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The Nature and Extent of Criticism of Evolutionary Theory

Osman Bakar

In this essay, we will look into the existing body of criticisms which have been brought against the modern theory of evolution; we will investigate the nature and extent of these criticisms and conclude with an evaluation of their meanings and significance and the possible impact they will have on the future development of the theory.

Before we proceed to identify the above body of criticisms, we need to clarify the meaning of the precise idea or concept that is being criticized since the term *evolution* has been used to convey different meanings and connotations. Herbert Spencer, for example, who is considered the first great evolutionist and who gave the word evolution its modern connotation in English, used the word in two different senses in his essay *The Development Hypothesis*[1] which appeared in the *Leader* between 1851 and 1854, that is several years before the publication of Darwin's *The Origin of Species*. In this essay as well as in his later work *The Principles of Biology*, Spencer describes both the development of an individual adult organism from a mere egg and phylogenetic transformation of species as processes of evolution.[2] This usage of a single term, namely evolution, to describe two altogether fundamentally different processes has generally been avoided by today's scientists. But the possibility of confusion

1 This essay was reprinted in *Essays: Scientific, Political and Speculative* (London, 1868). In it Spencer asks why people find it so very difficult to suppose "that by any series of changes a protozoon should ever become a mammal" while an equally wonderful process of evolution, the development of an adult organism from a mere egg, stares them in the face. See Peter Medawar, *Pluto's Republic*, Oxford University Press (1982), p. 211.

2 See H. Spencer, *The Principles of Biology*, revised ed., London (1898), first volume.

remains because the term, though now restricted to one process alone, is still used differently by different sections of the scientific community. As pointed out by Sir Peter Medawar, the distinguished British biologist who was awarded the Nobel Prize for Medicine in 1960, biologists who use English as a scientific language never use the word "evolution" to describe the processes of growth and development because to do so would be confusing and misleading.[3] Among French scientists generally, however, it is the word *evolution* which is used to describe biological transformations within a particular species in adapting itself to a changed set of natural conditions while the supposed change of one species into another through natural agencies and processes is denoted by the term *transformism.*[4] It is in the sense of this transformism that we are using the term evolution here. And we are adopting this term instead of the word transformism precisely because, as pointed out by Professor S. H. Nasr, it contains a more general philosophical meaning outside the domain of biology not to be found in the more restricted term transformism.[5] Indeed, it will throw much light on the historical origin of the idea it conveys and its conceptual relationship with certain philosophical ideas that were dominant at the time of its formulation and this is of great relevance to our present discussion. In this essay, it is with the criticisms of the idea of evolution in the sense of transformism and its various implications that we concern ourselves.

More than a century after Darwin's publication of *The Origin of Species,*[6] opposition to the theory of evolution still continues and in

3 Medawar, Peter, *op. cit.*, pp. 215-216.

4 On the insistence of some scientists on a careful distinction between evolution and transformism, see M. Vernet, *Vernet contre Teilhard de Chardin*, Paris (1965).

5 See S. H. Nasr, *Knowledge and the Sacred*, Crossroad, New York (1981), p. 249.

6 *The Origin of Species* appeared on 24th November 1859 in an edition of 1,250 copies, all of which were sold on the first day. See Paul Edwards, ed., *The Encyclopedia of Philosophy*, Macmillan & Free Press, New York (1967), vol. 2, p. 249.

This extraordinary enthusiasm shown toward *The Origin* can only mean, and this is generally recognized now, that the idea of organic evolution was already widely discussed before *The Origin*. For a detailed inquiry into this pre-*Origin* discussion of organic evolution, see for example Arthur O. Lovejoy, "The Argument for Organic Evolution before *The Origin of Species*, 1830-1858," in B. Glass, O. Temkin, and W. L. Straus, eds., *Forerunners of Darwin*, 1745-1859, Johns Hopkins Press, Baltimore, 1968 edn., Chapter 13, pp. 356-414.

fact has been more widespread in the past several years. What is the nature of this opposition? There are many evolutionists who would like us to believe that whatever opposition there has been has come solely from the non-scientific quarters especially those who have their religious views and interests at stake. That such belief actually prevailed in the minds of most people for quite a long period of time, and is still widely held, is due mainly to the evolutionists' vast and well-established propaganda machine which ensures that no potential scientific opposition be given the opportunity to gain a foothold in the scientific establishment.

Now that the dissent and opposition within the scientific rank is too widespread to be ignored or contained, certain evolutionists are quick to justify the present state of controversy surrounding evolutionary theory as a natural consequence of the most extraordinary attention that biologists have given to the theory in nearly fifty years and also as reflecting a more critical acceptance of the theory on their part in contrast to the complacency of their predecessors.[7] Whatever justifications evolutionists may wish to advance, the fact is that today there are many scientists who oppose the theory of evolution on purely scientific grounds and in turn argue for the need of a positive alternative, namely a non-mechanistic explanation of the origin of life.[8]

More than fifteen years ago, the fact that there was a widespread dissatisfaction with evolutionary theory was already admitted. Sir Peter Medawar whom we have mentioned earlier, in his opening remarks as chairman of a symposium entitled *"Mathematical*

7 One such recent work which attempts to explain the meaning and significance of the present state of controversy in evolutionary biology is Niles Eldredge, *The Monkey Business: A Scientist Looks at Creationism*, Washington Square Press, New York, 1982. For example, he says, "Today, though chaos is too strong a word, there is definitely dissent in the ranks. Few biologists agree as completely and complacently as they did that short time ago. . . . The unusual thing about evolutionary biology is not its current state of flux. If anything was unusual, it was perhaps the period of quiescence and agreement from which evolutionary biology is only now beginning to emerge." p. 52.

