

The Sacred versus the Secular: Nasr on Science

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Nasr's work on science is discomfiting for many. His defense of traditional sciences is seen by his critiques as a nostalgic appeal to tradition with no real consequences for the current problems surrounding modern science. His unflinching attack on the philosophical foundations of modern science makes the modernists uneasy both in the East and the West. Furthermore, the evolutionary historians of science consider his notion of Islamic science too religious and metaphysical, suggesting instead a linear course of scientific evolution as if science without suppositions were to be possible. Part of this perturbed situation comes from Nasr's rigorous assertion of the religious view of the cosmos at a time when religion as a valid source of knowledge is no longer taken seriously even by its sincere adherents. Sailing against the grain, Nasr offers no apologies for his resolute stance and insists on questioning the received meaning of science. Consequently, Nasr's approach to science from a religious point of view suggests a new way of looking at the vexed question of religion and science. This essay, however, will confine itself to a critical analysis of Nasr's concept of science both in its traditional sense and modern form.

A quick look at Nasr's wide-ranging works shows that the question of science occupies a central place in his thought. Following a two-fold strategy, Nasr does not remain content with the critique of modern Western science, and presents his alternative view of science on the basis of traditional doctrines. The heavy emphasis put on the distinction between the traditional and the modern, or the sacred and the profane, runs through Nasr's work which comprises many facets of traditional and modern sciences. A considerable number of his works are thus devoted to the exposition of traditional

sciences, the metaphysical and cosmological principles on which they are based, and their meaning for a day and age that tends to see them as no more than superstitions and old wives' tales. The second part of Nasr's work is focused on modern science, its historical formation, its philosophical premises and claims, and the catastrophic events brought about by the unquestioned acceptance of modern science and technology. In both of these fields, Nasr stands out as a rigorous practitioner of the traditional school, and presents a profound evaluation of the traditional and modern natural sciences from the point of view of traditional doctrines. This can best be seen in his insistence on the necessity of *scientia sacra* and the revival of pre-modern cosmologies that the traditional civilizations have produced over the centuries. Being the application of a number of metaphysical principles expounded by the traditional school and especially by Rene Guenon, Nasr's critique of modern science is accordingly motivated neither by a purely utilitarian impulse nor by a mere academic and historical interest. Rather, his uncompromising defense of traditional sciences on the one hand, and relentless attack on the philosophical claims of modern science on the other, is to be seen as an encounter between the traditional and the modern at the metaphysical level as it pertains to the domain of natural sciences.

It is, therefore, important to note at the outset that Nasr's critique of modern science is marked off from the current criticisms leveled against modern Western science by its metaphysical and religious stance. According to Nasr, modern science is an anomaly not simply because we have to pay a high price by destroying the natural environment but because it operates within a seriously misguided framework in which everything is reduced to pure quantity and by which the modern man is made to think that all of his problems from transportation to spiritual salvation can ultimately be solved by further progress in science. The high cost of the scientific fallacy is to make spiritual realities appear as unreal and redundant, or at least not relevant to the world-picture presented by modern science. In sharp contrast to this naïve belief in science and progress which has come under severe attack especially after World War II, Nasr aims at analyzing and questioning the very foundations upon which modern science as the pseudo-religion of the modern age is based. In this regard, one may argue that Nasr's work is not so much concerned with the philosophy of science in the current sense of the

term as with the metaphysics of science, viz. the metaphysical framework in which science, be it modern or pre-modern, is to be understood and given its due place in the hierarchy of knowledge. For Nasr, it is the availability or absence of such a metaphysics that makes science modern or traditional.

Thus, Nasr's highly critical stance towards modern science can best be understood in the light of his notion of sacred science which might be described, very briefly, as an application of the One and the Absolute to the plane of relative existence. In fact, Nasr's central claim that the rise of modern Western science is not the result of some groundbreaking advancements in scientific measurement but rather a direct consequence of the rise of a certain philosophy which underlies the formation of modern science from the 17th century onward can also be read as an extension of his view of sacred and traditional sciences which share a metaphysical outlook entirely different from that of modern science. To use a familiar distinction from the contemporary philosophy of science, Nasr concentrates his criticisms on the context of justification rather than on the context of experiment. In other words, Nasr's work on modern science is not so much concerned with the actual conditions of scientific experiment and measurement, a subject dear to many scientists and philosophers of science, as with the larger framework of meaning in which the findings and the philosophical foundations of modern natural sciences are to be examined.

In what follows, I shall give first a brief description of Nasr's defense of what he calls sacred science. By focusing on the concept of *scientia sacra*, we will be able to gain insight into the metaphysical framework in which traditional sciences, whether Hindu, Chinese or Islamic, were constructed and transmitted. The relevance of metaphysical doctrines of world religions for traditional sciences will thus form an important part of our discussion. The second part of the essay will focus on Nasr's criticism of modern Western science which, in the eyes of Nasr, is the primary cause of the secularization and desacralization of the order of nature. It is, however, extremely important not to lose sight of the fact that Nasr is not opposed to science itself but to its philosophical claims that apparently exceed its legitimate boundaries. Keeping this in mind, our analysis will also provide us with a chance to distinguish between the philosophy and metaphysics of science with which Nasr's work is primarily concerned.

