CRITIQUE OF EVOLUTIONARY THEORY

A Collection of Essays

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Contents

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Preface

The essays assembled in this book bring into focus a broad range of criticisms of the modern theory of evolution: logical, mathematical, physical, biological, religious, philosophical, and metaphysical. The arguments presented here are all intellectual in nature. These intellectual criticisms are of a different kind from the popular religious reactions and opposition to the theory, which may generally be characterized as sentimental or emotional in nature. They deserve to be studied in a serious and objective manner by present-day scholars, particularly biologists.

This book conveys, among others, this important message: Contrary to what many scientists think, the alternative to evolutionary theory need not necessarily be any of the different forms of creationism that are in vogue today in many religious circles such as those associated with the Christian fundamentalist movement in the West. The alternative highlighted by the contributors is the traditional doctrine of the gradation of beings.

It is our hope that this collection of essays would succeed in generating a greater interest in the meaning and significance of this traditional doctrine and related ideas than currently shown so that these principles may once again find their legitimate and worthy applications in contemporary biological sciences.

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Osman Bakar

In the Name of God, Most Merciful, Most Compassionate

Introduction

The earth shall never be empty of the "witness of God" (*a ḥadīth*)

The aim of this book is to present the other point of view in the century-old debate on evolution, a point of view that only until recently has been suppressed with uncharacteristic intolerance by the scientific community which claims itself as the champion of truth and scientific objectivity. This view is that evolution, *in the sense that all the organisms which constitute the whole of the plant and animal kingdoms that exist or have existed have developed from a few extremely simple forms or from one alone, by a process of descent with modification,* is at best an unproved scientific hypothesis if not just a wild conjecture that has been elevated to the rank of scientific truth by its exponents and accepted as such by the general public through sheer intellectual dictatorship as well as the public's blind faith in the moral integrity of scientists.

There is much that needs to be said about this view. First of all, there is the prevalent belief that this view is being maintained and upheld only by the non-scientific people especially those who have their religious views and interests at stake whereas all scientists are in complete agreement that evolution is an established scientific fact. However, the essays of this book clearly show that there are many scientists who oppose evolution on purely scientific grounds and view it as nothing more than a hypothesis that is yet to be proved if at all provable. In fact, as pointed out by the contributors of these essays, there is a growing volume of support in scientific circles for this standpoint. The status of a scientific fact is one that is no longer questioned by scientists because its truth has been scientifically proved. But how can this be so in the case

of evolution in the light of growing criticisms leveled against it? Furthermore, among the evolutionists themselves, though all believing in evolution, there is a great divergence and conflict of opinions not only about the causes of evolution but also about the actual process.

Why are disagreements about evolution never mentioned to the non-scientific public or in the writing of textbooks for students of biology? This brings us to a very important question, namely the popularisation of evolutionary doctrine through a kind of intellectual dictatorship that we have just mentioned. A good instance of this dictatorial reign of evolutionary idea on the minds of modern men was the difficulties encountered by D. Dewar, a contemporary scientist, in having his work published.[1] Dewar's work, *The Transformist Illusion,* which has assembled a vast amount of palaeontological and biological evidence against evolution is boycotted by the same libraries that have all his earlier works, written when he was an evolutionist. Practices of this kind are certainly unbecoming of the scientific community.

We insist that, in the pursuit of truth and intellectual progress, freedom of expression in all its forms is of fundamental importance. Truth cannot be arrived at and realized if our minds are systematically and routinely exposed to only errors and false ideas, more so when disguised as truths, and if the mental climate and accepted intellectual norms is such that we can only choose the most attractive of these errors and false ideas. This is a sure way to intellectual retardation and decay. Our remarks here apply in particular to the domain of biology. Other than the suppression of views critical of evolution mentioned earlier, we have also come across 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.[2] That these kinds of obscurantist practices do occur in science, not just as isolated cases of individual transgression against the sacred rules of scientific practice but as a general tendency within the scientific community, may come as a great shock to many of us for we have been taught to believe that science represents the liberation of the human mind, truth, reason and objectivity, development and progress as opposed to intellectual servitude, error, irrationality, superstition and decadence.[3] But of a still greater shock to us is the admission by certain scientists that they have deliberately tinkered with evidence in their over-zealous attempts to secure and furnish the necessary proofs for evolution. Thompson cited the case of the alteration of the Piltdown skull so that it could be used as evidence for the descent of man from the apes and the revelation by the discoverer of Pithecanthropus, many years after his sensational report, that he had found in the same deposits bones that are definitely human.[4] However, these disclosures which are now well-known facts were completely ignored.

If we have highlighted some of these undesirable practices in science which occur mainly in connection with the theory of evolution, it is not with the intention of undermining scientific integrity as such but rather to enhance and preserve it. It is the evolutionists themselves who have brought about a decline in scientific integrity through their own reckless statements,

1. See Nasr, S. H., *Man and Nature: The Spiritual Crisis of Modern Man,* Foundation for Traditional Studies, Kuala Lumpur (1986), p. 140, note 21, chapter *IV.* (See note 3, *Essay Two* of this book)

2. See *Essay One* by W. R. Thompson, p. 33
3. *Ibid,* p. 32
4. *Ibid,* p. 34

devious argumentations and unscientific behaviour.[5] What we wish to see is a more objective attitude towards the theory. It is only logical and pertinent to ask why evolutionists refuse to submit evolutionary speculation to a methodological and scientific criticism of the same severity as those employed in other departments of biology.

If evolutionists are fully convinced of the truth of their own doctrine, then they have nothing to fear of any criticism from whatever source. On the other hand, if they are not convinced of it but still rally to its defence because of what they percieve as the absence of a plausible alternative explanation or principle, then they ought to welcome and even encourage scientific criticisms so as to establish the real truth. This is what objectivity demands. But their non-scientific behaviour and reactions towards criticisms can only be interpreted in one way: that they are harboring a certain fear. And it is not difficult to guess what this fear is. For evolutionists very well know the implications of the collapse of evolutionary theory to their own positions, both in respect to their personal "religious" views and their academic prestige and status within the scientific community conferred upon by the evolutionary theory.

There are biologists who maintain that evolutionary doctrine must be defended at all costs because of its status and role as a supreme integrative principle without which biology becomes unintelligible and progress in biology impossible.[6] This claim is unacceptable. There are three main objections to this line of thinking. First, for a particular idea to assume the role of a supreme integrative principle in the sciences, then it

5. *Ibid*, p.34

6. The celebrated geneticist, Theodosius Dobzhansky, represents this viewpoint when he remarks: "Nothing in biology makes sense except in the light of evolution." See the article, "Putting Darwin Back in the Dock," *Time Magazine*, March 16, 1981, p. 34

must be truly supreme and integrative by virtue of the fact that it has withstood all tests and criticisms directed against it. But clearly this is not so in the case of evolutionary doctrine. Second, there is an alternative integrative principle which has been applied in pre-modern biological sciences. This is the traditional doctrine of gradation of beings. Third, it is debatable whether evolutionary theory has been an unadulterated benefit to biology and to mankind. All the points raised in these objections are taken up at various places in the different essays of this book.

Let us have a closer look at each of these objections. Concerning the first objection, we remarked earlier that the dominance and supremacy of evolutionary doctrine is made possible thanks, among other things, to the suppression of criticisms, rather than mainly through the appealing power of its own truth and rationality which in reality it does not possess. Several essays in this work reveal a yet more important factor, namely the eclipse of authentic metaphysical teachings in the West especially concerning the life sciences. In other words, there was no serious doctrinal challenge to evolutionary theory until recent times.

Neither can evolutionary doctrine be considered as truly integrative because even within the natural sciences, let alone in relation to such domains as the religious and philosophical sciences, it finds itself in conflict such as with information theory (see *Essay Eight*) and with certain established laws like the law of entropy in physics (see *Essay Two*). The function of a truly integrative principle is to integrate all facts and knowledge in its domain of application into a harmonious whole.

The idea of an alternative integrative principle in the biological sciences, mentioned in the second objection, is much emphasized by several of our contributors. The suggested alternative, the doctrine of gradation of beings – the

marātib al-mawjūdāt of Islamic tradition and the *Great Chain of Being* of Western tradition – is a metaphysical principle. As such, its explanation is to be found in metaphysics. We are told in this book, and this no doubt will surprise many people, that the modern idea of organic evolution is none other the traditional doctrine of gradation of beings reduced to its purely horizontal and temporal form. In the traditional view, gradation of beings refers primarily to a vertical hierarchy stretching from the lowest material form through man to God. Gradation in this sense is essentially qualitative and supra-temporal in nature. The temporal aspect of gradation is, however, not denied or ignored. The *Ikhwān al-Ṣafā' (The Brethren of Purity),* a brotherhood of Muslim scientists and philosophers who flourished in the tenth century, tell us in their writings that the coming into beings of the sublunary region after the heavens, the minerals after the elements, plants after minerals, animals after plants, and man after aminals, is temporal as well as in principio.[7] The Ikhwan's reference to the above temporal process leading to the appearance of man has led certain scholars to brand them as evolutionists or the forerunners of Darwin. But the Ikhwan themselves say:

> The species and genus are definite and preserved. Their forms are in matter. But the individuals are in perpetual flow; they are neither definite nor preserved. The reason for the conservation of forms, genus and species, in matter is the fixity of their celestial cause because their efficient cause is the Universal Soul of the spheres instead of the change and continuous flux of individuals which is due to the variability of their cause.[8]

7. See Nasr, S. H., *An Introduction to Islamic Cosmological Doctrines*, Shambhala, Boulder (1978), p. 73.
8. *Ibid,* p. 72.

The above-quoted passage clearly shows that the Ikhwan subscribed to the traditional doctrine of gradation of beings, and not to the idea of evolution in the modern sense. To call the Ikhwan evolutionists is to misunderstand the whole traditional conception of the gradation of beings. In the modern world, this doctrine is in fact largely forgotten. Of late, however, there is a reassertion of the true meaning and import of this idea in certain academic circles in the West (see *Essay Eight*). There is an urgent need for its dissemination to a larger intellectual audience. One of the pitiful states of modern knowledge is that it lacks the necessary principles (which can only be of an intellectual or spiritual order) to integrate the vast amount of data gathered in the various sciences into a coherent whole. The revival of the traditional doctrine of gradation of beings and related principles can help restore unity, order, and harmony in the domain of human knowledge.

In Islamic civilization, for example, the application of that doctrine in the biological sciences did not in any way make those sciences less intelligible and comprehensible. Nor did it prevent Muslim scientists from carrying out empirical studies of the natural order and from making important contributions to the field of natural history, a field of study which includes the modern disciplines of geography, geology, botany, zoology, and anthropology.

The doctrine of gradation of beings was applied as an integrative principle not only of the biological sciences but also of the other natural sciences, the cosmological, social and political, as well as the religious sciences. In other words, there are common fundamental principles underlying the integration of all these different sciences.

In the third objection, we encounter another important theme highlighted in this book, namely the question of the usefulness of evolutionary doctrine to biology (see *Essays One* and *Eight*). Several biologists have expressed the opinion that

biology would have achieved far greater progress had it not been addicted to evolutionary thinking. W. R. Thompson, for example, complains of a great waste of scientific talent in studies and researches aimed at verifying family trees, tracing ancestries, and producing new species. R. Fondi, quoted by Nasr (*Essay Seven*), views Darwinism and Lamarckism as burdens upon the science of biology. Says Fondi:

> Biology will not get any advantage out of the attitudes of Lamarck, Darwin and the modern hyper-Darwinists; on the contrary, it must soon move out of the constraints and the blind alleys of the evolutionary myth, to take again its safe way along the open and bright paths of Tradition.[9]

If biology itself has benefited little from the theory of evolution, then no other branch of knowledge could have been better off. Of course, to the exponents and propagandists of evolution, the theory represents a great leap forward in man's intellectual progress and a liberation of the human mind from the bondage of superstitious beliefs which, to them, also include true religious beliefs. No less a figure than Sir Arthur Keith himself had said that Darwin had done more than anyone to lift the pail of superstition from mankind and described Darwinism as a 'basal doctrine in the rationalist liturgy'. No doubt he was referring to the decline of Christianity in the West and Darwinism as the main cause of that decline. But to its critics and opponents, the advent of evolutionary doctrine and its immense influence, which no other theory connected with a particular science has ever acquired, have only brought about an unprecedented intellectual and moral crisis in the history of human civilization. It has destroyed the religious faiths of many people, undermined the faiths of many others and shaken the moral systems of many cultures

9. Sermonti, G. and Fondi, R., *Dopo Darwin*, Milan (1980), quoted by Nasr (see *Essay Seven*).

and religions to their very foundations.

As far as the intellectual dimension of the crisis is concerned, besides the intellectual and mental climate of intolerance it has produced, evolutionary doctrine has also presented philosophy and metaphysics with serious problems which evolutionists do not fully appreciate or just wish to ignore. Some of these problems are touched upon by Nasr in essay two of this book. And Thompson specifically refers to the problem of abrupt transitions which exist between plants, animals and man and the fact that this cannot be explained purely in terms of material causes as is sought by evolutionary theory. Evolution has also placed serious obstacles in the path of those scientists and philosophers who seek to establish general biology on a truly scientific basis and who yearn to see a philosophy of biology that really does justice to the subject. It gave rise to various pseudo-philosophies, some of which seek to reconcile between evolution and religion and this must be regarded as dangerous because it adds further obstacles to the correct understanding of religious conception of Reality, the richness of which evolution has sought to destroy.

In the ethical and moral domain, the theory of evolution poses a serious challenge to ethical systems based upon divinely revealed principles which their adherents claim to be immutable and of a permanent nature. A logical consequence of the extension of evolutionary doctrine to the human order is that ethics too is viewed as a product of the evolutionary process so that it is meaningless to speak of a body of immutable moral principles. Biological evolution gave birth to a new conception of ethics, namely evolutionary ethics. This is the ethics conceived by people like Sir Julian Huxley and other prominent evolutionists.[10]

Huxley maintains that, for good or evil, the mechanism of

10. See Huxley, Sir Julian, "Evolutionary Ethics," in Philip Appleman (ed.), *Darwin*, A Norton Critical Edition, New York (1979), pp. 328-334.

biological or organic evolution has in the main been transferred into the social or concious level. Concious evolution was rendered both possible and inevitable, says Huxley, when social organization became self-producing just as biological evolution was rendered likewise when material organization became self-producing. Concious evolution occurred when the "evolving world-stuff," in the form of ancestral man, became capable of true speech and conceptual thought. Consequently, a new and apparently indefinite range of possibilities to human life is open to man.