8 One of the most recent additions to the list of scientific pleas for a non-physical, non-mechanistic explanation of the origin of living organisms is a work by Richard L. Thompson entitled, *Mechanistic and Nonmechanistic Science: An Investigation Into the Nature of Consciousness and Form*, Bala Books, New York (1981). Thompson is a mathematician and research scientist in mathematical biology.

Challenges to the Neo-Darwinian Interpretation of Evolution" held April 25 and 26, 1966 at the Wistar Institute of Anatomy and Biology, Philadelphia, said: "There is a pretty widespread sense of dissatisfaction about what has come to be thought of as the accepted evolutionary theory in the English-speaking world, the so-called Neo-Darwinian theory."[9] He identified three main quarters from which this dissatisfaction came: scientific, philosophical and religious.[10] To these we would add another important category of criticisms, namely the metaphysical and cosmological, which must be distinguished from the philosophical[11] and without which no study on contemporary opposition to evolutionary theory is complete. We consider these latter criticisms to be of greatest importance because they were missing in the original debate on evolution due to the eclipse of the metaphysical tradition in the Western intellectual firmament in the nineteenth century. In the absence of authentic metaphysical knowledge particularly pertaining to nature, and with nineteenth-century European theology unable to provide satisfactory answers to the problem of causality, the theory of evolution appeared to Western man then as the most plausible and rational explanation of the origin and diversity of life.[12] We now

9 P. S. Moorhead and M. M. Kaplan, eds., *Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution*, p. XI. Quoted by A. E. Wilder-Smith, *The Creation of Life*, Wheaton, Illinois (1970), p.37.

10 Wilder-Smith, A. E., *op. cit.*, pp 37-38.

11 "Metaphysics is a science as strict and exact as mathematics and with the same clarity and certitude, but one which can only be attained through intellectual intuition and not simply through ratiocination. It thus differs from philosophy as it is usually understood. Rather, it is a *theoria* of reality whose realization means sanctity and spiritual perfection, and therefore can only be achieved within the cadre of a revealed tradition." S. H. Nasr, *Man and Nature*, Unwin Paperbacks, London (1976), p. 81.

12 "The understanding of metaphysics could at least make clear the often forgotten fact that the plausibility of the theory of evolution is based on several non-scientific factors belonging to the general philosophical climate of eighteenth-century and nineteenth-century Europe such as belief in progress, Deism which cut off the hands of the Creator from His creation and the reduction of reality to the two levels of mind and matter. Only with such beliefs could the theory of evolution appear as 'rational' and the most easy to accept for a world which had completely lost sight of the multiple levels of being and had reduced nature to a purely corporeal world totally cut off from any other order of existence." S. H. Nasr, op. cit., p. 125.

take a closer look at each of these types of criticisms and investigate to what extent the ideas embodied in them are being discussed within the academic community.

We begin with a survey of the historical origin and development of metaphysical criticisms of evolution. In his Gifford lectures presented in 1981, the first ever by a Muslim scholar, Professor Nasr conveys one important fact about the nineteenth century: it marks the peak of the eclipse of metaphysical tradition in the West. What rays of metaphysical light there were, associated with such names as Thomas Taylor, Goethe, Blake and Emerson, for one reason or other never succeeded in penetrating through the highly secularized philosophical and scientific layer enveloping the mind of Western man.[13] In reality, therefore, what characterized the nineteenth-century debate on evolution was the absence of its metaphysical dimension. But many exponents and defenders of evolution think otherwise. In their view, one of the achievements of Darwinian evolution was to break the hold on biological thinking of such metaphysical ideas as the immutability of species, divine archetype, creation and design or purpose in Nature, ideas which permeated pre-Darwinian biology.[14] It is true that all these ideas are contained in the teachings of traditional metaphysics. But these ideas also belong to popular theology. Between the metaphysical and the theological understandings of these ideas, there are significant differences whether it is in Islam or in Christianity. When these ideas were attacked by various quarters in the nineteenth-century West, their true metaphysical meanings were no longer in currency. The attack was therefore mainly directed toward the popular theological formulations of those ideas.

Take, for example, the idea of creation. What evolutionists have severely attacked is the theological conception of *creatio ex nihilo* (creation out of nothing). Metaphysicians understand the idea of creation differently. They refer to it as creative emanation. (A brief discussion of this important metaphysical idea is given below). Here there is no question of having to make a choice between creation *ex nihilo* and creative emanation. Both are true but at different levels.

13 See Nasr, S. H., *Knowledge and the Sacred*, pp. 97-99.
14 Paul Edwards, ed., *The Encyclopedia of Philosophy*, p. 303.

