from contradictions and could account for the whole mathematics. In the early 1930's, Gödel demonstrated that in any axiomatic system which is rich enough to include arithmetic, there are meaningful statements whose truth or falsehood cannot be decided by the axioms and rules of the system (Barrow, 1998, 221-232). Gödel's theorem showed the breakdown of reductionism in mathematics. Now, because the whole machinery of present-day science is based on mathematics, one may conclude that in science we cannot have a theory of everything, and that science cannot explain all facts.

4. Practical and theoretical limitations of science

As our theoretical investigations and experiments have probed into sub-nuclear region, into strong gravitational fields and into very high energies and very low temperatures, it has become clear that there are severe limitations in our exploration of the universe. Here we mention just a few cases.

(i) The uncertainty principle of quantum mechanics provides an unsurpassable limitation for our ability to predict exactly the future of physical systems.

(ii) Chaos theory indicates that even without quantum uncertainty, the exact prediction of the future of a chaotic system is not possible.

(iii) The finitude of the velocity of light provides a limitation on what we can know about the entire universe. It is quite possible that our visible universe – i.e., the part of the universe that we could possibly see in principle today - may not give us enough information to characterize the laws of physics completely.

(iv) In the last two decades, there has been some speculations that our universe might have more than three spatial dimensions, to which we have no direct access.

(v)As we push forward into the macro domain or into the micro domain, the expenses for the required equipment increases out of proportion. Thus, the construction of

bigger and bigger accelerators for generating ultra high energy particles becomes more and more prohibitive.

5. Inability of Science to Answer Our Ultimate Questions

While science has given us enormous information about the micro-domain and the macro-domain, it has not been able to respond to the ultimate questions of human concern: What are we doing here? What is the purpose of life? Is there a telos to the universe? etc. Materialists believe that science will finally answer all such questions. In R. Dawking's words:

> So where does life come from? What is it? Why are we here? What are we for? What is the meaning of life? There is a conventional wisdom which says that science has nothing to say about such questions. Well, all I can say is that if science has nothing to say, it is certain that no other discipline can say anything at all. But in fact, science has a great deal to say about such questions (as cited in Poole, 1994, 57).

But there are many scientists or philosophers who are not theists but believe that science will not be able to answer such questions. Thus, as Peter Medawar, an agnostic and a Nobel laureate in medicine, put it:

> It is not to science, therefore, but to metaphysics, imaginative literature or religion that we must turn for answers to questions having to do with first and last things (Medawar, 1986, 60).

The same view is held by Karl Popper, an agnostic, who believes that:

> Science does not make assertions about ultimate questions- about the riddle of existence, or about man's task in this world (Popper, 1987, 141).

On the other hand, Arthur **Shawlow**, a believing physicist and a Nobel laureate, believes that:

> It seems to me that when confronted with the marvels of life and the universe, one must ask why and not just how. The only possible answers are religious (Margenau & Varghese, 1992, 105).

and so is **Alan Sandage** (one of the most distinguished cosmologists of our era):

> It was my science that drove me to the conclusion that the world is much more complicated than can be explained by science ... It is only through the supernatural that I can understand the mystery of existence (Science Finds God, 1998).

6. The Significance of Metaphysical Assumptions in Science

Up to the middle of 1950's, it was more or less accepted by scientists that science is free from metaphysical commitments. But, the developments in the philosophy of science have shown that metaphysical assumptions are used in theories, methodologies and problems of science, and that science is based on some assumptions which are vital for its activity but are not provable or refutable by science itself. Here, we mention some examples:

- There is an objective reality which is independent of our mind and which is responsible for our sense perceptions.
- We can explain nature through mathematics.
- Furthermore, metaphysical commitments are also important in the selection or the interpretations of theories. For example:
- In cosmology, those cosmologists who were supporting the steady state theory did not hide their motivation for the support of this theory: it was to dispense with the idea of God.
- Some biologists have interpreted the theory of evolution atheistically, though this theory admits theistic interpretation as well.
- Similarly, some religious ideas have been helpful in the genesis and the promotion of some important ideas in science. Thus, e.g., some of the eminent physicists of our time believe that the idea of the unification of natural forces is rooted in the monotheistic religions. As A. Linde put it:

> The idea that is possible to understand the universe through one ultimate ´ Theory of Everything` is an outgrowth of belief in one God (Scientists Move Beyond," 1998, B4)

7. Weakening of the idea of science–religion conflict

The idea of science – religion conflict dates back to the eighteenth century. But it got momentum after the Darwinian theory of evolution. Various reasons have been offered for this conflict:

- Science is based on empirical results and is backed by an objective reality, but religion is based on revelation whose acceptance is a matter of faith.
- Scientific theories are provable, whereas religious claims are to be accepted as a matter of faith.
- The subject, methodology, goal and language of science are different from those of religion.

Thus, science and religion are incommensurable, and, to say the least, they are independent. But materialists go even further than this and claim that these two are in conflict and that religion is a barrier to the progress of science.

But recent research indicates that the conflict thesis has various problems and that this thesis is based on some exaggerations: First, the founders of modern science were themselves sincere believers in God and they considered scientific activity as an act of worship. Second,

as we saw earlier, science itself is based on some unprovable assumptions. Third, not all of the discoveries of science are based on experimentation. Intuition has been the source of some very important discoveries. Fourth, Gödel's theorem has cast doubts about the completeness of physical theories. Fifth, science and religion refer to different aspects of a single reality.