Since concious evolution can and does take many directions, the desirable one under the prevailing circumstances, that which is to serve as the external standard for evolutionary ethics, is precisely that which is assigned the highest value in contributing to progressively higher levels of organization. This "desirable one" constitutes what is right. That which is judged to retard such an advance constitutes what is wrong. In ethical relativism, therefore, the ultimate guarantees for the correctness of labels of "rightness" and "wrongness" are to be sought for among the "facts of evolutionary direction" itself. In other words, man's ethical basis is rooted in his own concious evolution, that is in change and development, so that a complete or static certitude of ethical belief itself becomes unethical. This sums up the philosophy of evolutionary ethics.

Evolutionary ethics is clearly in direct conflict with religious ethics, such as that of Islam, which sees in man not only elements of change but also, and the more important, elements of permanence. This is not the place to go into a detailed discussion of evolutionary ethics and its conflict with religious ethics. In referring briefly to evolutionary ethics, we only seek to illustrate the point that the negative consequences and implications of evolutionary theory extend beyond the biological sciences, even to the domain of religion itself.

Evolutionary beliefs permeate modern western thought. In

the words of E. Shute, "evolution has become the intolerant religion of nearly all educated Western men. It dominates their thinking, their speech and the hopes of their civilization."[11] But views critical of evolution have never been extinguished in the West. Although critical views that have been put into writing come from the pens of only a small minority of Western intellectuals, some of whom are former evolutionists, they are shared by many others in both East and West. These views deserve to be heard and objectively examined and studied. For the minority view is not necessarily false just as the majority view is not necessarily true. The least that the contributors of this book expect from the present generation of scientists, philosophers, and intellectuals in other disciplines is the willingness to subject evolutionary theory to scholarly criticisms of every kind – scientific, mathematical, logical, philosophical, metaphysical and religious.

If the plea of this book is heeded then the real victor will be truth itself. Religion teaches that there is no right higher than that of truth. In Islam, The Truth (*al-Haqq*) is one of the Names of God.

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July 1986

11. E. Shute, *Flaws in the Theory of Evolution,* Nutley, N. Jersey (1976), p. 228.

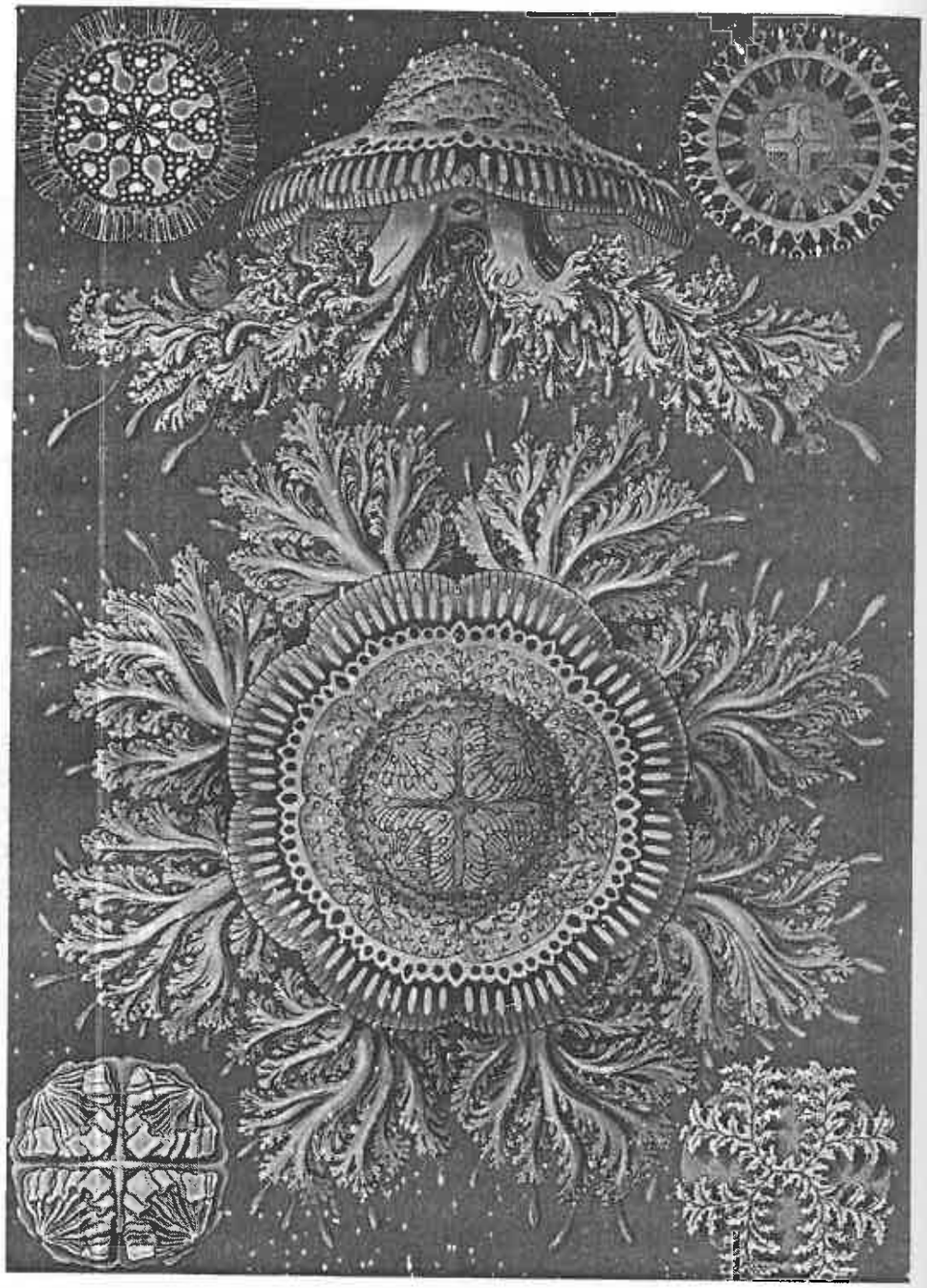

Plate 1. Various species of Rhizostomeae (an order of jellyfishes)

"We produced on earth all kinds of things in due balance and measure."
(Al-Quran, 15 : 19)

1

Essay One entitled *The Origin of Species: A Scientist's Criticism* was written by W.R. Thompson as an introduction to the 1958 edition of *The Origin of Species* by Charles Darwin, which is a revised version of 1859 publication and published by Everyman's Library, J.M. Dent & Sons Ltd. London. Thompson's introduction replaced the one prepared previously by the distinguished Darwinian, Sir Arthur Keith.

Thompson, himself a biologist, was formerly the Director of Commonwealth Institute of Biological Control, Canada.

Essay One

THE ORIGIN of SPECIES

A Scientist's Criticism

By W.R. Thompson

When I was asked by the publishers of this new edition of *The Origin of Species* to write an introduction replacing the one prepared a quarter of a century ago by the distinguished Darwinian, Sir Arthur Keith, I felt extremely hesitant to accept the invitation. I admire, as all biologists must, the immense scientific labours of Charles Darwin and his life-long, single-

hearted devotion to his theory of evolution. I agree that although, as he himself readily admitted, he did not invent the doctrine of organic evolution, or even the idea of natural selection, his arguments, and especially the arguments in *The Origin of Species*, convinced the world that he had discovered the true explanation of biological diversity, and had shown how the intricate adaptations of living things develop by a simple, inevitable process which even the most simple minded and unlearned can understand. But I am not satisfied that Darwin proved his point or that his influence in scientific and public thinking has been beneficial.

I therefore felt obliged to explain to the editors of the Everyman's Library, that my introduction would be very different from that of Sir Arthur Keith, and that I could not content myself with mere variations on the hymn to Darwin and Darwinism that introduces so many text-books on biology and evolution, and might well be expected to precede a reprinting of the *Origin*. They raised no objection, so my main difficulty was removed. I am of course well aware that my views will be regarded by many biologists as heretical and reactionary. However, I happen to believe that in science heresy is a virtue and reaction often a necessity, and that in no field of science are heresy and reaction more desirable than in evolutionary theory. I have written what I think should be written; but the responsibility of the editors of the library is not involved.

I have said that it was mainly *The Origin of Species* that converted the majority of men to the evolutionary doctrine. Sir Arthur Keith emphatically agreed. 'No book,' he said, 'has appeared to replace it. *The Origin of Species* is still the book which contains the most complete demonstration that the law of evolution is true.' But the more strongly we insist on this point, the more necessary it is to scrutinize the proofs given in

the *Origin*. Of course, we may be induced to accept a statement that is true, by agreements that are fallacious or inadequate. Still, no one would seriously maintain that it is good to do the right thing for the wrong reasons. If arguments fail to resist analysis, assent should be withheld, and a wholesale conversion due to unsound argument must be regarded as deplorable.

For Sir Arthur Keith, Darwin as a writer may be classed among the 'small select group of great Englishmen which holds Shakespeare.' The literary critics, apparently, did not agree with him. Though he has often been regarded as an obscure writer, Darwin usually expresses himself clearly enough. He was not interested in philosophical considerations or in the exact definition of the terms he used. In the final chapter of the first edition of *Origin*, where he recapitulates his arguments, the word evolution is not even mentioned; yet the proposition he is defending can easily be defined. This is, that all the organisms that exist or have existed have developed from a few extremely simple forms or from one alone, by a process of descent with modification. The mechanism of these transformations though infinitely complex in its detailed working, is very simple in principle. For reasons not fully understood organisms tend to vary slightly in their various characteristics. These variations must be called random in the sense that they have no predestined relation to the well-being of the organism. Nevertheless since they occur continually in many directions, an individual in which a particular variation has occurred will have a slight advantage over its competitors in a particular environment. The advantage will be transmitted to its progeny in which, owing to variation, it will be manifested in different degrees, and thus there will occur through successive generations, a progressive

adaptation to the environment from which the inadequately equipped competitors will disappear either through extinction or by adaptation to a different environment. We must, says Darwin, admit the truth of the following propositions: 'that gradations in the perfection of any organ or instinct, which we may consider, either do now exist or could have existed, each good of its kind — that all organs and instincts are, in ever so slight a degree, variable — and, lastly, that there is a struggle for existence leading to the preservation of each profitable deviation of structure or instinct.' These truths being admitted, the theory of descent with modification through natural selection, must be accepted. This explanation has universal value. It enables us to understand that every mental power and capacity has been a gradual but necessary acquirement and thus the origin and history of man become scientifically comprehensible. And as the past has been, so will the future. We may look with some confidence, says Darwin, 'to a secure future of equally inappreciable length. And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection.'

The view that natural selection, leading to the survival of the fittest, in populations of individuals of varying characteristics and competing among themselves, has produced in the course of geological time gradual transformations leading from a simple primitive organism to the highest forms of life, without the intervention of any directive agency or force, is thus the essence of the Darwinian position. Purposeless and undirected evolution, says J.S. Huxley, eventually produced, in man, a being capable of purpose and of directing evolutionary change. This, it appears to me, remains the view of the most representative modern Darwinians. It is true that Darwin himself admitted a Lamarckian element, the effects of use and disuse, and Sir Arthur Keith defended him

against those who accused him of relying exclusively on natural selection. But this, in the modern view, would be a virtue of Darwin's theory since the inheritance of acquired characters is now generally denied by biologists.

We must now examine the arguments in the 'demonstration that the law of evolution is true'.

Darwin's first argument, to which he devoted a great deal of labour, is that there is great variation among the individuals of many species. This variation is particularly evident among domesticated animals and plants. From these undeniable facts Darwin drew several conclusions. One was that species are not strictly immutable as biologists commonly maintained. The difference between the various types of domesticated species is often much greater than that which exists between wild species, and even in these it is often extremely difficult to decide whether a particular form is a species or a variety. The great difference in the forms of domesticated species shows, on the one hand, that variation can be stimulated by particular conditions and that the artificial selection made by breeders has produced forms with extremely distinctive characteristics.

The differences between the various species of violets or between the species of the hymenopterous genus *Mesoleius*, for example, are clearly far less striking than the differences between a pekinese and an Irish setter, or between a snow apple and a russet. Darwin points out that under certain conditions abnormal individuals are produced, and he maintains that it is impossible to draw a line between such monstrosities and the individuals regarded as normal. These converging arguments indicate that what we call a species is just a transitional stage in a genealogical succession which cannot at any time be regarded as having a permanent definable essence or nature. There is therefore no intrinsic obstacle to unlimited evolution and the extrinsic conditions for it exist.

That natural selection directs the course of evolution Dar-

win could not prove by an appeal to facts. However, he felt certain that all organisms tend to increase in geometrical ratio, that each lives by a struggle for its requirements at some period of its life and that among individuals differing even to a slight degree, the fittest must survive and transmit their characteristics to their offspring and, since these will continue to vary, natural selection will progressively improve the adaptations and equipment of each species. 'What checks the natural tendency of each species to increase in number,' said Darwin, 'is most obscure .....' 'We know not exactly what the checks are even in one single instance.' He was able to show from factual examples that there is a great destruction of individuals in nature and to indicate some of the causes of this destruction; but he had little detailed evidence to offer concerning the action of natural selection.

Whether or not natural selection has produced the existing and past diversity of organic forms, this diversity exists, not only in space but in time. Such facts as the presence of different species of the same genus in different islands, in the same area are consonant with the idea of descent with modification from a common ancestor as is the absence in isolated islands of organisms without active powers of migration and the presence of others such as bats and birds, taxonomically related to those of mainland areas.

Other supporting arguments were advanced by Darwin: the slow change and apparent progression of organic forms in the geological strata; the evidence of the existence in the past of a great variety of organisms now extinct; the similarity between the embryonic stages of organisms quite distinct in the adult condition; the existence of rudimentary organs; and the fact that a natural classification of organisms is possible, since this indicates real blood relationship and is therefore in a sense a mirror of the genealogical system by which they arose.

I have tried to include in a necessarily brief summary the

most important points in Darwin's argument and have not designedly attempted to weaken the presentation. If Darwin convinced the world that species had originated through evolution by natural selection, it was, I think, on the basis of the arguments I have mentioned.