***Scientia Sacra* Defined and Defended**

Nasr defines *scientia sacra* as 'that sacred knowledge which lies at the heart of every revelation and is the center of that circle which encompasses and defines tradition'.²⁰¹ *Scientia sacra*, whose Latin form Nasr insists on keeping, denotes the supreme science of metaphysics which comprises the principal knowledge of things whereas sacred science refers to the application of sacred knowledge to various domains of reality, physical and spiritual. Any science, be it natural, mathematical or intellectual, that places the sacred at the center of its structure is sacred to the extent that it is an application of the immutable principles of metaphysics to the world of change and relativity.²⁰² In this regard, all sacred sciences are also traditional sciences in the sense that they apply the principles of traditional metaphysics to the scientific study of nature and thus can be called different versions of applied metaphysics.²⁰³ Grounded in this view, all sacred sciences from cosmology to medicine share a number of cardinal principles which Nasr outlines as follows: the sacred sciences construe the world through the prism of a hierarchy of being and knowledge. The physical world is not denied as an illusion, as *maya*, or as a shadow to be degraded in face of the Absolute. Nor is it taken to be an ultimate reality in and of itself. It is rather placed within a larger framework of meaning and significance that does not confine existence to any particular scientific construction. The traditional civilizations in which the sacred sciences were cultivated insist on the Divine origin of the world, and this view leads to a clear-cut relationship of hierarchy between the absolute and the relative, the eternal and the temporal, the necessary and the contingent. Since hierarchy implies, by definition, a multi-layered structure, the traditional sciences are essentially anti-reductionist. This explains, to a large extent, the persistence of the idea of the 'great chain of being' across the traditional civilizations which do not allow the reduction of reality into a pure idea or pure matter as

²⁰¹ *Knowledge and the Sacred* (Albany: SUNY Press, 1989), p. 130.

²⁰² *The Need for a Sacred Science* (Albany: SUNY Press, 1993), pp. 1-2.

²⁰³ Not all traditional sciences are, however, sacred. There is always a human element attached to the formulation of traditional sciences which cannot be taken to be sacred in the strict sense of the term. For Nasr's distinction between the two, see *The Need for a Sacred Science*, p. 96.

these terms are currently understood.²⁰⁴ Instead of relegating reality to a lower plane of existence, namely to matter, the sacred sciences analyze each domain of reality in its own level, thus resting on a metaphysical framework within which it is possible to maintain the vision of the One and the many without confounding the two.

In this view, nature, the very subject matter of science, is regarded as a sacred being, as *vestigia Dei*, or as *ayat Allah*, e.g., as the signs of God which point to the 'symbolic significance' of the world of nature. In sharp contrast to the modern view of nature which reduces the order of nature to everlasting change and impermanence, the traditional sciences look upon nature as the abode of both change and permanence. Although the common-sense experience tends to see nature as a perennially changing structure, the world of nature displays also a remarkable continuity, perseverance and harmony as we see it in the preservation of the species and the endurance of natural forms. For Nasr, this double-aspect of nature proves beyond any doubt the Divine quality in nature: the world of nature has not been left to the infinite succession of haphazard and senseless changes which admit no *telos* in the cosmos. On the contrary, nature contains in itself the principles of change and permanence simultaneously and points to a 'big picture' in which all of its parts are recognized as forming a meaningful unity and harmony. As Titus Burckhardt reminds us, 'the Greek word *cosmos* means 'order', implying the ideas of unity and totality. Cosmology is thus the science of the world inasmuch as this reflects its unique cause, Being.²⁰⁵ Defined as such, the order of nature or the cosmos cannot be other than the reflection of a higher principle on the level of relative existence.^{206[6]}

Cosmos as a self-disclosure of the Divine can be grasped, according to Nasr, only by what F. Schuon calls the 'symbolist spirit' which has been lost in the modern world. The symbolist outlook shared by all the traditional sciences is based on the epistemological premise that the reality of things is more than how it appears to us.^{207[7]}

²⁰⁴ The best historical account of the great chain of being is A. Lovejoy's *The Great Chain of Being: A Study of the History of an Idea* (New York: Harper Torchbooks, 1960).

²⁰⁵ Titus Burckhardt, *The Mirror of the Intellect: Essays on Traditional Science and Sacred Art*, tr. by William Stoddart (Cambridge: Quinta Essentia, 1987), p. 17.

²⁰⁶ Nasr gives a detailed analysis of this point in his works on Islamic science. Especially his *Introduction to Islamic Cosmological Doctrines* has been devoted to the concept of nature and the methods used for its study by Ikhwan al-Safa, al-Biruni and Ibn Sina.

²⁰⁷ This epistemological claim has far-reaching consequences for our relationship with the world and with other human beings. Unfortunately, there is no space here to delve into this important subject. One may,

Just as the reality of God is not limited to His creation, the reality of the natural world is also not confined to the analysis and classification of natural sciences. In fact, the meaning of the cosmos can be made explicit only when one sees it as more than its quantitative sum. A crucial implication of this premise is obviously the rejection of modern empiricism: since reality is not exhausted by its experimental analysis, there has to be an 'intellectual' principle that organizes and guides what is experienced by the five senses. Left unto itself, the sum total of experimental data, however 'thick' and informative it might be, does not constitute a whole or unity by which we can understand and describe the world. In fact, pure empiricism as a way of dealing with the world of nature is not a possibility because there is always an element of intellectual knowledge involved in any scientific enterprise undertaken.²⁰⁸ In other words, the choice of the scientist to deal with a particular domain of reality by using certain scientific instruments is not a theory- and value-free endeavor. The context of experiment, despite its operational nature, is always the context of a number of choices, judgements and evaluations that the scientist has in the background of his work. The task of the metaphysics of science, as we observe it in the work of Nasr, is precisely to provide and clarify these principal ideas and judgements through which all natural sciences, whether traditional or modern, function. As a result of the presence of such a metaphysics, the traditional notion of experiment in the natural sciences has a field of meaning completely different from and incommensurable with its modern counterpart. That is why the traditional sciences which Nasr, together with the other members of the traditional school, defends against modern science have never allowed the rise of reductionist empiricism despite the epoch-making achievements of traditional sciences in such experimental fields as medicine, astronomy, mechanics and alchemy.²⁰⁹