As pointed out by Frithjof Schuon (see below), creative emanation is not opposed to creation *ex nihilo*. In fact, the metaphysical conception of creative emanation explains the real meaning of *ex nihilo*. Both ideas are meant to fulfill the different needs of causality among different types of "mentality" found within a religious community. Within the religious world-view, the idea of creative emanation proved to be more attractive or satisfying to the scientifically and philosophically minded than the idea of creation *ex nihilo* in its theological sense. This is certainly true in the case of Islamic civilization. In that civilization many philosopher-scientists, apart from the Sufis, adopted emanation as the philosophical basis for the explanation of the origin of the universe and the emergence of different qualitative forms of life.

What about the idea of evolution itself? This question is answered by Martin Lings:

> The gradual ascent of no return that is envisaged by evolutionism is an idea that has been surreptitiously borrowed from religion and naïvely transferred from the supra-temporal to the temporal. The evolutionist has no right whatsoever to such an idea, and in entertaining it he is turning his back on his own scientific principles.[15]

Very few people today realize that the idea of evolution originally belonged to metaphysics. But in the nineteenth-century West, as we have previously stated, metaphysical ideas, including the idea of evolution, had all been emptied of their true metaphysical content through a long process of secularization. The evolutionary chain of living organisms in post-Darwinian biology is none other than the secularized and temporalized version of the traditional metaphysical doctrine of gradation or the "great chain of being" of the Western tradition. The whole set of "metaphysical" ideas, which are collectively referred to as creationism by some historians of science,[16] were understood then and have been understood ever since solely at the popular, theological level. Thus the true nature of

15 Martin Lings, "Signs of the Times" in *The Sword of Gnosis*, ed., Needleman, J. Baltimore (1974), p. 114.

16 See Gillespie, Neal C., *Charles Darwin and the Problem of Creation*, University of Chicago Press, Chicago (1979), Chapter 1.

the debate between evolution and creationism in the nineteenth century was anything but metaphysical.[17]

Metaphysical Criticisms of Evolution

What can properly be called metaphysical criticisms of evolution first appeared in the early part of this century in the writings of a small group of metaphysicians in the course of their presentation of the traditional doctrines of the Orient.[18] The first as well as the central figure most responsible for the presentation of these doctrines in their fullness was René Guénon (1886-1951), a Frenchman and a mathematician by training. His first book was published in 1921 and entitled *Introduction générale à l'étude des doctrines hindoues (General Introduction to the Study of the Hindu Doctrines*). This was the first full exposition of the main aspects of traditional doctrines. A complete guide to René Guénon's intellectual career and works during the next thirty years was provided by another eminent metaphysician, Ananda K. Coomaraswamy (1877-1947) in an essay entitled *Eastern Wisdom and Western Knowledge*.[19]

Coomaraswamy, born of a Singalese father and an English mother, was a distinguished geologist before his conversion to traditional metaphysics. At twenty-two he contributed a paper on "Ceylon Rocks and Graphite" to the *Quarterly Journal of the Geological Society* and at twenty-five he was appointed director of the Mineralogical Survey of Ceylon. A few years later he was awarded the degree of Doctor of Science by the University of London for his work on the geology of Ceylon.[20] Like René Guénon, he also produced numerous articles and books on metaphysics and cosmology

17 *Editor's note:* "In reality, the evolutionist hypothesis is unnecessary because the creationist concept is so as well; for the creature appears on earth, not by falling from heaven, but by progressively passing—starting from the archetype—from the subtle to the material world, materialization being brought about within a kind of visible aura quite comparable to the 'spheres of light' which, according to many accounts, introduce and terminate celestial apparitions." Frithjof Schuon, *From the Divine to the Human* (World Wisdom, Bloomington, 1982), p. 88.

18 Nasr, S. H., *op. cit.*, p. 100.

19 Coomaraswamy, Ananda K., *The Bugbear of Literacy*, Perennial Books, Bedfront, Middlesex, Chapter IV, pp. 68-79, (1979 edn.)

20 *Ibid*, p. 8.

which in many respects complemented the works of the former.[21] Through his writings, Coomaraswamy played a great role in reviving the traditional point of view. Professor Nasr, in his study of the history of the dissemination of traditional teachings in the West during this century, considers the task of the completion of the revival of traditional metaphysics to have been accomplished through the writings of Frithjof Schuon, an outstanding poet, painter and metaphysician, in the sense that in the totality of the writings of these three metaphysicians traditional metaphysics is now being presented in all its depth and amplitude.[22]

What we are mainly concerned with here now is this question: to what extent can we identify the body of metaphysical criticisms of evolution with this general body of traditional teachings itself? We have identified earlier the origin of these metaphysical criticisms, historically speaking, with the first true revival of traditional teachings in the West associated with the above three names. Each of them did, in fact, criticize the theory of evolution on various occasions in the process of expounding their metaphysical doctrines. René Guénon, for example, criticized evolution in his exposition of the traditional doctrine of the hierarchy of existence or the multiple states of being[23] and the theory of cosmic cycles[24] among others; Coomaraswamy discussed in several of his essays the distinction between the traditional doctrine of gradation and the modern theory of evolution;[25] as for Frithjof Schuon, his reference to and criticisms of evolution were made during discussions of such doctrines as creative or cosmogonic emanation, which is an aspect of the Principle-Manifestation relationship.[26] In all these criticisms, the fundamental ideas associated with the creationism of the nineteenth century namely the immutability of species, divine archetypes, creation and design in Nature, which were described by

21 Nasr, S. H., *op. cit.*, p. 105.

22 *Ibid*, p. 107.