But in a matter of this kind a great deal depends on the manner in which arguments are presented. Darwin considered that the doctrine of the origin of living forms by descent with modification, even if well founded, would be unsatisfactory unless the causes at work were correctly identified, so his theory of modification by natural selection was, for him, of absolutely major importance. Since he had at the time the *Origin* was published no body of experimental evidence to support his theory, he fell back on speculative arguments. The argumentation used by evolutionists, said de Quatrefages, makes the discussion of their ideas extremely difficult. Personal convictions, simple possibilities, are presented as if they were proofs, or at least valid arguments in favour of the theory. As an example de Quatrefages cited Darwin's explanation of the manner in which the titmouse might become transformed into the nutcracker, by the accumulation of small changes in structure and instinct owing to the effect of natural selection; and then proceeded to show that it is just as easy to transform the nutcracker into the titmouse. The demonstration can be modified without difficulty to fit any conceivable case. It is without scientific value, since it cannot be verified; but since the imagination has free rein, it is easy to convey the impression that a concrete example of real transmutation has been given. This is the more appealing because of the extreme fundamental simplicity of the Darwinian explanation. The reader may be completely ignorant of biological processes yet he feels that he really understands and in a sense dominates the machinery by which the marvellous variety of living forms has been produced.

This was certainly a major reason for the success of the *Origin.* Another is the elusive character of the Darwinian argument. Every characteristic of organisms is maintained in existence because it has survival value. But this value relates to the struggle for existence. Therefore we are not obliged to commit ourselves in regard to the meaning of differences between individuals or species since the possessor of a particular modification may be, in the race for life, moving up or falling behind. On the other hand, we can commit ourselves if we like, since it is impossible to disprove our statement. The plausibility of the argument eliminates the need for proof and its very nature gives it a kind of immunity to disproof. Darwin did not show in the *Origin* that species had originated by natural selection; he merely showed, on the basis of certain facts and assumptions, how this might have happened, and as he had convinced himself he was able to convince others.

But the facts and interpretations on which Darwin relied have now ceased to convince. The long-continued investigations on heredity and variation have undermined the Darwinian position. We now know that the variations determined by environmental changes — the individual differences regarded by Darwin as the material on which natural selection acts — are not hereditary. We can, by selection, sort out from a natural population a number of pure lines or genotypes, each possessing with respect to a given character its special curve of variability; but we cannot change this curve by selection within the genotype. For example, in a certain pure line of the house-fly, those with the longest wings may conceivably have an advantage — though I cannot see how this could be demonstrated. But we cannot, by choosing and mating these long-winged flies, produce a progressive increase in wing length.

It is true that some variations are hereditary. These are the so-called mutations which do not develop gradually but ap-

pear suddenly and remain as they appeared. The varieties of domesticated plants and animals are the result of mutations. But such forms must be eliminated in nature, which would otherwise present a spectacle entirely different from the reality. This is partly due to the fact that mutations are not adaptive. If we say that it is only by chance that they are useful, we are still speaking too leniently. In general, they are useless, detrimental or lethal. Darwin himself did not think that the races of domesticated animals were capable of surviving in nature, but the modern Darwinians are obliged to explain evolution as the result of mutations. If we minimize or at least limit the survival value of characters in general, we can agree that certain distinctive morphological dispositions may well be the result of mutations. But the neo-Darwinians hold firmly to the belief that every specific character has survival value. This to my mind puts them in a very awkward position.

To realize how unconvincing their position is, we have only to consider the fact of organic correlation. Strangely enough, though Darwin was evidently well acquainted with the work of Cuvier he pays practically no attention, in the *Origin,* to Cuvier's principle of adaptive correlation. For him correlation is merely a concurrence of characters like 'the relation between blue eyes and deafness in cats, and the tortoise-shell colour with the female sex, the feathered felt and skin between the outer toes of pigeons, and the presence of more or less down on the young birds when first hatched, with the future colour of their plumage; or, again, the relation between the hair and teeth in the naked Turkish dog.' Indeed Darwin's remarks suggest that he thinks of correlation as a material connection between malformations rather than as an adaptation. His modern disciples in general simply ignore the problem of correlation. However, to ignore it is easier than to solve it. As Emile Guyenot has said, mutations are powerless to explain the general adaptation which is the basis of organization. 'It is

impossible to produce the world of life where the dominant note is functional organization, correlated variation and progression, from a series of random events.' The position therefore is that while the modern Darwinians have retained the essentials of Darwin's evolutionary machinery, to wit, natural selection, acting on random hereditary variations, their explanation, plausible in Darwin's day, is not plausible now.

It has been said that the substitution of particulate for blending inheritance removed what was a serious difficulty in Darwin's own position. The interference with progressive evolution resulting from blending inheritance was certainly a weakness in the argument of the *Origin* but, as I have said, particulate inheritance has introduced other difficulties.

An important point in Darwin's doctrine, as set out in the *Origin*, was the conviction that evolution is a progressive process. We may look forward, he said, to a secure future of inappreciable length. 'And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection.' The Victorians accepted this idea with enthusiasm. Here I need only say that on this point Darwin was inconsistent since, in his view, natural selection acts not only by the survival of the fittest but also by the extermination of the less fit and may produce anatomical degradation as well as improvement.

That owing to the existence of different genotypes within a species and the somewhat different adaptive characters of these genotypes, samples of a widespread population taken at different points may be recognizably different in various ways, or a population of this kind spreading from a centre (as in the case of an introduced insect) may develop local varieties sufficiently marked to be regarded as species by a taxonomist, may be freely acknowledged. Furthermore, when we consider the development of a complex organism from the structurally simple germ cell, we must recognize that in this field, at least, evolution, in the classical sense, is a fact accessible to direct observation. But it is a far cry from these facts to the speculations of the *Origin* and the Victorian concept of evolution.

It is hardly necessary to dwell at length on all the minor arguments advanced by Darwin. These consist essentially in a translation of certain facts in terms of evolutionary theory, or, in other words, on an historical basis. If an organism possesses a structure having no assignable function, but looking like a reduced specimen of a functional structure existing in some other form, it was regarded as a 'rudiment' whose existence is explicable only as a relic that has gradually degenerated in coming down from a remote ancestor, where it was well developed and functional.

It is clear that this supposition has no demonstrative value. It itself requires demonstration. Unless one adopts the Darwinian postulate that all characteristics have survival value, it is not necessary to assume that they have, or ever had, definite functions. Some so-called rudiments, such as the homologues of the mammary glands in man cannot, so far as any plausible evidence goes, have been inherited from an ancestor in which they were functional. Others, once believed to be useless, have definite functions. The existence in whales of transitory teeth and of small bones buried in the flesh, but corresponding to the pelvis, the femur, and the tibia, is commonly regarded as a proof of their descent from ancestors of the tetrapod type with functional teeth; but in the first place some anatomists consider that these structures have an important role in developmental process; in the second place, we have no proof of a descent from ancestors in which these structures were more strongly developed; in the third place, it is clear that if they exist now, this is not primarily because they existed in the past, but because actual present causes now operate to produce them. What such cases like those of anatomical 'con-

vergence' and general homology actually demonstrate is that there are large numbers of organisms, differing considerably in the details of structure but constructed on the same fundamental plan. However, this is no proof of descent from one original ancestor of this anatomical type. This itself requires proof. It may be said that unless we admit this, we must make the much more difficult supposition that many complex types originated independently. This, it will be remembered, was a point Darwin made against Lamarck. But I, for my part, do not see that I am obliged to express a view on such matters. Darwin himself considered that the idea of evolution is unsatisfactory unless its mechanism can be explained. I agree, but since no one has explained to my satisfaction how evolution could happen I do not feel impelled to say that it has happened. I prefer to say that on this matter our information is inadequate.

Darwin suggested in the *Origin* that embryological development provides evidence for evolution. He postulated that characteristics appear in the embryo at the stage in which they developed in the ancestor, so that new developments may be tacked on, so to speak, to a phase representing the ancestral development, since Darwin also held that the slight variations on which, in his view, evolution depends, 'generally appear at a not very early period of life.' This idea, elaborated by other workers, eventually became in the hands of Haeckel the 'great biogenetic law,' according to which the ontogeny repeats the phylogeny, or, as propagandists have put it, the developing animal 'climbs up its family tree.'

A natural law can only be established as an induction from facts. Haeckel was of course unable to do this. What he did was to arrange existing forms of animal life in a series proceeding from the simple to the complex, intercalating imaginary entities where discontinuity existed and then giving the embryonic phases names corresponding to the stages in

his so-called evolutionary series. Cases in which this parallelism did not exist were dealt with by the simple expedient of saying that the embryological development had been falsified. When the 'convergence' of embryos was not entirely satisfactory, Haeckel altered the illustrations of them to fit his theory. The alterations were slight but significant. The 'biogenetic law' as a proof of evolution is valueless.

A more important argument in the opinion of Darwin himself was the possibility of classifying organisms. All true classification, he said, is genealogical. Community of descent 'is the hidden bond which naturalists have been unconsciously seeking.' The arrangement of the groups within each class, 'in due subordination and relation to the other groups, must be strictly genealogical in order to be natural.' And again, 'the natural system is genealogical in its arrangement, like a pedigree; but the degrees of modification which the different groups have undergone have to be expressed by ranking them under so-called different genera, sub-families, section, orders, and classes.' What we call the natural system of classification is a proof of evolution since it can only be explained as a result of evolution.

The plausibility of this argument is obvious. Yet it is not so convincing as it may appear at first sight. In the Darwinian theory, evolution is essentially undirected, being the result of natural selection, acting on small fortuitous variations. The argument specifically implies that nothing is exempt from this evolutionary process. Therefore, the last thing we should expect on Darwinian principles is the persistence of a few common fundamental structural plans. Yet this is what we find. The animal world, for example, can be divided into some ten great groups or phyla, all of which are not morphologically as coherent and clear-cut as we might wish for convenience in classification, but nevertheless are stable and definable entities from the taxonomic standpoint. All identifiable animals that

ever have existed can be placed in these groups. Generally speaking, the subordinate groups are equally well defined. We can tell at a glance to what Order or Family a particular insect belongs. As I have already noted there is often controversy and uncertainty about the definitions of genera, species, and varieties; but taking the taxonomic system as a whole, it appears as an orderly arrangement of clear-cut entities which are clear-cut because they are separated by gaps. These gaps Darwin explained by the hypothesis that the intermediates are constantly eliminated by natural selection. I do not think we can be expected to accept this unproved supposition as an argument for Darwinism. But in any case it has no bearing on the persistence throughout geological time, in spite of the fortuitous variation and natural selection, on the persistence of the fundamental anatomical plans exhibited by the great groups. Darwin insisted on several occasions that characteristics long inherited became stabilized and perhaps he considered that the persistence of morphological types can be explained in this way. But without introducing considerations quite foreign to his system, we cannot explain why the anatomical type of the Echinoderm or the Insect continued to be inherited.

Because all organisms we know are generated by other organisms, it is natural to interpret biological classification in terms of genealogy. But not all the things that can be classified are connected by generation. The arrangement of the chemical elements and their compounds is a true classification and so is the arrangement of geometric forms; yet no genealogical considerations are involved. Looking at the matter from this angle, we can easily see that in actual fact the system of biological classification is simply based on the characteristics of organisms as they are here and now. The basis of these characteristics here and now is the physico-chemical constitution. If we wish to erect a genealogical classification we cannot

do so with a collection of abstractions drawn from our arrangement of existing organisms.— we must discover through what forms the existing organisms have actually descended. If these historical facts cannot be ascertained, then it is useless to seek for substitutes, and from the fact that a classification is possible we certainly cannot infer that it is genealogical and is in any sense a proof of evolution.

Evolution, if it has occurred, can in a rather loose sense be called a historical process; and therefore to show that it has occurred historical evidence is required. History in the strict sense is dependent on human testimony. Since this is not available with respect to the development of the world of life we must be satisfied with something less satisfactory. The only evidence available is that provided by the fossils. It has been pointed out by both supporters and opponents of the evolutionary doctrine, that even if we can demonstrate the chronological succession of certain organisms, this is not proof of descent. This may seem like a quibble. If we put a pair of house-flies in a cage and let them breed, we do not doubt that the live flies we find there in a month's time are the descendants of the original pair. Similarly, if in an apparently undisturbed geological formation we find snail shells at an upper level very similar to those at a lower level, we may reasonably conclude that there is some genealogical connection between the two groups, though we cannot trace the descent from individual to individual as is required in a true family tree. Therefore, if we found in the geological strata a series of fossils showing a gradual transition from simple to complex forms, and could be sure that they correspond to a true time-sequence, then we should be inclined to feel that Darwinian evolution has occurred, even though its mechanism remained unknown. This is certainly what Darwin would have liked to report but of course he was unable to do so. What the available data indicated was a remarkable absence of the many in-

termediate forms required by the theory; the absence of the primitive types that should have existed in the strata regarded as the most ancient; and the sudden appearance of the principal taxonomic groups. Against these difficulties he could only suggest that the geological record is imperfect, but that if it had been perfect it would have provided evidence for his views. It is clear therefore that the palaeontological evidence at his disposal, since it had not led competent naturalists acquainted with it to a belief in evolution, could only justify a suspense of judgment. The condition of fossil material is, of course, unsatisfactory since soft tissues usually disappear, leaving only skeletal structures, frequently much distorted. The fossil insects of the group with which I am best acquainted cannot be accurately determined, even to genera. It is evident that many organisms now extinct existed in the past, but we can never know them as we know living forms. The chronological succession of the fossils is also open to doubt, for it appears, generally speaking, that the age of the rocks is not determined by their intrinsic characteristics but by the fossils they contain; while the succession of the fossils is determined by the succession of the strata. It was thought also that the fossils should appear in a certain order, corresponding roughly to the stages in embryological development. In fact the strata, and therefore the fossils they contain, do not always occur in the accepted order. In some areas of the world, for example, the Cambrian strata, which are regarded as the oldest fossiliferous formations, rest on the Cretaceous which are regarded as relatively recent; in others, Cretaceous or Tertiary beds appear, instead of the Cambrian, on the granite. Sometimes the character of the deposits would lead to the belief that they were chronologically continuous since they can be separated only by the fossils they contain. Various hypotheses have been proposed to explain these departures from accepted theory, and though they are often the subject of

controversy among geologists I do not suggest that the problems to which they relate are insoluble.