8. Evidence for the Revival of Religion and Spirituality

We claimed that there has been a revival of interest to spirituality in general and religion in particular, in the last several decades. If, for the demonstration of this claim, we refer to the usual indices of religiosity – like the sale of religious books, participation in religious organizations and ceremonies, number of religions scholars or students or number of degrees granted in theology or religious sciences – we do not reach the same result in all cases. For example, while some of the liberal denominations have lost some membership, those denominations which have emphasized traditional values have gained in membership (Antoun & Hegland, 1987, 24) However, the sale of religious books, number of advanced degrees in theology and participation in religious instruction indicate an increase in the strength of organized religion (Antoun et al., 1987, 20).

If, however, we go over the aforementioned indices and look deeper into the status of religion in the academic circles, then we see a visible revival of interest in religious studies, and it is expected that this trend will propagate to the public. Of course, some societies and some eminent scholars have shown interest in private religion, mysticism and secular spirituality (i.e. spirituality without any religious base). For example, in Sweden or Switzerland we notice an increase of interest in the individualized religion or secular spirituality which accommodates certain values. On the other hand, there has also been a revival of interest in the study of theoretical and practical aspects of the institutionalized religion as well (which has a heavy layer of spirituality). Thus, e.g., we see a noticeable increase in the number of believing philosophers. In the academic circles or scientific journals too, we notice discussions about the interactions of science and religion – whereas these topics were 'forbidden` in these circles. Many scientists, who used to hide their religious attitude, now admit it publicly and have got involved with the problems at the interface of science and religion. There has also been a large number of seminars on the interface of science and religion in which scientists, philosophers and theologians have participated. Furthermore, a large number of science-religion courses have been offered at the universities throughout the world. Finally, an increasing number of journals are appearing which deal with the problems of this fast-growing interdisciplinary field.

Conclusion

As we saw due to the misuse of science in the applied domain and unwarranted extrapolations in the domain of theoretical science, which led to destructive effects and scientism, some eminent scientists of the second half of the twentieth century became concerned about the future of human felicity and civilization. Thus, some movements

started by some eminent scientists for the revival of religion and return to spirituality, and we saw the evidence for that in our foregoing discussion. The return to spirituality was both in the context of religion and without reference to it.

The spirituality, in the sense of search for meaning, deals, among other things, with the following questions:

1. Does the world covered by science describe the whole reality or there is an underlying reality that transcends the phenomenal world? In other words, are there any inherent limitations on the scope of scientific knowledge? Can, e.g., science explain moral order? The work of scientists and philosophers during the second half of the twentieth century indicated that there are inherent limitations in the scientific method. Science present us a mechanistic picture of the universe, but it provides no clues concerning the meaning of life, the ethical values, or our feelings.
2. Can human beings be totally understood by natural sciences or they have a supra-scientific dimension?
3. Is there any purpose in the universe or it is run by the rule of chance?

Regarding these questions, contemporary scientists can be divided into three categories:

(i) Some scientists like Dawkins think that science will finally answer all of these questions. While the founders of modern science saw their scientific work as the manifestation of God's Handiwork in the universe, these people stop at the phenomenal word.

(ii) Some scientists are concerned about these questions but do not attempt to answer them within a reference frame. These are called secular spiritualists. In a recent survey (Ecklund, 2010) done by the American sociologist Elaine H. Ecklund at America's 21 top research universities about spirituality, 60 percent of scientists described themselves as either atheist or agnostic, and 22 percent of the atheist scientists asserted that they have a sort of spirituality ,in the sense of finding beauty and awe in nature , ,awe in the birth of their children and awe in the work they do as scientists. Secular spiritualists have emphasis on compassion, tolerance, forgiveness, concern for others, … but they do not believe in any supernatural reality.

(iii) Some scientists believe that the aforementioned questions cannot be answered by science, and that for receiving a response one has to go beyond science. In the elegant words of Roger Penrose:

> The terminology 'theory of everything' has always worried me. There is a certain physicist's arrogance about it that suggests that knowing all the physical laws would tell us everything about the world. Does a physical theory of everything include a theory of consciousness? Does it include a theory of morality, or of human behaviour, or of aesthetics? Even if our idea of science could be expanded to incorporate these things, would we

> still think of it as 'physics, or would it even be reducible to physics (Penrose, 2005, 259)?

There are some eminent scientists – religious and non-religious (in the normal sense of the word) –who believe that for getting response to these questions one has to go to religion. In the words of John Barrow:

> Many of the deepest and most engaging questions that we grapple with about the nature of the universe have their origins in our purely religious quest for meaning. The concept of a lawful universe with order that can be understood and relied upon emerged largely out of religious beliefs about the nature of God (Barrow, 2006).

and as Freeman Dyson put it:

> The greatest unsolved mysteries are the mysteries of our existence as conscious beings in a small corner of a vast universe. Why are we here? Does the universe have a purpose? Whence comes our knowledge of good and evil? These mysteries and a hundred others like them, are beyond the reach of science. They lie on the other side of the border, within the jurisdiction of religion (Dyson, 2000).

In my humble view, science constitutes a valuable part of our life, but it cannot deal with all aspects of our human concerns, especially moral values and human responsibility. On the other hand, meanings, moral values and human responsibility make no sense in the absence of a reference frame (a grounding). Thus, we need a more comprehensive framework that not only accommodates science, but can also takes care of our ultimate questions as well as human beings' moral concerns. In other words, it can give a coherent explanation of the totality of human experience. Theistic world-view, especially the Islamic one, has such a capacity. It confirms the edifice of scientific enterprise, provides the basis for trusting scientific inquiry, and can accommodate the richness of human experience.

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