23 See his "Oriental Metaphysics" in Needleman, J., (ed), *op. cit.*, pp. 40-56.

24 René Guénon, *op. cit.*, p. 50.

25 Coomaraswamy, A. K., *op. cit.*, Chapter VI, pp. 118-124. See also his *Time and Eternity*, pp. 19-20.

26 See his *Form and Substance in the Religions*, (World Wisdom, Bloomington, Indiana, 2002), pp. 63-65: and also his *Stations of Wisdom*, (World Wisdom Books, Bloomington, Indiana, 1995) pp. 93-95.

evolutionists as negative statements about the origin and diversity of life devoid of any scientific meaning, were elaborated in detail from the metaphysical points of view. These metaphysical explanations provide the true basis for any alternative biological theory to evolution.

Having discussed and identified the origin of metaphysical criticisms we now look at their development. We need to explain here what we mean by the development of metaphysical criticisms of evolution. In a sense we can speak of traditional metaphysics as a whole as an implied criticism of evolution and all its generalizations and implications inasmuch as metaphysics is a *theoria* or vision of Reality and evolutionism is its modern substitute. That is to say, all metaphysical criticisms that there can be are contained, potentially speaking, in this general body of traditional metaphysics which has now been made available in its fullness in the language of contemporary scholarship. But there remains the work of scholarship to identify these "potential" criticisms with concrete aspects and situations pertaining to evolution and its implied world-view. It is in this area that we can speak of the development of metaphysical criticisms.

There is one more sense in which we can speak of the development of such criticisms. Once a particular individual has formulated and developed a particular criticism based on the relevant metaphysical doctrines, how is this criticism received and what is its circle of influence within the scholarly world? Development in the former sense is "vertical" and "qualitative." It refers to ideas as such irrespective of the numerical strength of its believers. It is possible that the ideas in question are subscribed to by one individual alone and then opposed or rejected by the whole academic community. However, as it stands today, there are a number of contemporary scholars belonging to the traditional world-view who have developed further the metaphysical criticisms of evolution contained in the pioneering works of René Guénon, Ananda Coomaraswamy and Frithjof Schuon. Among them we can mention Titus Burckhardt, Martin Lings and Seyyed Hossein Nasr.[27] As for the development of metaphysical criticisms in the second sense, it is

27 Burckhardt's detailed criticisms of evolution can be found in his "Cosmology and Modern Science" [*Editor's note:* Included in the current anthology]; For Martin

"horizontal" and quantitative. It refers to the extent of diffusion and dissemination of criticisms formulated by the above traditional scholars within the academic community. This, no doubt, depends much on the extent of influence of traditional metaphysics itself for these metaphysical criticisms can hardly be appreciated without a prior appreciation of the latter. This is best illustrated by the fact that the scholars who have dealt with metaphysical criticisms of evolutionary theory are those who have been attracted to or influenced by the traditional teachings, wholly or partially.[28]

As for the influence of traditional metaphysics in contemporary scholarship, Professor Nasr has presented us with the following assessment:

> The traditional point of view expounded with such rigor, depth and grandeur by René Guénon, Ananda Coomaraswamy, and Frithjof Schuon has been singularly neglected in academic circles and limited in diffusion as far as its "horizontal" and quantitative dissemination is concerned. But its appeal in depth and quality has been immeasurable. Being the total truth, it has penetrated into the hearts, minds, and souls of certain individuals in such a way as to transform their total existence. Moreover, ideas emanating from this quarter have had an appeal to an even larger circle than that of those who have adopted totally and completely the traditional point of view, and many scholars and thinkers of note have espoused certain basic traditional theses.[29]

We end our discussion of metaphysical criticisms of evolution with a look at their content itself. It is not possible to present here all the metaphysical arguments which have been brought against the theory of evolution. For a more complete account of these arguments we refer to the relevant works of various traditional authors that we have cited. Here we restrict ourselves to the criticisms of what we consider to be the fundamental ideas of evolutionary

Lings's criticisms, see his "Signs of the Times" in the Needleman, J., *op. cit*, pp. 109 -121 and *Ancient Beliefs and Modern Superstitions*, Unwin Paperbacks, London (1980); as for Nasr's criticisms see in particular his *Man and Nature*, pp. 124-129, *Islam and the Plight of Modern Man*, Longman, London (1975), pp. 138-140 and *Knowledge and the Sacred*, pp. 234-245.

28 One can mention among them Huston Smith with his *Forgotten Truth: The Primordial Tradition*, Harper and Row, New York (1976), Chapter 6; E. F. Schumacher with his *Guide for the Perplexed* and Richard L. Thompson with his *Mechanistic and Nonmechanistic Science*.