On the other hand, it does appear to me, in the first place, that Darwin in the *Origin* was not able to produce palaeontological evidence sufficient to prove his views but that the evidence he did produce was adverse to them; and I may note that the position is not notably different to-day. The modern Darwinian palaeontologists are obliged, just like their predecessors and like Darwin, to water down the facts with subsidiary hypotheses which, however plausible, are in the nature of things unverifiable.

It has been said that though we do not find in the geological deposits the intermediates required by Darwinian theory, some very striking intermediates have been found of which the classical oft-cited examples is *Archaeopteryx*. To me, however, it appears that since the geological strata probably represent environmental conditions very different from those of the present, collections made in them may be regarded something like those made on the continent of Europe or in the tropics, with respect to the fauna and flora of the British Isles. As the range of our collections extends, so we invariably enrich our representation of various groups, and this necessarily and inevitably entails the appearance of intermediates between the forms in the collection from the restricted area in which we started. The recognition of this fact, with respect to the collections of organisms existing here and now, does not necessarily commit us to any particular view of the origin of species; and the same thing is true of the collection of fossil material.

The Origin of Species converted the majority of its readers to a belief in Darwinian evolution. We must now ask whether this was an unadulterated benefit to biology and to mankind. Sir Arthur Keith, as we have seen, had no doubts about this point. Some of the Darwinian propagandists were even more

positive. Writing in his Anthropogeny of the evolutionary controversy, Haeckel asserted, that in this intellectual battle, which excites all the thinking sections of humanity, and prepares for the future a truly humane society, we see on one side, under the splendid banner of science, the liberation of the mind, truth, reason, civilization, development, and progress. In the other camp are ranged, under the banner of the hierarchy, intellectual servitude, error, irrationality, barbarous ways of life, superstition, and decadence. Quite recently an evolutionary propagandist has said, that without the evolutionary doctrine, biology, except in certain restricted fields, becomes unintelligible.

I find myself unable to agree with these views. I do not contest the fact that the advent of the evolutionary idea, due mainly to the *Origin*, very greatly stimulated biological research. But it appears to me that owing precisely to the nature of the stimulus, a great deal of this work was directed into unprofitable channels or devoted to the pursuit of will-o'-the-wisps. I am not the only biologist of this opinion. Darwin's conviction that evolution is the result of natural selection, acting on small fortuitous variations, says Guyénot, was to delay the progress of investigations on evolution by half a century. Really fruitful researches on heredity did not begin until the rediscovery in 1900 of the fundamental work of Mendel, published in 1865 and owing nothing to the work of Darwin. In his great work *Growth and Form.* D'Arcy Thompson remarked on the stultifying effect of Darwinian theory. 'So long and so far as "fortuitous variation" and the "survival of the fittest" remain engrained as fundamental and satisfactory hypotheses in the philosophy of biology, so long will these "satisfactory and specious causes" tend to stay "severe and diligent inquiry," "to the great arrest and prejudice of future discovery."' Much time was wasted in the production of

unverifiable family trees. For example, by plausible but unconvincing arguments zoologists have 'demonstrated' the descent of the Vertebrates from almost every group of the Invertebrates. During the thirty years from 1870 to 1900, there was an immense concentration of effort on embryology, inspired by the 'biogenetic law.' Here again the main objective was the tracing of ancestries. The attempt of his to explain development in terms of actual physical causes was rejected with contempt by authors like Haeckel. 'We have better things to do in embryology,' said one of them, 'than to discuss tensions of germinal layers and similar questions, since all explanations must of necessity be of a phylogenetic nature.' Gradually it was realized that the objective was unattainable. Embryology then ceased to be fashionable. Taxonomists also followed the trend, constructing hypothetical ancestors for their groups and explaining the derivation of existing forms from these imaginary entities. I do not of course deny that a great amount of valuable information was gathered in these studies, but I think it could have been obtained more effectively on a purely objective basis. My impression is, also, that though it was unproductive from the Darwinian standpoint, this was not usually admitted. The deficiencies of the data were patched up with hypotheses, and the reader is left with the feeling that if the data do not support the theory they really ought to.

A long-enduring and regrettable effect of the success of the *Origin* was the addiction of biologists to unverifiable speculation. 'Explanations' of the origin of structures, instincts, and mental aptitudes of all kinds, in terms of Darwinian principles, marked with the Darwinian plausibility but hopelessly unverifiable, poured out from every research centre. The speculations on the origin and significance of the resemblances between animals, or between animals and their environment and of the striking colour patterns they often ex-

hibit, constitute one of the best-known examples. In the article on 'Mimicry' in the 14th edition of the *Encyclopaedia Britannica* we find a remarkable explanation of the form of tropical insect belonging to the group of the 'lantern-flies.' The head of this insect, which is not very large, resembles, in miniature, the head of an alligator, being prolonged into a snout at the base of which is protuberance resembling an eye, while along the side are formations resembling minute teeth. Curious though the resemblance is, it is obviously a mere coincidence. The insect as a whole does not look anything like an alligator. However, for the Darwinian author of the article we have here an example of the development of protective resemblance by natural selection. The similarity of the head of the insect to the head of an alligator is a protection against monkeys. The monkey does not actually mistake the insect for an alligator but the sight of its head recalls to him the occasion on which an alligator almost seized him when he was drinking from a stream. Such is the effect of Darwinian fantasy on biological thinking.

The success of Darwinism was accompanied by a decline in scientific integrity. This is already evident in the reckless statements of Haeckel and in the shifting, devious, and histrionic argumentation of T. H. Huxley. A striking example which has only recently come to light, is the alteration of the Piltdown skull so that it could be used as evidence for the descent of man from the apes; but even before this a similar instance of tinkering with evidence was finally revealed by the discoverer of Pithecanthropus, who admitted, many years after his sensational report, that he had found in the same deposits bones that are definitely human. Though these facts are now well known, a work published in 1943 still accepts the diagnosis of Pithecanthropus given by Dubois, as a creature with a femur of human form permitting an erect posture. Not long ago (1947), an exhibit in London, designed for public

instruction, presented human development in such a way as to insinuate the truth of the 'biogenetic law', and in the same exhibit were problematic reconstructions indicating the descent of man and including the Piltdown type.

As we know there is a great divergence of opinion among biologists, not only about the causes of evolution but even about the actual process. This divergence exists because the evidence is unsatisfactory and does not permit any certain conclusion. It is therefore right and proper to draw the attention of the non-scientific public to the disagreements about evolution. But some recent remarks of evolutionists show that they think this unreasonable. This situation, where scientific men rally to the defence of a doctrine they are unable to define scientifically, much less demonstrate with scientific rigour attempting to maintain its credit with the public by the suppression of criticism and the elimination of difficulties, is abnormal and undesirable in science.

It is difficult to assess the effect of the *Origin* on the public mentality. It must be considered in conjunction with Darwin's later work: *The Descent of Man* and the writings of the supporters of Darwin in several countries. However, Sir Arthur Keith said that Darwin himself had done more than anyone to lift 'the pail of superstition' from mankind and, in another place, that Darwinism is a 'basal doctrine in the rationalist liturgy.' These remarks suggest that in his opinion the decline of belief in the supernatural, and probably the decline of Christianity, is largely due to the influence of Darwin. I think there is much to be said for this view. It is true that in the *Origin* Darwin speaks of life 'having been originally breathed into a few forms or into one', and refers to a Creator. Furthermore, he objected to the spontaneous generations for which Lamarck argued. But I think this objection was merely to an idea that would have made his own theory less comprehensively explanatory.

Although the *Origin* contains no direct attack on the Christian concept of the universe, it is, on a number of crucial points, opposed to this concept. The biblical account of the creation of living things can be, and often has been, interpreted in a manner more or less compatible with the doctrine of evolution. Propagandists like T. H. Huxley, however, made every effort to minimize this possibility, and to prove that Christian orthodoxy implies a literal interpretation of Genesis which is irreconcilable with the evolutionary idea. Darwin himself, though he once held some rather vaguely Christian views, abandoned them quite rapidly and soon ceased to believe in the Christian revelation.

The doctrine of evolution by natural selection as Darwin formulated, and as his followers still explain it, has a strong anti-religious flavour. This is due to the fact that the intricate adaptations and co-ordinations we see in living things, naturally evoking the idea of finality and design and, therefore, of an intelligent providence, are explained, with what seems to be a rigorous argument, as the result of chance. It may be said, and the most orthodox theologians indeed hold, that God controls and guides even the events due to chance; but this proposition the Darwinians emphatically reject, and it is clear that in the *Origin* evolution is presented as an essentially undirected process. For the majority of its readers, therefore, the *Origin* effectively dissipated the evidence of providential control. It might be said that this was their own fault. Nevertheless the failure of Darwin and his successors to attempt an equitable assessment of the religious issues at stake indicates a regrettable obtuseness and lack of responsibility. Furthermore, on the pure philosophical plane, the Darwinian doctrine of evolution involves some difficulties which Darwin and Huxley were unable to appreciate. Between the organism that simply lives, the organism that lives and feels, and the organism that lives, feels, and reasons, there are, in the opinion of respectable philosophers, abrupt transitions corresponding to an ascent in the scale of being, and they hold that the agencies of the material world cannot produce transitions of this kind. I shall not attempt to discuss this difficult question here. Nevertheless it is clear that the view just mentioned has been that of mankind in general. That plants, animals, and man can be distinguished because they are radically different is the common-sense conviction, or was, at least until the time of Darwin. Biologists still agree on the separation of plants and animals, but the idea that man and animals differ only in degree is now so general among them, that even psychologists no longer attempt to use words like 'reason or intelligence' in an exact sense.

This general tendency to eliminate, by means of unverifiable speculations, the limits of the categories Nature presents to us, is the inheritance of biology from *The Origin of Species.* To establish the countinuity required by theory historical arguments are invoked, even though historical evidence is lacking. Thus are engendered those fragile towers of hypotheses based on hypotheses where fact and fiction intermingle in an inextricable confusion. That these constructions correspond to a natural appetite there can be no doubt. It is certain also that in the *Origin* Darwin established what may be called the classical method of satisfying this appetite. We are beginning to realize now that the method is unsound and the satisfaction illusory. But to understand our own thinking, to see what fallacies we must eradicate in order to establish general biology on a scientific basis, we can still return with profit to the source-book which is *The Origin of Species.*

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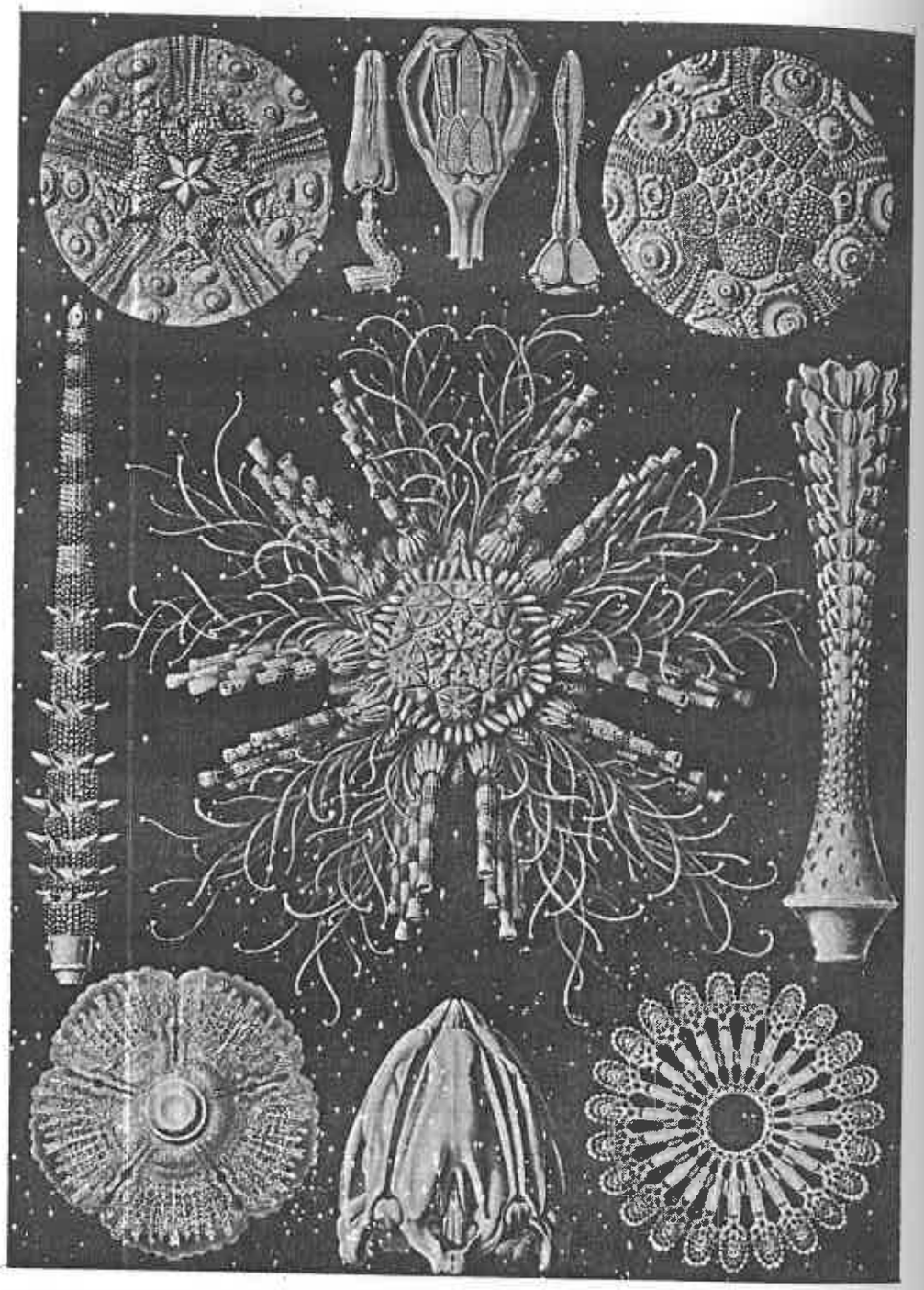

Plate 2. Various species of sea-urchins

"He is God the Creator,
the Shaper out of naught,
the Bestower of forms."
(Al-Quran, 59 : 24)

2

Essay Two is an extract of Seyyed Hossein Nasr's book entitled *Man and Nature, The Spiritual Crisis of Modern Man,* Foundation for Traditional Studies, Kuala Lumpur (1986), pp. 124-129. Previously entitled *The Encounter of Man and Nature,* Allen & Unwin, London (1968), the book is a spiritual tour de force which explores ideas about man and nature in Taoism, Buddhism, Christianity and Islam, particularly its Sufi dimension.