Modern empiricism or what Guenon calls 'l'experimentalisme moderne' differs completely from the traditional notion of experiment since it is not only reductionist but

however, refer to Huston Smith's concise discussion in his *Forgotten Truth: The Primordial Tradition* (New York: Harper and Row, 1967), pp. 96-117.

²⁰⁸ In contemporary philosophy of science, this issue has been discussed around the question of whether we can have observation without theory. As the realists and the instrumentalists alike agree on, scientific observation is always theory-laden and this does not necessarily undermine the scientific validity of observation within a particular science.

²⁰⁹ For an illustration of this point, see Nasr's *Islamic Science An Illustrated Study* (Kent: World of Islam Festival Publishing Company Ltd., 1976), and *Science and Civilization in Islam* (Cambridge, 1987).

also flawed in its most essential assumption that theory has to be checked against the backdrop of a number of experimental conditions. Guenon puts into question this very assumption and claims that to give priority to experiment detached from the theoretical setting in which it is constructed is to reverse the relation between theory and experiment. For Guenon, it is the illusion of modern experimentalism to believe that 'a theory can be proved by facts whereas in reality the same facts can always be explained equally well by a number of different theories, and it would not be possible, as some of the defenders of the experimental method like Claude Bernard have recognized, to interpret these facts without the help of some 'preconceived ideas' without which these facts remain as 'brute facts', devoid of any significance and scientific value.²¹⁰ Set against this background, the traditional sciences that employ the experimental method always function within a framework of metaphysical principles the most important of which is, for Nasr and the traditional school, the hierarchy of being and knowledge.²¹¹ It is the recognition of this hierarchy that exists objectively and independently of the knowing subject that prevents the traditional sciences of nature from falling into the trap of reductionist empiricism.

The traditional notion of scientific experiment brings us to another fundamental issue in the natural sciences, which is the question of scientific realism. Although neither Nasr nor the other exponents of the traditional school speak about realism in terms similar to the ongoing discussion in contemporary philosophy of science, it is possible to argue that Nasr takes a realist position on the meaning and function of natural sciences. The common-sense definition of realism as the acceptance of an objective world not dependent on our perceptions is, one may claim, uninteresting and even boring²¹², and it would not be wrong to say that it does not yield any substantial knowledge about the structure of the world around us. Yet, this seemingly simple truism entails a far-reaching thesis concerning our consciousness of the world.

²¹⁰ Rene Guenon, *La Crise du Monde Moderne*, (Gallimard, 1946), pp. 76-77.

²¹¹ Although one may cite tens of classical books and treatises on the hierarchy of being and knowledge, two contemporary works are worth-mentioning here: E. F. Schumacher, *A Guide for the Perplexed* (New York: Harper and Row, 1977), especially, pp. 15-25; and Huston Smith, *Forgotten Truth: The Primordial Tradition* (New York: Harper and Row, 1967), especially, pp. 34-59.

²¹² Michael Devitt, *Realism and Truth*, (New Jersey: Princeton University Press, 1997), 2.nd edition, pp. 13-14.

Putting aside the conflicting views on the subject, we may characterize this assertion along the following lines. According to a fundamental axiom expounded by the traditional school, man is in principle capable of knowing God and the world through his intellect which is a God-given faculty. In sharp contrast to Kantianism and other forms of rationalism, the possibility of metaphysics as an all-inclusive science stems from the faculty of the intellect whose function is to integrate and know the higher levels of reality. Whereas reason by its nature analyzes and dissects the world around it into fragments in order to function properly, the intellect synthesizes and integrates what has been fragmented by the reason. The same principle applies, one may argue, to the natural sciences in the sense that the quantitative study of the cosmos is complemented by the qualitative and 'symbolist' perception of the intellect.²¹³

Nasr's realist position comes to the fore with his depiction of science as an organized body of knowledge that is in principle capable of describing the world to us as it is. Guided primarily by the supreme knowledge of metaphysics, science can and does investigate the reality of physical entities as they exist objectively in the extra-mental world. This suggests that scientific theories are not mere instruments of operation by which the scientist constructs a picture of the world without having an actual grasp of it.²¹⁴ On the contrary, what science presents to us as a world-picture is in fact a true picture of the world provided that it is substantiated by sound evidence and that it does not lose sight of the hierarchic vision of the universe. As in the case of scientific experimentalism, this minimal or common-sense view of scientific realism is

²¹³ The distinction between reason and intellect on the one hand, and their unity at a higher level of consciousness on the other, are the two fundamental tenets of the traditional school. For Nasr's exposition of these terms, see his *Knowledge and the Sacred*, chapter 1.