29 Nasr. S. H., *Knowledge and the Sacred*, p. 109.

theory. In any theory, there is none more fundamental than the very basis of its own existence. And metaphysics criticizes evolutionary theory at its very root. This means that no amount of facts accumulated by biology can in any way affect the truth of this metaphysical criticism. Frithjof Schuon expressed this criticism as follows:

> . . . what invalidates modern interpretations of the world and of man at their very root and robs them of every possibility of being valid, is their monotonous and besetting ignorance of the supra-sensible degrees of Reality, or of the "five Divine Presences.". . . For example, evolutionism—that most typical of all the products of the modern spirit—is no more than a sort of substitute: it is a compensation "on a plane surface" for the missing dimensions. Because one no longer admits, or wishes to admit, the supra-sensible dimensions proceeding from the outward to the inward through the "igneous" and "luminous" states to the Divine Center, one seeks the solution to the cosmogonic problem on the sensory plane and one replaces true causes with imaginary ones which in appearance at least, conform with the possibilities of the corporeal world. In the place of the hierarchy of invisible worlds, and in the place of creative emanation—which it may be said, is not opposed to the theological idea of the creatio ex nihilo, but in fact explains its meaning—one puts evolution and the transformation of species, and with them inevitably the idea of human progress, the only possible answer to satisfy the materialists' need of causality.[30]

From the point of view of metaphysics then the true cause or origin of life does not reside in the material or physical world but in the transcendental. Objects in the world "emerge" from what is called in Islamic metaphysics the "treasury of the Unseen" (*khazânay-i ghayb*). Nothing whatsoever can appear on the plane of physical reality without having its transcendent cause and the root of its being *in divinis*. How does life "emerge" from this "treasury of the Unseen" into the physical world? This process of "emergence" can best be explained by the doctrine of the "five Divine Presences" to which Frithjof Schuon referred. The various degrees of reality contained in the Divine Principle are in ascending order, the following: *firstly*, the material state (gross, corporeal and sensorial); *secondly*, the subtle (or animistic) state; *thirdly*, the angelic world

30 Frithjof Schuon, *Form and Substance in the Religions*, Bloomington, Indiana (2002), pp. 63-65.

(paradisiac, or formless or supra formal); *fourthly*, Being (the "qualified," "self-determined" and ontological Principle); and *fifthly*, Non-Being or Beyond-Being (the "non-qualified" and "non-determined" Principle which represents the "Pure Absolute").[31]

Now the formal world—the corporeal and subtle states—possesses the property of "congealing" spiritual substances, of individualizing them and at the same time separating them one from another. Let us apply this property of the formal world to explain the appearance of species in the physical world. A species is an "idea" in the Divine Mind with all its possibilities. It is not an individual reality but an archetype, and as such it lies beyond limitations and beyond change. It is first manifested as individuals belonging to it in the subtle state where each individual reality is constituted by the conjunction of a "form" and a subtle "proto-matter," this "form" referring to the association of qualities of the species which is therefore the trace of its immutable essence.[32]

This means that different types of animals, for example, preexisted at the level immediately above the corporeal world as non-spatial forms but clothed with a certain "matter" which is of the subtle world.[33] These forms "descended" into the material world, wherever the latter was ready to receive them, and this "descent" had the nature of a sudden coagulation and hence also the nature of a limitation or fragmentation of the original subtle form. Thus species appear on the plane of physical reality by successive "manifestations" or "materializations" starting from the subtle state. This then is the "vertical" genesis of species of traditional metaphysics as opposed to the "horizontal" genesis of species from a single cell of modern biology.

In the light of the above metaphysical conception of the origin of species, it is safe to say that those "missing links" which are so much sought after by evolutionists in the hope of finding the ancestors of a species will never be found. For the process of "materialization" going from subtle to corporeal had to be reflected within the material or corporeal state itself so that the first generations of

31 *Ibid*, p. 142.
32 Titus Burckhardt, *"Traditional Cosmology and Modern Science," op. cit.*
33 *Ibid*, p. 148.

a new species did not leave a mark on the physical plane of reality.[34] It is also clear why a species could not evolve and become transformed into another species. Each species is an independent reality qualitatively different from another; this reality can in no way be affected by its history on the corporeal domain. However, there are variations within a particular species and these represent diverse "projections" of a single essential form from which they will never become detached; they are the actualization of possibilities which had preexisted in the archetypal world and this is the only sense in which we can speak of the growth and development of species.[35] In this connection, Douglas Dewar, an American biologist who was an evolutionist in his youth but later became a critic of the evolutionary theory, remarked that the whole thesis of the evolution of species rests on a confusion between species and simple variation.[36]

Metaphysics has also something to say about those biological "facts" such as the existence of "imitative" animal forms and the successive appearance of animal forms according to an ascending hierarchy which have been cited by evolutionists as clear proofs of their theory as well as the implausibility of the immutability of species. For a discussion of the metaphysical significance of these biological facts we refer to Burckhardt's essay in this anthology. We conclude our discussion of metaphysical criticisms of evolutionary theory with the following assertion: Traditional metaphysics is fully qualified to provide a meaningful interpretation to both the accomplished facts of evolutionary biology and its outstanding difficulties.

Scientific Criticisms

We now turn to a discussion of scientific criticisms of evolution, the only kind of criticisms which matter to most people today, particularly the scientific community.[37] There is as yet no complete account of the history of scientific opposition to the theory of evo-

34 *Ibid*, pp. 148-149.