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Among his works are *An Introduction to Islamic Cosmological Doctrines, Ideals and Realites of Islam, Science and Civilisation in Islam, Islamic Science: An Illustrated Study, Three Muslim Sages, An Annotated Bibliography of Islamic Science (Vols. I and II), Islamic Art and Spirituality, and Traditional Islam and the Modern World.*

Essay Two

Evolution: A Metaphysical Absurdity

By Seyyed Hossein Nasr

In the domain of biology, one can hardly avoid mentioning the theory of evolution which has become fashionable in this century and has dominated nearly every branch of knowledge from astronomy to history itself. We have become accustomed to speaking about the evolution of the galaxies as well as of this or that tribe or society. Rarely in fact has a theory connected with a particular science had such wide acceptance, perhaps because the theory of evolution itself, instead of being a scientific theory that became popularized, began as a general tendency that entered into the domain of biology. For this very reason it soon gained acceptance more as a dogma than as a useful scientific hypothesis.

From the metaphysical point of view, the reality of a species is not exhausted by its purely material manifestations. Like other things the species is an 'idea' whose imprint in material form does not confine and exhaust its essential reality which remains independent of matter. A species could not evolve into another because each species is an independent reality qualitatively different from another. As is true of the domain of quality in general each quality is an independent reality even if materially produced by others as exemplified in the case of colours where a colour produced by the mixture of two other colours is itself a new and independent quality. As far as the species are concerned they are, from the metaphysical point of view, ultimately so many 'ideas' in the Divine Mind which at a particular cosmic moment have

become imprinted in the corporeal world and retain their reality on other planes of existence — whatever their careers and histories in the corporeal domain. Most of all, metaphysics and also logic cannot accept the possibility of the greater coming into being from the lesser, unless it is already there one way or another. Consciousness or the spirit could not evolve from matter unless it were already present anteriorly to matter, just as one could not physically lift an object against a gravitational field, unless there were already a reserve of energy in the mover.

Moreover, from the metaphysical point of view the effect can never be divorced from its cause. The world can never be totally separated from its Creator, and there is no logical or philosophical reason whatsoever to refuse the possibility of continuous creation or a series of creations as all traditional doctrines have held. 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.

In the light of this background, biologists and geologists have come to uphold the theory of evolution,[1] and usually

[1] One of the great French biologists writes, *'Bref, on nous demande ici un acte de foi, et c'est bien en effet sous la forme d'une vérité révelée que chacun de nous a reçu jadis la notion d'évolution.'* L. Bounoure, *Déterminisme et finalité double loi de la vie*, Paris, 1957. See also the same author's *Recherche d'une doctrine de la vie*, Paris, 1964, for a biological criticism of evolution and some of its defenders.

refuse even to submit it to a methodological and scientific scrutiny or allow it to be questioned like any other scientific hypothesis.[2] In most books written on the subject facts are marshalled in such a way as to present evolution as an established fact. Rarely have the views of respected scientists who have opposed evolution been presented, because evolution has come to gain a status in biological and geological circles very different from what one finds in any other science.

But opposition to the theory of evolution continues on scientific lines and in fact has increased in the past few years. It was not only the nineteenth century naturalists and biologists like Louis Agassiz who opposed Darwinian evolution, but also some contemporary scientists like Bounoure, Bertrand-Sernet, Collins, Clark Caullery, Lemoine, Dewar, Grant-Watson and many others.[3] The arguments presented by such men are all of a scientific nature rather than being theological or metaphysical. There is first of all the assertion made by Lemoine and others that the palaeontological evidence upon which evolutionists base their arguments in

[2] 'The concept of organic Evolution is very highly prized by biologists, for many of whom it is an object of genuinely religious devotion, because they regard it as a supreme integrative principle. This is probably the reason why the severe methodological criticism employed in other departments of biology has not yet been brought to bear against evolutionary speculation.' Thompson, *Science and Common Sense*, p. 229.

We recall once in a class of stratigraphy when we asked the professor a question which seemed to criticize the postulate of evolution he answered curtly, 'We no longer ask questions about evolution. We only accept and follow it.'

[3] Only too often the works of such authors have been deliberately neglected or suppressed. A case in point is the work by D. Dewar called the *Transformist Illusion*, Murfreesboro, 1957, which has assembled a vast amount of palaeontological and biological evidence against evolution. The author who was an evolutionist in his youth wrote many monographs which exist in the libraries of comparative zoology and biology everywhere. But his last work, *The Transformist Illusion*, had to be published in Murfreesboro, Tennessee(!) and is not easy to find even in libraries that have all his earlier works. There is hardly any other field of science where such obscurantist practices are prevalent.

fact contradicts evolution[4] and that the argument is circular.[5] The geologic record shows sudden explosions of new species which some evolutionists have sought to explain through the theory of 'quanta of evolution' (*tachygenesis*), or the 'systematic suppression of origins' proposed by Teilhard de Chardin. But neither of these theories stands scientific criticism, and the difficulty remains that contrary to evolutionary theory each new species makes its entrance upon the stage of life very suddenly and over an extended region.[6] Nor does the established fact that in the geologic record there is a gradation of fauna prove evolution of one form into another, since each fauna arises suddenly with all its essential characteristics.[7]

The great types of zoology have been shown by some scientists to be independent of each other and without a specific position on the palaeontological record.[8] The few cases where

[4] Lemoine, a French geologist, as the editor of a volume of the French encyclopaedia on Living Organisms after reviewing articles by different contributors on the palaeontological proofs of evolution writes; 'It follows from this account that the theory of evolution is impossible. In reality, despite appearances, no one any longer believes in it, and one speaks, without attaching any importance to it, of evolution to denote linkage — or more evolved, less evolved in the sense of more perfected, less perfected, because it is the conventional language, admitted and almost obligatory in the scientific world. Evolution is a kind of dogma, in which the priests no longer believe, but which they maintain for their people.' Quoted by Dewar in *Transformist Illusion*, p. 262.

[5] *'De là vient que l'évolutionisme repose tout entier sur une vaste pétition de principe: les faits paléontologiques sont utilisés pour prouver l'évolution et, à la fois, trouvent leur explication dans cette théorie inventée pour eux. C'est un magnifique exemple de* circulus vitiosus. Bounoure, *Déterminisme et finalité*, pp. 80-1.

[6] For a criticism of these theories which seek to provide an answer for the explosion of new forms see Bounoure, *op. cit.*, pp. 65 ff.

[7] *'Qu'il y ait eu, au cours des âges, une certaine gradation des formes, cela est certain, mais ne prouve nullement un rapport de descendence entre les differents groupes, dont chacun, au contraire, surgit brusquement,* de novo, *avec tous ses caractères essentiels.'* Bounoure, *op. cit.*, pp. 57-8.

[8] *'La majeure partie des types foundamentaux du regne animal se presentent à nous sans aucun lieu an point de vue paléontologique.'* C. Deperet, *Les Transformations du monde animal*, Paris, 1907, p. 76.

the actual process of transformation has been described by biologists have shown themselves, to be combined with obstacles which make them appear as miraculous, to say the least.[9] The family trees of biology first drawn by Haeckel, and now popular mainstays of books on biology, are shown to contain overt contradictions and to be based more on fantasy than on scientific evidence. These and many other arguments are presented by a minority of biologists and geologists whose voice the present mental climate does not allow to be fully heard.

In the whole question of evolutionary theory and its implications a clear distinction is not made between objective and subjective elements. Taken as a dogma, evolution is presented without considering biological cases which cannot be explained by it.[10] Likewise, the opposition of the evolutionary hypothesis to the law of entropy, and the implications it has in the light of the belief held by other sciences of the gradual running down of the whole corporeal universe, is rarely emphasized in general presentations of evolution which is made to appear as most logical and scientific. Most important of all, few bother to mention that in the world in which we live there is no evolution observed at all.[11] Nor have the experiments made to provide a laboratory case of the transformation of one species into another been successful.[12] What is

[9] See Dewar, *The Transformist Illusion*, Chapter XVII, 'Some Transformations Postulated by the Doctrine of Evolution.'

[10] See the various studies of E.L. Grant-Watson such as *Nature Abounding*, London, 1941; *Enigmas of Natural History*, London (n.d.), and *The Mystery of Physical Life*, London, 1964, where such cases are studied. The author seeks in these works to study the 'wisdom of nature' by turning to specific cases where this 'wisdom' is most directly manifested.

[11] *'Quoi qu'il en soit, dans le monde actuel, nous ne constatons aucun signe d'évolution; celle-ci parait exclue du monde vivant que nous avons sous les yeux et dont nous faisons partie.'* Bounoure, *Déterminisme et finalité*, p. 51.

[12] M. Caullery, *Le Problème de l'évolution*, Paris, 1931, p. 401; Bounoure, *op. cit.*, pp. 50-1.

more, there are species that have survived from the first geologic age without evolving at all. If we were to make a truly scientific statement about the world of life about us we would have to say in fact that nature presents to us species that are constant and unchanging but who occasionally die and disappear.[13]

If we have repeated these scientific criticisms of evolution here, it is not to open a biological debate but to distinguish between scientific facts and the philosophical assumptions that underlie them. A re-discovery of metaphysics would be particularly pertinent in this case because it would remove this philosophical obstacle and allow biological and geological facts to be discussed and debated, as in other sciences, without reliance upon evolution as a dogma which cannot be challenged. Furthermore, it would prevent the abuse of evolutionary theory in other fields, a practice which is very widespread to the extent that even contradictory philosophical views appeal to evolution as their 'scientific' justification.[14] This is particularly important as far as man's encounter with nature is concerned because pseudo-philosophies of this kind can do the greatest damage to the harmony between man and nature, by presenting man as the inevitable victor of a long struggle who therefore has the right to conquer and dominate all things or by destroying the spiritual significance of nature which depends precisely on the fact that it reflects an abiding and permanent reality beyond itself.

13 *'Elles [espèces] n'ont devant elles qu'une alternative: ou se maintenir inchangés, on s'éteindre.'* Caullery, *op. cit.*, pp. 84-5.

14 *'Le succès de la théorie évolutioniste, c'est le succès des personnes faciles, il n'est point de bio-philosophie qui ne recoure à cette fille complaisante: elle sert le matérialisme de Haeckel et de Lyssenko, le panthéisme de Teilhard de Chardin, le lyrisme éperdu de Saint-Seine, l'anti-hasard de Cuénot, le spiritualisme de Le Roy et de Leconte de Noüy, l'orthodoxie religieuse des prêtres, moines et princes de grand' clergie. Il existe aujourd'hui un scientisme clérical dont l'ardent empressement est manifeste pour l'évolution: chez celle-ci se reconcilient les passionés de l'athéisme et les croyants de stricte obédience.'* Bounoure, *op. cit.*, p. 78.

Pseudo-philosophies become even more dangerous when they begin to incorporate religious elements and present themselves as a synthesis of science and religion, or of religion based on scientific facts, which in reality are no more than hypotheses supported by a particular philosophical attitude. The case of Teilhard de Chardin, the most recent adventure of this kind, is a perfect example of pseudo-metaphysics tied to the theory of evolution, and stands at the very antipodes and is the antithesis of the spiritual vision of nature which is an integral part of true metaphysics.

What is desperately needed in biology, as in physics, is a philosophy of nature which again cannot be abstracted from biology itself and even less from physics. The debate between teleology and mechanism reflects so clearly an inert view of nature drawn from physics forced upon the sciences of life. For this reason many outstanding biologists have rebelled against the mechanistic thesis and asserted the importance of teleology in all life processes.[15] In other questions of biology difficulties are also encountered because the philosophical assumptions are those of a world seen through the eyes of physics. There has been as yet no philosophy of biology which does justice to the subject of this science even less than that found in the case of physics.[16] And in biology, even more than in the sciences dealing with quantity, there is a need for a vision of reality in which qualities and forms of life have an ontological rather than an accidental status. Such vision can only find its justification within that ultimate science of reality that is metaphysics.

Metaphysical doctrines can also assist in the elimination of false implications in biological theories, especially those of the theory of evolution. Throughout the world today particularly

15 Such an outstanding biologist as D'Arcy Thomson is an example.

16 On the problems concerned with the philosophy of biology see E. W. F. Tomlin, *Living and Knowing*, London, 1955, parts two and three.

in the Orient where there are still societies that remain faithful to their religious principles and the social structure based upon them, men are asked to evolve and change simply because evolution is in the nature of things and is inevitable. A more objective assessment of the findings of biology would insist that as long as man has been living on earth he has not evolved at all; nor has his natural environment changed in any way. The same plants and animals are still born, grow, wither and die and regenerate themselves except for the unfortunate species that modern man who believes himself to belong to the process of evolution has made extinct. In fact it could be asserted that although the rise, change, and decay of human societies is an inevitable truth the one factor that has not evolved throughout this process is nature itself. The so-called progressive evolution of mankind, far from being the inevitable consequence of cosmic and natural processes, is completely opposed to the immediate and contemporary life of the natural environment in which man lives, an environment whose movement is cyclic rather than evolutionary and which through cyclic change reproduces the same permanent forms.[17] Perhaps one of the reasons why modern man who believes in progress and evolution has come to a severe crisis in his encounter with nature is that his evolutionary beliefs with all that these beliefs imply religiously, politically, socially and economically do not conform to the life in that domain of reality that surrounds him but which he has not made, namely virgin nature and all the forms of life flourishing in its bosom.

[17] This assertion is not meant in any way to be opposed to the gradual solidification and coagulation of the cosmic ambiance asserted by traditional doctrines, especially the Hindu doctrines of cosmic cycles.