²¹⁴ For Nasr's critique of scientific instrumentalism which is a version of anti-realism, see *Man and Nature: The Spiritual Crisis in Modern Man* (ABC International Group, Inc., 1997), pp. 25-27. At this point, it should be mentioned that Glyn Ford's defense of Islamic science, which is based on his interpretation of Nasr, appears to rest on a misreading of Nasr. Ford defines science as a social construction of natural phenomena mediated by the scientific community and society with no claim to objectivity -- a thesis promulgated, *inter alia*, by Kuhn and Feyerabend. In this sense, every scientific tradition, modern Western, Islamic or Chinese, is entitled to be science notwithstanding their conflicting claims of truth and validity. It is not difficult to see the anti-realist component in this assertion: Islamic science is a valid science not because it is based on the scientific study of nature but because it is one of such social constructions that we collectively agree to call 'science'. As I have tried to show here, Nasr does not subscribe to such an anti-realist interpretation of science. For Ford's argument, see his 'A Framework for a New View of Islamic Science' in *'Adiyat Halab An Annual Devoted to the Study of Arabic Science and Civilization*, (Aleppo: The University of Aleppo, 1978-1979), vols. VI-V, pp. 68-74.

supplemented by what one may call a 'metaphysical realism' in that the scientific realism in question is gained not through the operation of the senses and reason alone but primarily through the intellect which is the locus of metaphysical knowledge for intellectual as well as natural sciences. The fact that science can present to us a true picture of the world is to be seen not as an exclusive brilliance of scientific theories or experimental devices but as a possibility of the intellect because it is through the intellect that we make sense of the world with which the sciences are concerned. Said differently, what makes the quantitative study of the universe possible is the intellect's ability to understand the reality of things as they are, namely as the plane of relative existence in face of the Absolute, to the extent possible within the confines of human ability.²¹⁵ It is this metaphysical component that separates realism, as it is defined here, from both positivism and physicalism.²¹⁶

Nasr's ground-breaking work on Islamic science can be taken as an example to illustrate the foregoing points.²¹⁷ The Islamic natural sciences cultivated in Islamic civilization by Muslim scientists were based on a careful and analytic study of nature within the matrix of the Islamic revelation. The essence of this revelation is *al-tawhid*, the principle of unity professed by every member of the Islamic community, which underlies, as Nasr repeatedly states, the unity and interrelatedness of the world of nature. Although

²¹⁵ In a famous prayer, the Prophet of Islam asks God to 'show him the reality of things as they are in themselves' (*arini haqaiq al-ashya kama hiya*). This prayer which has been elaborated upon by many Muslim scholars and philosophers suggests that the ultimate reality and meaning of things can be attained only through the aid of Divine guidance. Placed within a larger context, the same principle applies to the proper understanding of the order of nature.

²¹⁶ There is no intrinsic or necessary connection between realism in science and belief in progress. Nevertheless, historically, the majority of those who take the realist position have allowed some kind of a belief in progress which accounts for the linear development of natural sciences. By contrast, most of the anti-realists and instrumentalists, notably Kuhn, Feyerabend and Van Fraassen, have rejected the idea of progress by replacing cumulative development in science with paradigm shifts that alter the very definition of science. Interestingly enough, both Guenon and Nasr reject the idea of progress as an intrinsic quality of natural sciences. In this regard, Guenon goes even further and describes the development of chemistry from alchemy and astronomy from astrology as 'degeneration' rather progress and evolution -- degeneration in the principles that make alchemy, astrology or the science of the soul (*ilm al-nafs*) traditional sciences. The denial of progress in natural sciences as this term is understood currently is obviously the logical result of the metaphysical outlook that Nasr expounds and defends as a prominent member of the traditional school. For Guenon's remarks, see *La Crise*, pp. 79-81.

²¹⁷ Nasr has authored a number of important works on Islamic science. See his *Islamic Science - An Illustrated Study* (Kent: World of Islam Festival Publishing Company Ltd., 1976), *An Annotated Bibliography of Islamic Science* (Lahore: Suhail Academy, 1985) 3 vols, *Science and Civilization in Islam* (Cambridge, 1987), *An Introduction to Islamic Cosmological Doctrines* (Cambridge, 1964). Nasr has also written many articles on the meaning of Islamic science and its relation to modern Western science.

al-tawhid in its ordinary sense refers to the theological dictum that there is no divinity but God, its ontological and metaphysical meanings enter the picture as a corollary of it by construing the world of nature as issuing forth from a single source, e.g., from the Divine. For Nasr, the primary goal of Islamic sciences from medicine to geometry is to disclose this underlying unity and to show 'the unity and interrelatedness of all that exists'.²¹⁸ Seen from this point of view, reality presents itself to us as a well-knit unity in which the individual objects as the subject matter of science are located.²¹⁹ A supposedly 'pure' analysis of the natural world into its constituent parts does not help us understand these discrete parts because each analysis, whether scientific or philosophical, is carried out within a context in which the terms of the analysis are given. Furthermore, each part by definition requires a whole or unity in relation to which alone it can be called 'part'. The distinct characteristic of Islamic sciences, claims Nasr, is to admit this pre-conceptual and relational unity as a given fact and reveal the balance between the whole and the part, and between the one and the many. This is also one of the fundamental differences between the metaphysical framework of Islamic science and its modern counterpart.²²⁰

Following the same line of argument, it is possible to contend that the 'facts' of science are not derivable from an analysis which is thought to be detached and isolated from the multi-layered contexts of meaning. In fact, as Nasr insists on the necessity of an all-inclusive metaphysical matrix in which any scientific activity is to be conducted, science, be it traditional or modern, represents a prime example of what Ryle calls 'thick description', viz. the analysis of the layers of meaning within which an activity is carried out. Now, one of the merits of Islamic science is to unveil the persistence of such layers of meaning that run through the various levels of scientific activity while at the same time explicating the tacit unity and interrelatedness of natural phenomena. The 'unifying perspective of Islam'²²¹ in which the Islamic sciences are deeply rooted defines the 'facts' of science not as atomistic quanta but as relational entities that tie the entire cosmos

²¹⁸ *Science and Civilization in Islam*, p. 22.