35 Nasr. S. H., *op. cit.*, p. 235.

36 Douglas Dewar, *The Transformist Illusion*, Murfreesboro, Tennessee., Dehoff Publications, (1957). Quoted by Burckhardt, *op. cit.*

37 ". . . the only objections to evolutionary theory about which the scientists care are the truly scientific ones. These real scientific objections were the actual basis for

lution. There have been, however, several studies devoted to nineteenth-century criticisms of evolution by the scientific community both before and after the publication of Darwin's *The Origin of Species*.[38] Studies on pre-*Origin* criticisms were carried out more with the aim of identifying the forerunners of Darwin than of understanding the nature and dynamics of the criticisms as such. As for twentieth century scientific opposition, very little attention has been paid to it by historians and philosophers of science. There are no available sources on both the quantitative and qualitative extent of scientific criticisms of evolution in this century except for the few, but highly useful, writings of those traditional scholars we have previously mentioned.[39] We may also mention such works as Douglas Dewar's *The Transformist Illusion*, E. V. Shute's *Flaws in the Theory of Evolution* and W. R. Thompson's essay which appeared as an introduction to Everyman's Library's 1958 edition of Darwin's *The Origin of Species* replacing that of the famous English evolutionist, Sir Arthur Keith.[40]

From the above few works, particularly the last three, we nevertheless have highly valuable information about the status of the theory of evolution within the scientific community, especially during the first half of this century. Among the important conclusions which can be drawn from them are: *first*, throughout its history, the theory of evolution has been continuously criticized or opposed by a section of the scientific community; *secondly*, evolutionists resorted to various unscientific practices in their overzealous attempts to ensure the dominance and supremacy of

the convening of the symposium. The burden of them all was that there are missing factors in present day evolutionary theory." Peter Medawar's concluding remarks as chairman of a symposium already mentioned. Quoted by A. E. Wilder-Smith in his *The Creation of Life*, p. 38.

38 See for example Gillespie, Neal C., *op. cit.*; David L. Hull, *Darwin and His Critics*: *The Reception of Darwin's Theory of Evolution by the Scientific Community*, Harvard University Press, Cambridge (1973); Sir A. Keith, *Darwinism and its Critics*, (1935) and the already cited *Forerunners of Darwin*.

39 *Editor's note:* Since the first edition of this article there have been a number of interesting works in this domain. For an account of these resources Chapter 7 of the current anthology by James S. Cutsinger is a very good source.

40 W. R. Thompson, "The Origin of Species: A Scientist's Criticism" in *Critique of Evolutionary Theory*, ed. Bakar, O. The Islamic Academy of Science (ASASI) and Nurin Enterprise, Kuala Lampur, Malaysia (1987), pp. 15-39.

evolutionary theory not only within the scientific establishment but also among the public at large; *thirdly*, at the beginning of the second half of the century we can detect a significant increase in the volume of scientific criticisms against various aspects of evolutionary theory of which the above three works are the best examples, and this trend has continued ever since; and *fourthly*, many scientists have expressed doubt about the general usefulness of evolutionary theory to the whole discipline of biological sciences. We will discuss these four points following our brief treatment of the issue of scientific opposition to evolution in the nineteenth century.

What we mean by scientific criticism or opposition here is that the nature of the arguments is scientific as this term is generally understood today, rather than that the source of the arguments is scientific. In the nineteenth-century debate on evolution, this distinction has to be made because there were many scientists who opposed the new theory on both scientific and religious grounds. These include, at least until the publication of the *Origin*, such well-known scientists as the American geologist Edward Hitchcock, British geologist Adam Sedgwick, Richard Owen,[41] England's foremost comparative anatomist in the 1850s, Louis Agassiz and James Dwight Dana, the two most influential of American naturalists, geologist Joseph LeConte who was Agassiz's student, the English entomologist T. Vernon Wollaston, Scottish naturalist the Duke of Argyll, Canadian scientist John William Dawson, mathematician-geologist William Hopkins and many others.[42] All of them rejected evolution then as contrary to known geological and biological facts.

Not long after *The Origin*, many scientists were converted to the evolutionary doctrine including a former critic Joseph LeConte mentioned above. Others like Richard Owen, the Duke of Argyll and St. George Jackson Mivart who published his *Genesis of Species* in 1871 adopted an intellectual compromise between their former position and Darwinian evolution through their idea of providential evolution. In reality, however, the two kinds of evolution do not differ in intellectual substance or doctrinal content for they refer to the same organic process.[43] Where they differ is in their views of the

41 On their critiques see Gillespie, N. C., *op. cit.*, p. 22.
42 *Ibid*, p. 26.
43 *Ibid*, Chapter 5, entitled "Providential Evolution and the Problem of Design."

place and role of God in that process. For the Darwinian evolutionists, organic evolution is purely a product of physical and natural causes while for the providential evolutionists it is God's mode of creation. Though the providential evolutionists vehemently opposed Darwin's natural selection as an explanatory mechanism of organic evolution insofar as it leaves no room for divine purpose and control, their acceptance of organic evolution albeit in religious shape "with little touches of special creation thrown in here and there"[44] took them closer to positivism and out of the realm of special creation. As for the rest of the scientists like Louis Agassiz who believed in special creation and continued to oppose the idea of evolution, they became a rarer intellectual species by the end of the century though by no means extinct.