3

Part One of Essay Three is an extract of Chapter 1 of Martin Ling's book entitled *Ancient Beliefs and Modern Superstitions*, Perennial Books, London (1965), pp. 4 – 7, while Part Two represents Ling's review of *The Transformist Illusion* by Douglas Dewar (Dehoff Publications, Murfreesboro, Tennesse), one of the few rare books written by a scientist critical of the theory of evolution and often quoted by Lings in this essay. This review has been included as Appendix I in the second edition of *Ancient Beliefs and Modern Superstitions* (1980), pp. 77 – 81 for the benefits of those who might like to have more information about critiques of evolutionism presented by a scientist himself. Martin Lings, whose Muslim name is Abu Bakar Siraj Ed-Din, is a well-known English scholar.

He was born in Burnage, Lancashire, in 1909. After taking an English degree in 1932 at Oxford he was appointed Lecturer in Anglo-Saxon at the University of Kaunas in Lithuania. But his interest in Sufism and in Arabic took him to Egypt in 1939, and in the following year he was given a lectureship at Cairo University. In 1952 he returned to England and took a degree in Arabic at London University. In 1970 he became Keeper of Oriental Manuscripts and Printed Books at the British Museum (in 1973 his department became part of the British Library) and held the post for many years.

Martin Ling's writings include *The Book of Certainty (The Sufi Doctrine of Faith, Vision, and Gnosis), A Sufi Saint of the Twentieth Century, Shakespeare in the Light of Sacred Art, What is Sufism, The Quranic Art of Calligraphy and Illumination, and Muhammad.*

Essay Three

Part One

Science Knows Nothing About The Origin Of Man

By Martin Lings

Must science, in order to be true to itself, maintain the theory of evolution?

In answer to this question let us quote the French geologist Paul Lemoine, editor of Volume V (on "Living Organisms") of the *Encyclopedie Francaise*, who went so far as to write in his summing up of the articles of the various contributors:

"This exposition shows that the theory of evolution is impossible. In reality, despite appearances, no one any longer believes in it ... Evolution is a sort of dogma whose priests no longer believe in it, though they uphold it for the sake of their flock."

Though undeniably exaggerated in its manner of expression — that is, as regards its sweeping implications, of hypocrisy on the part of the "priests" in question — this judgement, coming where it does, is significant in more than one respect. There is no doubt that many scientists have transferred their religious instincts from religion to evolutionism, with the result that their attitude towards evolution is sectarian rather than scientific. The French biologist Professor Louis Bounoure quotes Yves Delage, a former Sorbonne Professor of Zoology: "I readily admit that no species has ever been known to engender another, and that there is no absolutely definite evidence that such a thing has ever taken

place. None the less, I believe evolution to be just as certain as if it had been objectively proved." Bounoure comments: "In short, what science asks of us here is an act of faith, and it is in fact under the guise of a sort of revealed truth that the idea of evolution is generally put forward."[1] He quotes, however, from a present day Sorbonne Professor of Palaeontology, Jean Piveteau, the admission that the science of facts as regards evolution "cannot accept any of the different theories which seek to explain evolution. It even finds itself in opposition with each one of these theories. There is something here which is both disappointing and disquieting."[2]

Darwin's theory owed its success mainly to a widespread conviction that the nineteenth-century European represented the highest human possibility yet reached. This conviction was like a special receptacle made in advance for the theory of man's sub-human ancestry, a theory which was hailed without question by humanists as a scientific corroboration of their belief in "progress". It was in vain that a staunch minority of scientists, during the last hundred years, presistently maintained that the theory of evolution has no scientific basis and that it runs contrary to many known facts, and it was in vain that they pleaded for a more rigorously scientific attitude towards the whole question. To criticize evolutionism, however soundly, was about as effective as trying to stem a tidal wave. But the wave now shows some signs of having spent itself, and more and more scientists are re-examining this theory objectively, with the result that not a few of those who were once evolutionists have now rejected it altogether. One of these is the already quoted Bounoure; another, Douglas Dewar, writes:

"It is high time that biologists and geologists came into line

[1] *Le Monde et la Vie*, November 1963.
[2] *Le Monde et la Vie*, March 1964.

with astronomers, physicists and chemists and admitted that the world and the universe are utterly mysterious and all attempts to explain them [by scientific research] have been baffled";[3] and having divided evolutionists into ten main groups (with some subdivisions) according to their various opinions as to what animal formed the last link in the chain of man's supposedly "pre-human" ancestry, opinions which are all purely conjectural[4] and mutually contradictory, he says:

"In 1921 Reinke wrote: 'The only statement, consistent with her dignity, that science can make [with regard to this question] is to say that she knows nothing about the origin of man. Today this statement is as true as it was when Reinke made it.'[5]

If science knows nothing about the origins of man, she knows much about his prehistoric past. But this knowledge would have taught our ancestors little or nothing that they did not already know, except as regards chronology, nor would it have caused any general change in their attitude. For in looking back to the past, they did not look back to a complex civilization but to small village settlements with a minimum of social organization; and beyond these they looked back to men who lived without houses, in entirely natural surroundings, without books, without agriculture, and in the beginning even without clothes. It would be true then to say that the ancient conception of early man, based on sacred scriptures and on age-old traditional lore handed down by word of mouth from the remote past, was scarcely different, as regards the bare

[3] D. Dewar, *The Transformist Illusion*, Dehoff Publications, Tennessee, 1965 (English agent: "Santhia", Stoke, Hayling Island). See *Preface*.
[4] Because "no evolutionist who values his reputation will name *any known fossil* and say that, while not human, it is an ancestor of *Homo sapiens*" *Ibid*, p. 114.
[5] *Ibid* p. 294.

facts of material existence, from the modern scientific conception,[6] which differs from the traditional one chiefly because it weighs up the same set of facts differently. What has changed is not so much knowledge of facts as the sense of values.

6 This word means what it says and is used here: (a) To exclude the Neanderthaloid features which in the illustrations to so many primary school text books and others are usually attributed to our remote ancestors. "Since modern man appeared long before the Neanderthal type, and the earliest Neanderthal remains are most like the modern type, it seems obvious that the Neanderthal type was a degraded one ... In no way could be serve as our ancestor. (L.M. Davies, "Science and Pseudo-Science," in *The Nineteenth Century and After*, Vol. CXLI, p. 110;) (b)To include certain evidence which is all too often passed over in silence, evidence such as that of the Castenedolo and Calaveras skulls, which point to the existence on earth of "men of modern type" at a period when, according to the theories of the evolutionists, *Homo sapiens* had not yet evolved. For details of the above-mentioned and others of the earliest known fossils of man, see Dewar, *ibid*, pp. 117-29.

Part Two

The Transformist Illusion – A Review

The author treats his subject from many different angles – physical, geological, palaeontological, geographical and biological, his method being always to present us with the facts and to draw a sharp line of demarcation between fact and theory – a line which evolutionists have done all they can to blur. Particularly significant in this aspect is a chapter on "Alleged Fossil Links between Man and Non-Human Ancestors", which makes it clear that there exist fossils of men of modern type which are far older than those of "Pekinman" and other supposed "missing links".

Equally instructive in its own way is the chapter which follows this, "Transformism versus the Geological Record". The geological evidence is hostile to the theory of evolution while at the same time it in no sense contradicts the religious doctrine of sudden creation for, as Dewar has pointed out in an earlier chapter, "the abruptness with which new Classes and Orders of animals make their first appearance in the rocks known to us is one of the most striking features of the geological record". Unable to turn an altogether blind eye to this, some of the more objective evolutionists have sought to save evolutionism and at the same time to avoid having recourse to a Divine Creator, by endowing nature herself with powers of sudden creation which are termed "explosive evolution" (Schindewolf) or *aramorphosis* (Severtzoff and Zeuner). Such theories have the added convenience of absolving the evolutionist from the need to produce missing links.

"Schindewolf...asserts that it is useless to look for missing links in many cases, because the supposed links never existed. The first bird hatched from a reptilian egg."

No less miraculous, however, are the gradual changes imagined to have taken place by the "non-explosive" evolutionists, whose texts continually rely, not without success, on the ignorance of the layman or on his lack of observance. Dewar gives many outrageous examples of such exploitation, from amongst which we may quote Darwin's remark: "With some savages the foot has not altogether lost its prehensile power, as is shown by their manner of climbing trees and of using them in other ways", and since a point of central significance is touched on here, we should be justified in dwelling on it for a moment attentively – more attentively than Darwin would have wished, for he must have been well aware of the following facts. Any normal human being can develop with practice, if driven by circumstances, certain powers of grasping with the feet. But such development can be only within very narrow limits, for organically the human foot, unlike the human hand, is not made for grasping. It is made to serve as a basis for man's upright posture and gait, whereas the foot of an ape is organically as prehensile as a hand. In the human foot the transverse ligament binds together all five toes, whereas in the ape it leaves the big toe free like a thumb. Now let any reader look at his own hand, which in the above respect is similar to the foot of an ape, and ask himself whether it is imaginable that even in millions of millions of years the ligament that binds together the four fingers could ever come to throw out a kind of noose, lassoo the thumb, and bind it up together with the fingers, all this, presumably, taking place under the skin. When Darwin says "the foot has not altogether lost its prehensile power" does he mean "the lassooing has already taken place but the roping in has not quite been effected"? But he relies on such questions not being asked.

Another way of taking advantage of the layman is through terminology, and in this connection Dewar fully confirms a suspicion that some of us have already had, the suspicion that under cover of technical terms scientists sometimes talk or write nonsense with impunity. A case in point, given in the chapter on "Some Transformations Postulated by the Doctrine of Evolution", is an account by Dr R. Broom, an authority on the fossils of the South African mammal-like reptiles, of how he supposes the mammals to have evolved from the Ictidosaurians. In Broom's own language the account sounds quite impressive though it is more or less unintelligible to the layman. Translated by Dewar into plain English, it reads:

"Some reptile scrapped the original hinge of its lower jaw and replaced it with a new one attached to another part of the skull. Then five of the bones on each side of the lower jaw broke away from the biggest bone. The jaw bone to which the hinge was originally attached, after being set free, forced its way into the middle part of the ear, dragging with it three of the lower jaw bones, which, with the quadrate and the reptilian middle-ear bone, formed themselves into a completely new outfit. While all this was going on, the Organ of Corti, peculiar to mammals and their essential organ of hearing, developed in the middle ear. Dr Broom does not suggest how this organ arose, nor describe its gradual development. Nor does he say how the incipient mammals contrived to eat while the jaw was being rehinged, or to hear while the middle and inner ears were being reconstructed!"

Broom's hypothesis is not just an exceptional freakish vagary, but a typical example of the sort of transformation that the evolutionist assumes to have been repeated again and again all along the line of any existing animal's evolution from the first "one-celled" ancestor. What is exceptional in Broom's case, is that unlike most others he does at least try to explain how the supposed transformation might have occurred. Dewar com-

ments, not without justice:

"One reason why the evolution theory was so readily accepted was the belief that, while the theory of special creation involves the miraculous, that of evolution does not. One of the aims of the present book is to demonstrate that the theory of evolution, far from dispensing with miracles, involves more than does the theory of creation." Meantime, most people are altogether ignorant of this and other equally significant facts that *The Transformist Illusion* lays bare. One result of this ignorance is the flood of books by non-scientists about the history of mankind, books for adults and books for children, which take evolution altogether for granted, as a truth that no reasonable man would call in question, and which pour out, year after year, doing untold harm; and not the least harmful of these books are those by believers on the brink of unbelief, some of them religious dignitaries, who seek to stabilize thier own and others' tottering faith by a reinterpretation of religion in conformity with "the light of modern scientific knowledge".

Looking at the question from a different angle, one which is more in the spirit of the book to which this appendix has been added, it must be remembered that only by escaping from time can man escape from the phases of time. The spiritual path excapes from these phases because only its starting point lies altogether within time. From there onward it is a "vertical" upward movement through domains which are partly or wholly supratemporal as represented in Dante's *Purgatorio* and *Paradiso*. But modern science does not know of any such movement, nor is it prepared to admit the possibility of an escape from the temporal condition. The gradual ascent of no return that is envisaged by evolutionism is an idea that has been surreptitiously borrowed from religion and naively transferred from the supratemporal 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. Every process of development known to modern science is subject to a waxing and waning analogous to the phases of the moon, the seasons of the year, and the different periods of man's life. Even civilizations, as history can testify, have their dawn, their noon, their late afternoon and their twilight. If the evolutionist outlook, instead of being sectarian and pseudo-religious, were genuinely "scientific" in the modern sense, it would be assumed that the evolution of the human race was a phase of waxing that would necessarily be followed by the complementary waning phase of devolution; and the question of whether or not man was already on the downward phase would be a major feature of evolutionist literature. But the question is never put. Nor can there be any doubt that if evolutionists could be made to face up to it, most of them would drop their theory as one drops a hot coal.

There could be no question of any such evolution from the standpoint of ancient natural science, which did not claim to have everything within its scope, that is, within the temporal domain, and could therefore admit to being transcended by the origins of earthly things. For those origins, it looked beyond temporal duration to the Divine creative act which places man (and the whole earthly state) on a summit from which evolution, in the sense of terrestrial progress, is inconceivable.

Plate 3. Various species of brown seaweed (algae)

"God is beautiful and loves beauty."
(Ḥadīth)

4

Essay Four is written by R.M. Morrell, a well-known Australian Scientist, who is an authority on fossils. Entitled *Evolutionary Contradictions and Geological Facts*, it first appeared in the November 1974 issue of Australian News Gazette. This article was also published in *The Criterion*, Vol. 10, Nos. 5 & 6, Journal of the Islamic Academy, Pakistan, 10/C/163, Federal 'B' Area, Karachi – 38, pp. 29 – 35.

Essay Four

Evolutionary Contradictions and Geological Facts

By R.M. Morrell

Addressing a conference of American biology teachers, Professor John Moore of the Department of Natural Science of Michigan State University stated: 'There is nothing but circumstantial evidence to support the theory of evolution.' This claim contrasts with the assertion made by the British zoologist, Sir Julian Huxley in the *Encyclopedia Britannica*, that there is 'not the least doubt as to the fact of evolution ...' Huxley may well like to think that evolution is an established fact. However, there is a growing volume of support in scientific circles for Professor Moore's standpoint rather than for Sir Julian's self-confident claim. A distinguished British scientist, Professor G. A. Kerkut of Southampton University's Department of Physiology and Biochemistry, has publicly stated that the evidence for evolution is of such a character that the theory can only be viewed as 'a working hypothesis' (*Implications of Evolution*, 1972, p. 157).