²¹⁹ *Ibid.*, p. 25.

²²⁰ In addition to Nasr's aforementioned works on Islamic science, see also his brief treatment in *A Young Muslim's Guide to the Modern World* (Cambridge: The Islamic Texts Society, 1993), pp. 85-102.

²²¹ *Islamic Science*, p. 4.

together.²²² A crucial implication of this 'metaphysics of relationality', if I may use such a term, is the denial of pure and simple ideas which the empiricists such as Hume have conceived of as the constitutive elements of human thought. The so-called pure and simple ideas of human mind always assume a 'thick' setting in which they are formed and expressed. The same holds true for the sense-data and/or sense-perception which is always embedded in a context of intelligibility larger than mere sensation. In fact, according to the idea of *asalat al-wujud*, the primacy of being over essence (*mahiyyah*), which Nasr expounds in many of his writings, Being is the standing condition of all knowledge. In other words, every act of knowing, whether based on the senses or the intellect, presumes a larger context of intelligibility provided by the all-inclusive reality of Being. It is on the basis of this 'existential' ground rather than some physical or ether-like element that we can talk about the cosmos as an interrelated unity.

This substantive unity, however, becomes comprehensible only through the aid of the intellect which integrates various domains of reality as opposed to quantitative analysis which remains at the steps of fragmentation and dissection. For Nasr, the remarkable achievements of Islamic sciences were made possible by the availability of such a comprehensive outlook that has determined both the context of experiment and of justification of the traditional natural sciences.^{223[23]} This is also the demarcation line between the sacred and modern science that has adopted an entirely different perspective, to which we now turn.

Modern Science: the Triumph of the Secular

It is now common wisdom that the rise of modern science was not a natural result of some technological advancements that took place in Western Europe in the 16th and 17th centuries. The formation of modern science was rather the end-result of a number of philosophical and metaphysical changes that have altered humanity's view of nature and science in an unprecedented way. In this sense, modern science represents a radical shift

²²² Sadr al-Din Shirazi, one of the greatest metaphysicians of the post-Avicennan Islamic philosophy, on whom Nasr has written extensively, depicts the natural phenomena as 'pure relations' (*idafa mahda*) when seen in relation to the absolute (*al-mutlaq*) and the necessary Being (*al-wajib*), which is God.

²²³ A thorough survey of Islamic sciences ranging from geography and natural history to physics and astronomy is to be found in *Science and Civilization in Islam*.

from the traditional notion of *scientia*-- a shift from the sacred evaluation of nature to a secular and profane framework in which pure quantity is taken to be *the* reality. With this new outlook, nature is divested of its symbolic and sacred meaning, and the scientist becomes the sole arbiter of truth. For Nasr, the legitimation crisis of modern science stems from this new and 'alien' perspective that has led, among other things, to such global calamities as the environmental crisis and nuclear warfare. Accordingly, Nasr's relentless attack on modern science is focused on the analysis and critique of the errors of this philosophical purview rather than being a sentimental attack on modern science itself as it is commonly and mistakenly assumed. In this regard, Nasr's encounter with the intellectual premises of secular Western science can be interpreted as an archeology of modern science whose roots go back to the 17th century scientific revolution.

Five main traits of modern science come to the fore in Nasr's critical analysis. The first is the secular view of the universe that sees no traces of the Divine in the natural order. Nature is no longer the *vestigia Dei* of Christian cosmology but a self-subsistent entity that can be encapsulated exhaustively in the quantitative formulae of natural sciences.²²⁴ The second feature is the mechanization of the world-picture upon the model of machines and clocks. Once couched in terms of mechanistic relations, nature becomes something absolutely determinable and predictable -- a much needed safety zone for the rise of modern industrial society and capitalism. The third aspect of modern science is rationalism and empiricism as we have alluded to before. The fourth trait is the legacy of Cartesian dualism that presupposes a complete separation between *res cogitans* and *res extensa*, viz., between the knowing subject and the object to be known. With this cleavage, the epistemological alienation of man from nature comes to completion by leaving behind a torrent of pseudo-problems of modern philosophy, the notorious mind-body problem being a special case in point.²²⁵ The last important aspect of modern science is in a sense a culmination of the foregoing features, and it is the exploitation of

²²⁴ In a famous anecdote of the history of science, Laplace, explaining his model of the universe to Napoleon, declares God as a 'redundant hypothesis'. For Laplace's famous reply that 'I had no need of that hypothesis' see, Roger Hahn, 'Laplace and the Mechanistic Universe' in *God and Nature*, ed. David Lindberg and Ronald Numbers, (Berkeley and Los Angeles: University of California Press, 1986).

²²⁵ Rorty goes so far as to attribute the 'invention of the mind' to Descartes and his cogito which has come to be the source of modern theories of knowledge and the ill-formulated mind-body problem. See his *Philosophy and the Mirror of Nature*, (New Jersey: Princeton University Press, 1979), p. 17ff.

nature as a source of power and domination -- a fact not unknown to modern capitalist society. Now we can see, in a brief manner, how these aspects of modern science figure in Nasr's critical analysis.