In the light of oft-repeated charges that the theory of evolution has no scientific basis whatsoever, we should investigate what then caused the conversion of a large number of scientists to the evolutionary doctrine after the publication of *The Origin*. Certainly it was not due to the convincing amount of scientific evidence marshaled by *The Origin*. On the contrary, Darwin himself referred more than once to the lack of evidence in support of many of his claims in *The Origin*. The success of the theory of evolution was due mainly to factors other than scientific. In fact we can assert categorically that there was something very unscientific about the whole way in which the theory rose to its dominant position in science, and as we shall see later, also about the way in which it has attempted to maintain this dominance. It became dominant not through its own strength by which it withstood tests, analyses and criticisms but through the weakness of its rivals, those various forms of creationism which were in conflict with each other and which no longer satisfied the positivist's need for causality. Since the theory is a fruit of the application of the philosophical idea of progress to the domain of biology, the ascendancy of the latter idea in the nineteenth century contributed greatly to the ascendancy of the theory. Thus it has been said:

> . . . the theories of evolution and progress may be likened to the two cards that are placed leaning one against the other at the foundation of a card house. If they did not support each other, both

44 *Ibid*, p. 103.

> would fall flat, and the whole edifice, that is, the outlook that dominates the modern world, would collapse. The idea of evolution would have been accepted neither by scientists nor by "laymen" if the nineteenth-century European had not been convinced of progress, while in this century evolutionism has served as a guarantee of progress in the face of all appearances to the contrary.[45]

There was no lack of scientific arguments on the part of nineteenth-century critics of evolution. But somehow the evolutionists did not address themselves fully to the fundamental issues and objections raised in these scientific arguments but instead highlighted the inadequacy and negativity of creationism as explanatory mechanisms of the diversity of living organisms.

Let us return to the "four points" previously mentioned. First, we said that the theory of evolution has been continuously opposed by a section of the scientific community. From the 1890s to the 1930s there was a widespread rejection of natural selection among the scientific community.[46] Though the rejection of natural selection does not necessarily imply the rejection of evolution itself, it does show that the true explanation of biological diversity has not yet been found and without any plausible mechanism of how evolution has occurred the status of evolution is nothing more than that of a hypothesis at best. In their continuing efforts to defend the idea of evolution, numerous explanations were offered by various scientists as to how it has occurred but in the words of Dewar they were all purely conjectural and mutually contradictory.[47] There is also the admission by a Sorbonne Professor of Paleontology, Jean Piveteau, that the science of facts as regards evolution cannot accept any of the different theories which seek to explain evolution and in fact it finds itself in opposition with each one of these theories.[48]

The general disagreement among scientists on this very question continue until this very day. Only very recently, this internal controversy within the evolutionary ranks became a near battle when some 150 prominent evolutionists gathered at Chicago's Field Museum of Natural History to thrash out various conflicting hypotheses about the nature of evolution. After four days of heated

45 Martin Lings, *"Signs of the Times,"* in Needleman, J., *op. cit.*, p. 112.
46 Gillespie, N. C., *op. cit.*, p. 147.
47 Martin Lings, *Ancient Beliefs and Modern Superstitions*, pp. 5-6.
48 *Ibid*, p. 5.

discussions (closed to all but a few outside observers), the evolutionists remained convinced that evolution is a fact. In reality, this was an affirmation of faith rather than of fact because, as *The New York Times* reported it, the assembled scientists were unable either to specify the mechanisms of evolution or to agree on "how anyone could establish with some certainty that it happened one way and not another."[49] One of the participants, Niles Eldredge, a paleontologist from the American Museum of Natural History in New York, declared: "The pattern we were told to find for the last 120 years does not exist."[50]

The above conflict and confusion among evolutionists only serves to confirm the belief of many critics of evolution that that is what is bound to happen once scientists start looking at the theory critically. This brings us to our second and third points. The increase in the volume of scientific criticisms in the beginning of the second half of this century can partly be attributed to a certain level of tolerance toward criticisms, in comparison to the earlier decades, as attested by the replacement of Arthur Keith's evolutionary hymn in the introduction to *The Origin* by Thompson's critical introduction in 1959. It also coincided with the beginning of skepticism of "progress" itself in the aftermath of the Second World War. As for the first half of the century, it was a period of unquestioned faith in evolution,[51] intellectual intolerance and dishonesty on the part of many evolutionists. Intellectual intolerance and dishonesty manifests themselves in many ways. For example, there are cases of intolerance in the form of opposition against those types of research work which seek to explain biological phenomena in non-evolutionary terms. One such case was the attempt of D'Arcy Thompson to explain embryological development in terms of actual physical causes rather than to be content with explanations of a phylogenetic nature, but this was rejected with contempt by authors like Haeckel and other evolutionists.[52] As for intellectual dishonesty, one may refer to the famous hoax connected with the

49 Richard L. Thompson, *op. cit.*, pp. 183-184.
50 *Ibid*, p. 185.
51 Thompson, F. R. S., *Science and Common Sense*, London (1937), p. 229.
52 W. R. Thompson, *op. cit.*, pp. 15-39.

alteration of the Piltdown skull so that it could be used as evidence for the descent of man from the apes.