The primary importance of palaeontology in respect of the theory of evolution was recognised by Darwin in his *Origin of Species*. He knew that the fossil record did not support his speculations, but he was confident that subsequent research would fill the gaps. Since Darwin first expressed his hopes in 1859 geologists have laboured to fulfil his expectation. Their efforts, however, have been a case of labour in vain, for the hoped-for evidence has not turned up. In his contribution to *Darwin's Biological Work*, a book published by Cambridge

University Press in 1959 to celebrate the anniversary of the publication of *Origin of Species*, a distinguished geologist, John Challinor, late of the University College of Wales, admits that the fossil record only 'partly supports evolution', but it also supports 'separate and independent creation'. He asks the question: 'Is there any positive proof, from any part of the evidence, that evolution has, or has not, occurred?', and answers it negatively ('Palaeontology and Evolution' from *Darwin's Biological Work*, 1959; republished 1970, p. 53). Here, then, we have a professional geologist clearly stating that the fossil record does not demonstrate evolution and in actual fact can be used to demonstrate creation. Dr. Challinor, though, is an evolutionist, despite what his research has revealed, but, aware of the significance of his admissions, goes on to speak of 'near proof' being obtained 'in some cases'. This suggests that we are justified in assuming that most probably it is universal and we must try to explain the general paucity of evidence as best we may'. He then adds, 'someone seriously combating the whole idea of evolution might well ask, in some exasperation, what evidence against evolution the evolutionary palaeontologist could not explain away to his own satisfaction'. In short, Dr. Challinor tells us rather bluntly that evolutionary palaeontologists argue around difficulties rather than answer them.

It is a basic evolutionary postulate that continuity exists at all taxonomic levels, and in a review of the palaeontological evidence advanced for evolution, the British palaeontologist, Professor F. H. T. Rhodes, now of the University of Michigan, confidently asserts that it does and can be demonstrated. However, almost immediately after making the claim, he qualifies it by adding the words 'only in a limited number of cases'. ['The Course of Evolution', *Proc. Geol. Ass.* 77: 1 (1966), p. 16]. Presumably, Professor Rhodes hoped that nobody would note the fact that he had contradicted himself;

for either continuity did exist and was demonstrable, or it did not. As a palaeontologist he is well aware that the chain of continuity, for which he argues, is broken almost at the start with a gap between Precambrian and the Cambrian.

An examination of the standard manual on fossil identification, (British Museum, Natural History, *British Palaeozoic Fossils*), will show it does not describe or illustrate any Precambrian species, despite the fact that the era has strata ideal for the preservation of the remains of past life. This lack of fossils from the Precambrian has produced a crop of theories in explanation, and while they make for interesting, or entertaining, reading, they shed little if any light upon the problem. Rhodes admits that the Cambrian abounds in fossils, stating it to have over 900 species representative of nine phyla. Many of these species are both complex and highly specialized and demand an evolutionary history if the theory is to get off the ground. However neither Rhodes nor anyone else has provided them with one based upon hard facts.

The question of the boundary between the Cambrian and the Precambrian is itself of some interest, and has a direct bearing upon the claims made for some recent discoveries in Australia which have been placed in the late Precambrian. On an international basis, the boundary between the Precambrian and Cambrian is distinguished in terms of a discontinuity. Where found, it is argued that the strata above is Cambrian and that below Precambrian. This discontinuity is not present in Britain, and even where it is present in other countries (and it is not always easy to see, or see at all) the actual rocks can tell us nothing about the supposed age difference between the two systems. Thus it can be argued that if a discontinuity can be observed, it simply represents a violent upheaval of short duration, certainly not one of a duration long enough to account for evolutionary change. There is in fact considerable difficulty in determining what is and what is not Precambrian

and Cambrian, for comparison of rock samples can demonstrate nothing positive other than their composition. Challinor, in the work already cited, brings this out when he states that 'when strata with a Lower Cambrian fauna are conformably underlain by a great thickness of unfossiliferous strata it must be somewhat uncertain whether these lower strata, particularly the lowest of them, should be classed as Cambrian or Pre-Cambrian' (p. 70).

Rhodes himself notes that the method of deciding what belongs to what, is quite arbitrary. 'The base of the Cambrian' he writes, 'is not always a precise stratigraphic horizon. Stratigraphic correlation *is almost always a matter of faith* (my emphasis), done entirely on an intercontinental scale by matching similar faunas. In the case of the lowest Cambrian there is a distinct possibility that our correlation may be tenuous.' This means, in short, that fossil material claimed as Precambrian could just as well be ascribed to the Cambrian, and thus the break in continuity becomes not simply a gap but a yawning chasm.

This brings us to the Australian fossils already mentioned. They were discovered at Ediacara in South Australia, and have been hailed as being one of the most important discoveries of Precambrian material yet made. Personal examination of some of these fossils gave me the impression that an inorganic explanation can be advanced for several. However, it is clear that a great deal of the material is undoubtedly the remains of long dead creatures. Without exception all are complex, thus posing considerable problems for evolutionists. In appearance they are related to creatures found in formations dated by geologists much younger than the Cambrian, and so it is not without significance when we learn that initially they were ascribed to the Cambrian and not the Precambrian. They were dropped into the late Precambrian out of stratigraphic considerations, which, as we

have seen, both Challinor and Rhodes have pointed out, is a process that abounds in uncertainty and doubt. Thus we have fossils claimed as being Precambrian, but which, as everyone well knows, could well be early, middle, or even late Cambrian.

Transitional links are essential to the theory of evolution, for making the continuity Rhodes claims. In his paper he asserts that transitional forms exist to link amphibians with reptiles, and reptiles with mammals. The link claimed between amphibians and reptiles is to be found, according to Rhodes, among the Seymouriamorphs, *Seymouria* itself displaying both amphibian and reptilian characteristics. But is Rhodes correct in his contention? In a work published only a few weeks before the Rhodes paper, W.E. Swinton, the international authority on fossil reptiles, flatly contradicts Rhodes, and denies that *Seymouria* can be a transitional form. He states that the degree of specialization displayed by it precludes *Seymouria* from the immediate line of reptilian ancestry [*Fossil Amphibians and Reptiles* (1965), pp. 25-27]. Swinton also points out that *Seymouria's* systematic position is open to question.

The transitional form between reptiles and the mammals is to be found, according to Rhodes, among the therapsids. Swinton does not agree, maintaining that all they do is to indicate the lines along which evolution took place. Rhodes omits any discussion of the difficulties involved in his claim; for example, how the reptilian jaw, which differs from that of a mammal in the number of bones present and the articulation with the skull, could have evolved without the transitional forms dying out through their inability to eat; or how the highly complex organ in the ears of mammals, termed the corti, which is completely lacking in reptiles, could have evolved, and from what. Any creatures undergoing the changes involved in the evolutionary formation of such structures as the cor-

ti, or major anatomical variation in their jaw structure, would become extinct, because they could not have survived over the period demanded by evolutionists for such changes to have taken place. The late Sir Gavin de Beer recognized difficulties involved in postulating mammalian evolution and hinted strongly that the essential transitional forms demanded by the theory of evolution will never be forthcoming, when he wrote that 'fossils which might be regarded as ancestral to the existing mammals have not yet been found'. [*Advancement of Science*, 11: 42 (1954), p. 167]. The American authority on dinosaurs, Professor E. H. Colbert, refers to the fact that 'we can obtain no direct evidence on these changes (the establishment of constant body temperature, insulating coat of hair, reproductive organs, etc.) ...' (*Scientific American Reprint*, 'The Ancestors of Mammals', March, 1949, p. 4). One assumes that Rhodes is aware of such difficulties, and so must know that, without the required evidence, his claims amount to wishful thinking as distinct from hard scientific fact.

The great bulk of the fossil evidence advanced for evolution consists of examples of structural difference. Thus fossil sea urchins are said to display evidence for evolution on the basis of changes seen in specimens collected in sequence. Changes in structure (body size, shape and size of beaks) is advanced as evidence of evolution among finches on the Galagapos Islands, and in a recent paper entitled 'Divergence and Evolution in Darwin's Finches' [*Bio J. Linn. Soc.*, vol. 5 (1973), pp. 289-295], Messrs. Ford, Parkin and Ewing present material on the differences displayed by various finches, and the advantages given to some by the shape of their beaks. Yet such differences are not, as the authors assume, evidence for evolution any more than are the reasons why they came about. Thus when they write of such differentiation as illustrating 'the importance of these finches in the development of our knowledge on evolution' (p. 295), they simply display on their own part a

confusion between evolution and development within the species. For, after all, the finches remain finches in the same manner that differentiation in the sea urchins still leaves them as echinoderms.

I commenced with the observations of Dr. John Challinor expressed in a volume eulogistic of Darwin. His conclusion as to what evidence the various fossil groups display for the theory of evolution, contrast markedly with the assertions of Professor Rhodes, and are certainly deserving of careful consideration. He states:-

Foraminifera: As the evidence stands, the morphological series shown do not always seem to have very strong claims to being evolutionary series' (p. 79).

Anthozoa: 'Any suggestion is welcome in the attempt to find some evolutionary scheme into which the corals may be fitted' (p. 80).

Echinoidea: 'Their number (the unanswered questions) is a measure of our ignorance' (Challinor is quoting another writer) (p. 81).

Brachiopoda: 'Such is the imperfection of the geological record of evolution' (p. 82).

Mollusca: 'No very coherent picture emerges when we trace the lammelibranchs and gastropods through the stratigraphical systems' (p. 82).

Trilobita: 'The Cambrian record ... reveals very little of the evolutionary paths they followed' (p. 86).

Graptolithina: 'The links in the supposed evolutionary chains are not so secure as was thought' (p. 87).

Vertebrates: 'The origin of the vertebrates is no more clearly revealed than the origin of any other phylum ...' 'The frailty of the palaeontological evidence' (pp. 88 & 89).

Plants: '... meagre evidence ...' (p. 89).

In the light of such conclusions, the self-confident claims by

Huxley and others of 'the fact of evolution', take on a rather hollow ring. Yet, when we are regaled in the press or over TV and radio concerning evolution, the weakness of the case for it, as revealed by the quotations given above (which are just a few), is never mentioned. Yet the facts are there for all to see, and indicate that due consideration should be given to alternative ideas; and scientists, such as Professor Rhodes, who object to this, appear to be more concerned with upholding a particular dogma than seeking for the truth.

5

Essay Five entitled *Reactions to the Theory of Evolution* is an article by *Michael Negus* which appeared in the quarterly journal, *Studies in Comparative Religion,* Summer-Autumn 1978 issue, Vol. 12, Nos. 3 & 4, pp. 188 – 194. This journal, published by Perennial Books Ltd., Middlesex, England, is devoted to the exposition of the teachings, spiritual methods, symbolism and other facets of the great religious traditions of the world.

Michael Negus who is a lecturer in Birmingham has contributed his articles regularly to this journal.

Essay Five

Reactions to the Theory of Evolution

By Michael Negus

The word evolution literally means the unfolding or unrolling of potential. However, since the appearance of Charles Darwin's Theory of the Origin of Species in the nineteenth century, it has come to refer to the hypothetical process by which all forms of life are assumed to have arisen from inorganic matter. Simple organic beings are said to have arisen from inorganic molecules, after which, by a process of genetical mutation and natural selection, the whole of the plant and animal kingdoms have been derived. The two eventual implications of this theory are atheism and a general belief that change may be equated with improvement.

When Darwin's theory became public there was an immediate religious reaction against it which continues to some extent today. However, more and more Christians have come to accept the theory, usually by insisting that evolution must have been guided by God. The works of Teilhard de Chardin have played a considerable role in encouraging this belief. The measure of their success can be seen by the influence of evolutionary thought on the Second Vatican Council, both in some of the Council's documents and in the liturgical changes which followed.

Why should the Theory of Evolution be so convincing? Is it a matter of concrete evidence or interpretation? To answer these questions we might begin by taking two examples to show how the same facts are interpreted from evolutionary

and traditional points of view.

1. The skeletons of different vertebrates have a striking similarity. If one takes for example the limbs or skulls of a number of different vertebrate classes it is possible to find clear homologies between bones and to relate the differences in shape and proportion to the overall function of the organ. To the traditional mind this is evidence for a unity which transcends the differences between vertebrates and has its origin firstly in the Divine Unity and secondly in the unity of the Divine Idea which determines vertebrate existence. To the evolutionist, however, the same facts are evidence of common ancestry; that all vertebrates have a single pre-vertebrate origin and therefore need no Creator.[1]

2. The geological record indicates that there were vast periods of time before the appearance of man. How may this be explained from a traditional point of view? According to the Sufi Muhyiddin Ibn 'Arabi: "Adam is the unique spirit (*al-nafs al-wahidah*) from which was created the human species", the latter being the outward, individual manifestation of the former.[2] Adam or Universal Man (in Sufism: *al-insan al-kamil*) is the single principle of every cycle of existence, whether this is the Age of Reptiles or the Age of Man. The manifestation of individual man is the necessary and ultimate consequence of Universal Man and this is why man occupies a central position amongst all the creatures.[3] The evolutionist, ironically because of his Christian heritage, finds a world without men more or less equivalent to a world without God. He sees no reason why God should create such a

[1] It is perhaps worth mentioning that in recent years the same comparative method has been applied by evolutionists to the structure of some biological molecules such as enzymes. Exactly the same criticism applies to their conclusions. Old habits die hard.

[2] See Ibn 'Arabi, *The Wisdom of the Prophets*, trans. T. Burckhardt, Beshara Publications, 1975; Chapter entitled 'The Word of Adam'.

[3] See Rene Guenon, *Symbolism of the Cross*, Luzac & Co., London (1958), Chapter 2.

world and so eventually concludes that God did not.

The Theory of Evolution ties together information from the fossil record and from observable genetical mutation and natural selection. The latter information is far from new to mankind. Agriculturists have known for millenia that variation and selection can sometimes give rise to 'high-yield' varieties of animals and plants. Darwin's innovation was to find examples of this in nature, to extrapolate his discovery to indefinite limits, and to reject the fundamentalist interpretation of Creation prevalent at the time. In fact Darwin replaced one error with another. Given a choice however, one must insist that the first error is preferable to the second; this error, as such, only concerns Existence, not the Cause.