What came into being with the Scientific Revolution was a new way of looking at the world in the deepest sense of the term. Nature was no longer conceived as a being of sacred significance with its own life cycle and unity not to be destroyed by man's desire to establish a fake paradise here on earth. The humanist ideal of bringing down heaven to the terrestrial domain was deemed possible only by turning nature into a stage in which the destiny of mankind was to be decided in isolation from the Divine dictums of Christianity or any other religion. The historic break away from the religious view of the universe marks the incubation of modern secularism that claims to account for all the dimensions of nature by reducing it to pure quantity and a soul-less machine. For Nasr, this secular view of the universe underlies the most essential characteristics of modern science. Once translated into the language of pure quantities, nature becomes devoid of any intrinsic meaning and intelligibility whereby all the qualitative aspects associated with the natural phenomena such as beauty, harmony, *telos* and intelligibility turn into what Galileo called the 'secondary qualities', namely the subjective feelings of humans with no corresponding reality in the extra-mental world.²²⁶ Galileo's distinction between the primary and secondary qualities has also laid the foundations of modern empiricism: reality is what can be measured quantitatively, and it is only through the channel of empirical science that access to 'reality' defined as such can be gained.²²⁷ Hence, science deals with a domain of reality with no meaning and value in and of itself. As Collingwood rightly points out, this view excludes God as well as man from the world of

²²⁶ The distinction between the primary and secondary qualities made by Galileo is one of the foundations of the Scientific Revolution. This issue was later taken up in philosophy by Hume and became one of the pillars of modern empiricism. For the importance of this distinction, one may refer, among others, to the following: R. G. Collingwood, *The Idea of Nature*, (Oxford: Oxford University Press, 1945), pp. 102-105; Wolfgang Smith, *Cosmos and Transcendence Breaking Through the Barrier of Scientific Belief*, (Illinois: Sherwood Sugden & Company, 1984), pp. 15-16; Alexander Koyre, *From the Closed World to the Infinite Universe*, (Baltimore: The Johns Hopkins University Press, 1957), pp. 88-109; S. H. Nasr, *Religion and the Order of Nature*, (Oxford: Oxford University Press, 1996), pp. 136-138; Ian Barbour, *Religion and Science Historical and Contemporary Issues*, (San Francisco: Harper San Francisco, 1997), pp. 9-17; E. Burt, *The Metaphysical Foundations of Modern Physical Science* (New York: Doubleday Anchor Books, 1932), pp. 83-91.

²²⁷ For an account of Galileo's distinction from this point of view, see Herbert Butterfield, *The Origins of Modern Science 1300-1800*, (New York: The Free Press, 1968), pp. 99-102.

nature in that both God and man are seen as conferring meaning upon nature *ex post facto*, thus rendering nature into inert matter.²²⁸ Consequently, this leads to the glorification of the human mind as the sole locus of meaning and value, and thus slips into a gross subjectivism. Nasr rejects this subjectivism, insists on the intrinsic qualities of nature, and makes the bold epistemological claim that the world of nature, or the external world, displays certain qualities intrinsic to itself, which cannot be confined to the feelings or the cognition of the knowing subject. Said differently, the qualities that we associate with the natural phenomena are not simply the results of some psychological states but rather to be seen as constitutive of what we experience.²²⁹ Placed within this framework, the world of nature appears to be of sacred quality in and of itself and not necessarily dependent on our perceptions of it.

This view has important implications for the so-called 'bare facts', the temple of all the positivists, that supposedly replace the metaphysical and philosophical suppositions of pre-modern sciences with the 'facts' of natural phenomena. As I have stated earlier, the myth of neutral fact free from any context of meaning and value has to be abandoned as inadequate. This, then, puts into question one of the fundamental premises of the secular view of nature that the 'bare facts' of science leave no space for religious or artistic truth and that what is out there in the world of nature is no more than aggregates of chemical and biological elements upon which the human mind antecedently confers meaning. As Nasr repeatedly states, the projection of nature as pure *materia* is a reflection of the secular outlook of modern science in which a 'suppositionless' encounter with the world is pushed to the limits of relegating nature into a structure of brute facts with no meaning and even practical use.

It is not a difficult step to take from a nature conceived as inert and essentially devoid of meaning to a nature constructed upon the model of machine and, later with Newton, of clock. The purpose of this analogy, as we all know, was to prove the precision of modern natural sciences and to substantiate man's claim for absolute domination over nature. The myth of the determinate and predictable state of things was a

²²⁸ Collingwood, *ibid.*, p. 103.

²²⁹ On the traditional school's view of quality and quantity as two philosophical categories, see Rene Guenon, *The Reign of Quantity and the Signs of the Time*, tr. by Lord Northbourne, (Luzac and Company Ltd), 1953, pp., 19-32.

necessary assumption for the operation of natural sciences -- a myth shattered by the rise of quantum mechanics and sub-atomic studies.²³⁰ In any case, nature had to be construed as a machine in the full sense of the term so that the rise of industrial society could go ahead without any serious objection from religion or society, both of which were already made submissive to the undisputed authority of science. Interestingly enough, the very model through which the bare facts of nature were to be discovered proved to be a clear indication of the philosophical outlook adopted by modern science: 'machine' or 'clock' is certainly not a phenomenon to be found in nature but rather an invention of modern industrial society. Nasr sees the disastrous effects of the mechanistic view of the cosmos in this misconceived belief in science that has led to the eclipse of traditional ideas and values on the one hand, and to a number of modern disasters on the other. In addition to that, Nasr also insists that thinking about nature in terms of machines is not the best way to deal with natural phenomena. As the history of pre-modern sciences shows, it is possible to study and make use of nature without subscribing to a mechanistic world-view in which the intrinsic value of nature and everything in it is deemed inconsequential for the progress of human society.