On the question of usefulness of evolutionary theory to biology, many biologists have expressed the opinion that the latter would have achieved far greater progress had it not been addicted to evolutionary thinking. They do not dispute the fact that evolution has greatly stimulated biological research, but owing precisely to the nature of the stimulus a great deal of this work has been directed into unprofitable channels. Too much time, labor and scientific talent were wasted in the production of unverifiable family trees, the tracing of ancestries or the construction of hypothetical ancestors and unverifiable speculations on the origin of structures, instincts and mental aptitudes of all kinds. To the point raised by evolutionists that a vast amount of biological facts has been gathered in these studies, these critics express the belief that they could have been obtained more effectively on a purely objective basis.[53]

Scientific criticisms of evolution do not come from biologists only. There is also an increasing number of scientists in other disciplines, particularly physicists and mathematicians, who have criticized the theory of evolution from the viewpoint of present knowledge in their respective fields. Richard L. Thompson, an American mathematician who specialized in probability theory and statistical mechanics and who has done research in mathematical biology, has argued in his *Mechanistic and Non-mechanistic Science: An Investigation into the Nature of Consciousness and Form* that the theory of evolution is not actually supported by the factual evidence of biology and natural history. Drawing on ideas from information theory, Thompson shows that configurations of high information content cannot arise with substantial probabilities in models defined by mathematical expressions of low information content.[54] This means that complex living organisms, which possess a high information content, could not arise by the action of physical-chemical laws considered in modern science, since these laws are represented by mathematical models of low information content. Thompson defines the information content of a theory to be "the

53 *Ibid.*
54 See Thompson, R. L., *op. cit.*, p. 97.

length of the shortest computer program that can numerically solve the equations of motion for the theory to within any desired degree of accuracy."[55] His fundamental argument is that in a physical system governed by simple laws, any information present in the system after transformations corresponding to the passage of time must have been built into the system in the first place. Random events cannot give rise to definite information, even when processed over long periods of time according to simple laws. On the basis of these fundamental arguments in information theory, Thompson maintains that the existence of a complex order here and now cannot be explained unless we postulate the prior existence of an equivalent complex order or that the information content of the system has been received from an outside source.

The consequence for the idea of organic evolution is clear. The process of natural selection, accepted by many scientists as the mechanism of evolution, could not have brought about the development of complex living organisms because the laws of nature (currently conceived) underlying the process lack the necessary information content to specify its direction.

There are other scientists who with the aid of information theory have arrived at a similar conclusion concerning the current theory of evolution. The eminent British astronomer Sir Fred Hoyle and the distinguished astrophysicist Chandra Wickramasinghe, both of whom were once agnostics, draw the following conclusion from their study of recently assembled facts in such disciplines as microbiology, geology and computer technology: the complexity of terrestrial life cannot have been caused by a sequence of random events but must have come from some greater cosmic intelligence.[56]

It is not possible within the scope of this essay to go into the detailed scientific criticisms that have been put forward up till now against the evolutionary theory. The main message we seek to convey is that scientific opposition against evolution is gaining momentum. These scientific criticisms, coming as they are from different sciences, call into question the status of evolutionary doc-

55 *Ibid*, p. 105.

56 See Hoyle, Sir Fred and Wickramasinghe, N. C., *Evolution from Space. A Theory of Cosmic Creationism*, New York (1981).

trine as the integrative principle of all the sciences which is being claimed by many evolutionists.

Religious and Philosophical Criticisms

Besides scientific and metaphysical criticisms, there are the religious and philosophical ones. From the religious points of view the evidence against evolution is universal. In all sacred Scriptures and traditional sources whether they speak of creation in six days or of cosmic cycles lasting over vast expanses of time, there is not one indication that higher life forms evolved from lower ones. Says Professor Nasr: "The remarkable unanimity of sacred texts belonging to all kinds of peoples and climes surely says something about the nature of man."[57] As for philosophical criticisms, Thompson referred to the opinion of respectable philosophers who hold that the Darwinian doctrine of evolution involves serious difficulties which Darwin and others like Huxley were unable to appreciate. They argued that between the organism that simply lives, the organism that lives and feels, and the organism that lives, feels and reasons, there are abrupt transitions corresponding to an ascent in the scale of being and that the agencies of the material world cannot produce transitions of this kind.[58] Philosophers such as Michael Polanyi and Karl Popper have criticized the current theory of evolution, though their philosophical alternative is unacceptable from the view point of metaphysics. Says Polanyi:

> Scientific obscurantism has pervaded our culture and now distorts even science itself by imposing on it false ideals of exactitude. Whenever they speak of organs and their functions in the organism, biologists are haunted by the ghost of "teleology." They try to exorcise such conceptions by affirming that eventually all of them will be reduced to physics and chemistry. The fact that such a suggestion is meaningless does not worry them . . . the shadow of these absurdities lies deep on the current theory of evolution by natural selection.[59]

57 Nasr, S. H., *op. cit.*, p. 237.

58 W. R. Thompson, *op. cit.*, pp. 15-39.

59 Polanyi, M., *Knowing and Being*, University of Chicago Press, Chicago (1969), p. 42.

Conclusion

What do all these criticisms, metaphysical, scientific, religious and philosophical, mean to the future of the theory of evolution? We have no doubt that if the theory is allowed to be scrutinized critically and openly by all interested parties the collapse of evolutionary theory is in sight. The skepticism that is now current of the idea of progress will also have a great impact on the future of evolution since it has been the very basis of its origin, ascendancy and survival. Anyway there are already those who are very definite about what is going to happen to the theory. Says Tom Bethell:

> Darwin's theory, I believe, is on the verge of collapse. . . . He is in the process of being discarded . . .[60]

The Nature and Extent of Criticism of Evolutionary Theory
by Osman Bakar

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60 Quoted by Huston Smith, *Forgotten Truth: The Primordial Tradition*, Harper and Row, New York (1977), p. 134.