The third important trait of modern science is, for Nasr, rationalism and empiricism which, in spite of their historical rivalry, complement each other in a number of surprising ways. First of all, both rationalism and empiricism as the two progenies of the Enlightenment reject the great chain of Being, namely the hierarchic view of the universe which lies at the heart of traditional sciences. Instead, modern rationalism constructs a world-picture within the limits of reason alone while empiricism takes a similar position by reducing reality to the least common denominator, i.e., the sense experience. The philosophical roots of Enlightenment humanism can thus be traced back to this epistemological strait-jacket imposed upon our perception of the world by rationalism and empiricism. Secondly, both of these schools take the knowing subject,

²³⁰ The idea of determinism and prediction has been influential not only in the natural sciences but also, and more perniciously, in the social sciences. The best example of this is social Darwinism and behaviorism as evidenced in the work of Pavlov in the former Soviet Union and that of B. F. Skinner in the United States. Set against the background of their ideological assumptions, both the experiments of Pavlov and Skinner's *Beyond Freedom and Dignity* present an interesting example of will to power and domination: both claim to have discovered the 'technology of behavior' -- a much-needed device for any oppressive political system. For William Barrett's analysis of this anomaly, see his *The Illusion of Technique: A Search for Meaning in a Technological Civilization*, (New York: Anchor Books, 1979), pp. xi-xv.

the *cogito* of Descartes, to be the sole possessor of meaning and intelligibility thus paving the way for a subjectivist epistemology. Although the cosmology of modern science at the hands of Galileo supposedly invalidated the Christian view of the universe that regarded the world as the center of the cosmos, modern epistemology put the modern man back at the center by assigning to him the role of being the Promethean 'creator' of the world.²³¹ Thirdly, both rationalism and empiricism adopt what E. Nagel calls the 'view from nowhere' standpoint according to which man is disengaged from the world in which he is ineluctably included and able to see the world by himself from a God-like vantage point.²³² As I have mentioned earlier, modern rationalism, according to Nasr and the traditional school, rests on a serious misunderstanding of the notion of 'reason' when it relegates the intellect to calculation and analysis. Modern empiricism, on its part, falls into a similar predicament by repudiating any principle higher than sense perception.

The fourth distinguishing characteristics of modern science is closely related to both rationalism and empiricism, and this is the legacy of Cartesian bifurcation which draws an ontological and epistemological abyss between the knowing subject and the object to be known. With this rupture, the knowing subject is veiled ontologically from the world surrounding it and bound to look at everything as an 'other' including nature and 'other minds'. Historically, the epistemology of 'othering', the inevitable offshoot of Cartesian dualism, has been one of the key factors for the alienation of man from nature and the destruction of the natural environment. It is not surprising to see that the decimation of natural resources coincides with the rise of colonialism and Orientalism, both of which are grounded in the creation of 'others' as the unavoidable costs of Western domination. Nasr sees the roots of this modern predicament in the Cartesian heritage and argues very strongly for what we may call an 'epistemology of unity', according to which

²³¹ The tragic consequences of Promethean humanism have been noticed by many philosophers of the West as well as the East. Nasr has written on the subject extensively, employing a rigorously critical language. Among others, Heidegger, in his celebrated attack on humanism in Letter on Humanism, offers a scathing criticism of Western humanism which has turned man, according to him, into a slave of his own inventions.

²³² 'The attempt is made to view the world not from a place within it, or from the vantage point of a special kind of life or awareness, but from nowhere in particular and no form of life in particular at all.' Thomas Nagel, *Mortal Questions*, (Cambridge, 1979), p. 208.

the unity between the intellect and the intelligible is to be reasserted in order to have a genuine relationship with the world of nature as well as with other human beings.^{233[33]}

The last but by no means the least important aspect of modern science might be described as an ineluctable outcome of the preceding factors that we have just outlined. This pertains to the very context in which modern science is pursued and supported by governments, institutions and corporations. At this point, one of the most apparent leitmotifs of modern science is its connection with power and domination that has received a global prevalence with the consolidation of world capitalist economy. Science as a way of gaining power and control over nature and other human beings is certainly a very strong impulse that lies at the heart of modern scientific enterprise. An important outcome of this new spirit has been the wedding between science and technology to the extent that one can hardly speak of 'pure science' anymore that will not be succumbed to the demands and conditions of consumerist economy. Putting aside the extremely limited number of scientists who still see their vocation as a pursuit of truth and knowledge, nearly the entire body of modern science is driven by a will to power which manifests itself in the never-ending technological novelties financed by government funds and international corporations. Many critiques of modern science have warned against the dangers of rapid technological change that creates a state of unbounded dependency on

²³³ The idea of the unity of the intellect and the intelligible is one of the fundamental teachings of traditional philosophy and plays an important role in Nasr's writings on knowledge. For Nasr's treatment of the subject, see the first chapter of *Knowledge and the Sacred*, pp. 1-64. In the *De Anima* (430a), Aristotle refers to this idea by saying that 'in the case of objects without matter, that which thinks and that which is being thought are the same, for theoretical knowledge and its knowable object are the same.' See *De Anima*, translated by H. G. Apostle as *Aristotle on the Soul* (The Peripatetic Press, 1981), p. 51. The main inspiration of Islamic philosopher, however, comes from the *Enneads* V where Plotinus gives a detailed explanation of the subject. Although Ibn Sina rejects, curiously enough, the unity of the intellect and the intelligible, later mystics and philosophers such as Suhrawardi, Ibn al-Arabi and Sadr al-Din Shirazi have continued to elaborate on the subject. Sadr al-Din Shirazi has even written a treatise called *Ittihad al-'aql wa'l-ma'qul* ([On] the Unity of the Intellect and the Intelligible) published in *Majmua-yi rasail-i falsafi-i Sadr al-Muta'allihin*, ed. by Hamid Naji Isfahani (Tehran: Intisharat-i Hikmet, 1996), pp. 64-103. Some scholars have claimed that the idea of the unity of the intellect and the intelligible can be traced back to various passages in *Phaedon*, *Timaeus* and the *Republic* where a 'solidarite d'existence' is established between the Ideas and the soul. For a well-informed essay on this subject see, J. Pepin, 'Elements pour une histoire de la relation entre l'intelligence et l'intelligible chez Plato et dans le neoplatonisme', *Revue Philosophique* 81, (1956), pp. 39-64. For a recent statement of the problem in a comparative way, see M. Hairi Yazdi, *The Principles of Epistemology in Islamic Philosophy: Knowledge by Presence*, (Albany, SUNY Press, 1992).

the one hand, and an irremediable sense of dislocation on the other.^{234[34]} Nasr sees the roots of this predicament in the very assumptions of modern science and its stance towards nature that has led to its desecration and decimation. Accordingly, any plausible solution for the persisting problems caused by modern science and technology can be achieved not by better engineering or further progress but by reconsidering the entire perspective of the modern world-view over nature, human life and its meaning.^{235[35]}

By way of conclusion, I would like to state two points on the implications of Nasr's view of science. Nasr's critique of modern secular science is based, as we have seen, on his conviction that the philosophical foundations of modern physical sciences are marred in a serious way and that their misdeeds can be countered only by rediscovering the sacred view of the cosmos. Obviously, this inference has a number of interesting consequences for the current relationship between religion and science, into which we cannot go within the limits of this study. One important result, however, is that modern science, because of the secular framework it adopts, cannot be regarded as a continuation of traditional or pre-modern sciences as it is assumed by many historians of science.²³⁶ As I have pointed out earlier, the main difference between traditional and modern sciences is one of perspective and perception, not technical advancement. This being the case, the attempts to dovetail the findings of modern science with the spiritual teachings of traditional religions, as it has become a widespread fashion in the recent decades, are destined to fail unless we set out to redefine the metaphysical underpinnings of science as a way of coming to terms with the world of nature. Without undertaking this colossal task, our efforts will do no good than elevating science to a semi-religious truth or turning religion into a scientific trope.^{237[37]} Keeping this in mind, Nasr's critical work,

²³⁴ There is a considerable literature on the consequences of living in a technology-bound society. Among others, one may refer to Philip Sherrard, *The Rape of Man and Nature: An Enquiry into the Origins and Consequences of Modern Science*, (Golgoonza Press, 1987); Jacques Ellul, *The Technological Society*, tr. by John Wilkinson, (New York: Vintage Books, 1964); William Barrett, *The Illusion of Technique*.

²³⁵ Nasr has devoted two separate books on the analysis of this crucial subject. See his *Man and Nature: The Spiritual Crisis in Modern Man and Religion and the Order of Nature*, especially the last chapter. See also *A Young Muslim's Guide to the Modern World*, pp. 190-192, for the difference between science and technology.

²³⁶ *Religion and the Order of Nature*, p. 127ff; and *A Young Muslim's Guide to the Modern World*, pp. 181-2.

²³⁷ Darwinism is probably the best example to illustrate this point. Although Nasr gives credit to the scientific evidence against the theory of evolution, his main critique is metaphysical and philosophical throughout. See his *Knowledge and the Sacred*, chapter 7. For a similar line of argument, see Titus

as it may seem too radical and uncompromising to some, is likely to be a secure starting point for a more comprehensive and plausible discourse on the relation between religion and science.

With his unyielding stance, Nasr also opens up a new avenue for facing up to the challenge of modern science without sacrificing the traditional ideas and values, and for rejecting the totalizing claims of modern secular worldview which continues ever increasingly to dominate every facet of human life. Considering the current positions taken on science, which has been either total submission in the case of modernism or an inchoate rejection in the case of postmodernism and its associates, Nasr's critical approach offers a veritable alternative to both extremes, inviting us to a serious deliberation over the very terms of the question of science. In this sense, the reassertion of the religious view of the universe and its meaning for natural sciences is indubitably of prime importance not only for the followers of any particular religion but for the whole of society. Yet, it is to be hoped that the necessary steps in this direction are taken carefully before we lose the very ground on which we stand.

Burckhardt, *The Mirror of the Intellect: Essays on Traditional Science and Sacred Art*, tr. by William Stoddart (Cambridge: Quinta Essentia, 1987), pp. 32-45; and Osman Bakar (ed.), *Critiques of the Theory of Evolution* (Kuala Lumpur: The Islamic Academy of Science, 1987).