Fossil records may be adequately explained in terms of metaphysical, cosmological and alchemical principles. The sequence of vertebrate fossils in the Paleozoic and Mesozoic periods, for example, from the lowest, oldest rocks upwards, are arranged like images in a medieval alchemical diagram. The ascent through the strata is clearly one from obscurity to spiritual liberation; from amphibia and early reptiles related to the crocodile, through an extraordinary variety of reptilian forms, until eventually bird fossils appear. This vast creative cycle prefigures on a grand, cosmic scale the science of Alchemy. The following quotations from Titus Burckhardt concerning Alchemy are strikingly like a commentary on the Paleozoic and Mesozoic fossils: "The dragon alone can represent all phases of the work, depending on whether it is provided with feet, fins or wings, or is without any limbs whatsoever". "The alchemical symbol of the dragon thus closely resembles that of the Far Eastern World Dragon, which first lives as a fish in water, and then, as a winged creature, soars into the heavens".[4] The sequence of fossilized beings, found in

[4] Burckhardt, T., *Alchemy, Science of the Cosmos, Science of the Soul*, trans. W. Stoddart, Stuart and Watkins, London (1967), p. 138.

rocks, corresponds to the expression in time of a 'pattern'[5] which exists in simultaneity outside time and which has manifested itself both macrocosmically and microcosmically.

A comparative study of fossil and living creatures indicates some sort of compromise between the creative forces causing multiplicity and the restrictions demanded by the need for equilibrium in the cosmos. Commonly groups of organisms show greatest diversity shortly after the time of their appearance. During the course of time there is usually a restriction in diversity brought about by selective extinction. Those types survive which have a niche in the integrated cosmos.

The Divine 'need' to manifest every possibility means that the clear cut differences we see between modern groups of organisms are often less distinct in the fossil types. When evolutionists refer to "intermediate" organisms they do so with hindsight and, without knowing it, compare what is eventually possible in the cosmos with what was necessary at the times of creation.[6]

The most incongruous characteristic of the Theory of Evolution is the lack of concrete evidence for it. The lack of evidence is certainly not due to the uninterest of evolutionists, some of whom, starting in the 1930's, have attempted in vain

[5] The reptilian cycle, corresponding roughly to the period from the Silurian to the Cretaceous, is dominated by the vertical dimension, an ascent from *tamas* (fish-amphibia) to *sattva* (birds). The mammalian cycle (Cainozoic) which follows afterwards is characterized by the horizontal dimension, in which man, the final creation, occupies the central point; the tendency is centripetal rather than ascending. The cruciform pattern which unites the two cycles demands both creative and destructive phases as one superimposes upon the other.

[6] Palaeontologists are frequently reported in the press as having discovered yet more ancient fossil fragments of creatures "belonging to the human line of descent". In fact these fossil "hominids", of which there is some variety, do occupy a cosmic position between apes and men but in a hierarchic rather than a phyletic sense. It is known that these creatures had some skills in toolmaking, *etc.*, but there is absolute difference between hominid cerebral ability and the transcendent consciousness which is the primary characteristic of man.

to produce a new species experimentally by induced mutation. The Theory survives because the imagination of modern man readily transforms one animal form into another. This is so because the modern psyche is dominated by time, matter and change and is relatively blind to space, Substance and Eternity. To oppose one's thoughts to the Theory of Evolution is to think in a way which is contrary to the common tendency of the modern psyche.

Some biologists search for detailed evidence to support the Theory of Evolution by studying living populations and by genetical experiments. They, like Darwin before them, find clear evidence of genetical variation and natural selection. The function of natural selection is principally to maintain the 'norm'. That is to say the types of organisms that are optimal for the niches offered within an integrated community. Evidence for variation and selection causing change has also been found. The examples illustrate how organisms may respond positively to changes in environment. There are also examples of "geographical isolation" where a single breeding population of organisms may become divided into two or more isolated sub-populations. Given time the sub-population may undergo changes which may include a reduction in their abilities to interbreed. These facts amongst others (e.g. polyploidy, hybridization *etc.*) are extrapolated to indefinite limits and are taken as evidence of speciation and therefore evolution.

The traditionalist has no argument with the evolutionist so far as these facts are concerned. The evolutionist uses them as evidence for the Theory of Evolution; the traditionalist interprets them as illustrating the flexibility of a species, the means by which organisms are capable of optimal integration with one another and with their environment. To some extent the evolutionist would agree. However, in one respect the two points of view are completely opposed: the traditionalist

regards change as implying some kind of loss, even though adaptive, whereas the evolutionist regards change as implying, in principle at least, some kind of progress.[7]

The firm conviction of materialists that living organisms arose sequentially from inorganic molecules, leads them to believe that it is possible both to postulate how it could have happened and to eventually devise a technique which would achieve it. The problem for a materialist is to construct an orderly system from disordered molecules without the use of a pre-existing parent system. He is unable to accept any alternative; his interpretation of an organism is in terms of how it has arisen, not how it maintains itself.

To the objection that the greater cannot proceed from the lesser, the evolutionist might reply that the terms greater and lesser are meaningless from his point of view. However, the objection can be phrased in a different way, using the mathematical notion of information.[8] One can say that a living organism has a vastly greater quantity of information than non-living matter. It is also clear that all living organisms either conserve information or lose it. If the energy supply to living cells is interrupted, sooner or later (dependent upon temperature) the living system begins to break down. This is a spontaneous physical process brought about by the natural, thermodynamic tendency towards an increase in disorder, a loss of information and eventually death. This tendency is formulated in the Second Law of Thermodynamics.

Living cells and organisms maintain themselves by cyclical

[7] A similar point of view characterizes heretical religious movements.

[8] Information may be defined quantitatively by taking into account the amount of disorder which results when a change takes place. This can be measured as the amount of energy which is not available for useful work and which is manifest as an increase in disorder after the change has occurred. If no change in disorder occurs then total information is conserved. The quantity of energy not available for conversion into work is known in physics as entropy.

renewal of their components. The information which a cell possesses derives from the complex relationships between the cytoplasm and the genetical code of the chromosomal material of the nucleus. The information of a whole organism is more difficult to define. However, one can say that the fertilized egg from which the organism develops must contain all the organism's information. This must be in excess of the metabolic requirements of the adult since it includes the information for all the embryonic and adult changes until the point of death. The different states which constitute genetical variation within a species may be regarded as resembling the entities of a complex chemical equilibrium, with the possibility of change from one form to another given sufficient "constraint" (i.e. selective pressure) as the Lechatelier Principle states. Change beyond the limits of equilibrium must lead to a loss of information and a gain in disorder in conformity with the Second Law of Thermodynamics. In biological terms: mutation beyond 'permitted' limits results in death. This is an observable, concrete fact, well known to geneticists.

Within the sphere of agriculture and horticulture, artificially selected organisms have less information than their wild ancestors, since selection for certain characteristics inevitably means loss of others. Indeed, this loss is currently causing much concern to breeders. It is sometimes possible to reintroduce some information into an organism by careful breeding programmes (e.g. for disease resistance) by the use of original or other varieties, but one should carefully distinguish this hybridization of existing information from the creation of new.

The energy consumed by living organisms is not used to increase order, but at the best to maintain it by cellular replication. The truly spontaneous production of information is impossible. Organisms originally created by God maintain themselves materially by making use of the continual

'downhill' flow of energy from the sun. An evolutionist might reply that creation cannot be demonstrated, and with this we have to agree. However, for a believer, phenomena such as the Ascension of Christ and the Assumption of the Virgin confirm the creative process in reverse. Furthermore, it would be possible to construct a complete Theory of Creation which took into account all levels of Existence including the evidence used by the evolutionists, which applies only to the gross (most outward) state of Existence.

As a response to the atheism implicit in the Theory of Evolution several anti-evolutionary groups have arisen. Generally they are protestant, evangelical groups, often including trained scientists of a fundamentalist character, who insist upon the literal interpretation of the Bible. They believe, for example, in the creation of the world in six twenty-four hour periods at a certain date only a few thousand years before Christ. The error of the fundamentalists is that they are unable to see beyond the superficial meaning of the Bible. They are unable to see any reason for the vast antiquity of rocks or the incomprehensible dimensions of space. "The heavens proclaim the glory of God, the firmament shows forth the work of his hands." The glory of God exists because it is true, not because an individual man sees it. The strange chemical worlds of Venus and Jupiter, the colours of a Martian sunset, the desolation of the Moon's surface and the animals of the deep oceans all have a significance for God, whether man experiences them or not. God's mercy to man is that He has placed him in an environment which is immediately comprehensible and efficaceous for salvation, since it conforms to his nature. One can argue that the scientific knowledge which characterizes modern man has in a sense been stolen from God. This is why modern man, having 'fractured' the world's envelope in which he was providentially enclosed, finds himself confronted with an immensity of

knowledge which supersaturates his mind. Though open to exploitation this knowledge also threatens to destroy him.

There is a need to avoid two errors: the first is the error of rejecting adequately established scientific fact, eg. the age of the earth or the space-time dimensions of the universe. This is the trap into which the biblical fundamentalists fall. The second error is that of accepting pseudo-doctrines like evolutionary progress with all its implications and thereby subverting Tradition. This is the trap into which the followers of Teilhard de Chardin fall.

The balance lies firstly in acknowledging the supremacy of traditional doctrine, but also in accepting within self-determined limits those facts which can be demonstrated adequately by scientific enquiry even though they may have little to offer for the spiritual destiny of man.

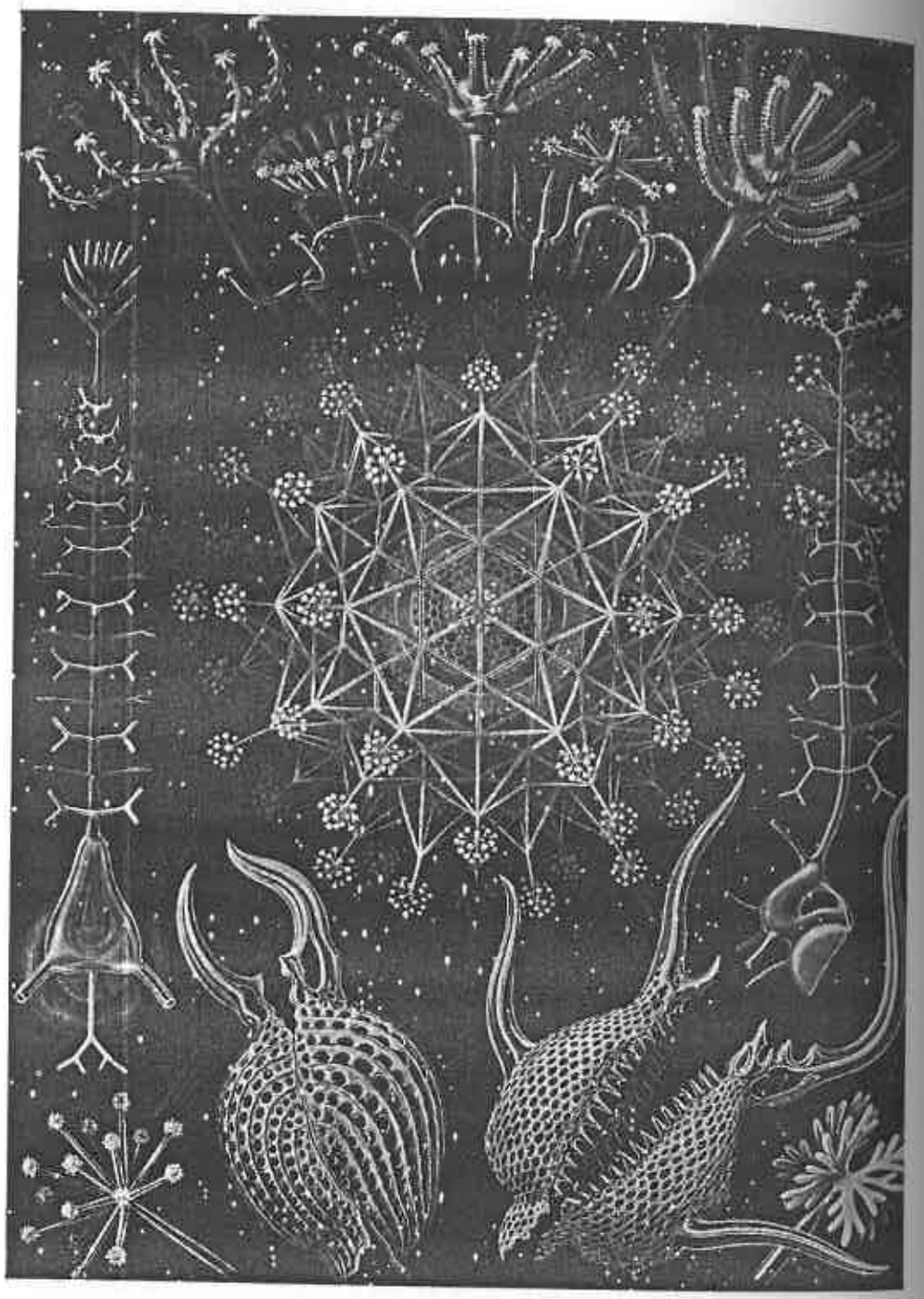

Plate 4. Various species of Radiolaria (a type of marine Protozoa)

"The whole world is composed
in conformity with arithmetical,
geometrical and musical relations."
(Ikhwān al-Safā')

6

Essay Six entitled ***Life as Non-historical Reality*** is written by Giuseppe Sermonti, one of the leading contemporary biologists of Italy. The article first appeared in *RIVISTA DI BIOLOGIA*, 73:4 (1980), pp. 551-569, a quarterly journal on biological sciences, published by the *Instituzione della Rivista di Biologia* of the University of Perugia. Sermonti is the editor of the journal.

Sermonti is currently Professor of Embryology at the University of Perugia. He co-authored with R. Fondi an anti-Darwinian book called *Dopo Darwin, critica all'evoluzionismo.*

Essay Six

Life as Non-Historical Reality

By G. Sermonti

> 22 The Lord passed me in the beginning of his way, before his works of old.
> 23 I was set up from everlasting, from the beginning, or ever the earth was.
> 27 When he prepared the heavens, I was there: when he set a compass upon the face of the depth.
>
> PROVERBS, 8

By *historical* is meant not just any succession of events but a succession of such character that what follows implies (is derived from) what preceds it. Events need not only be serial, but their sequence must be such as to proceed in a single direction, the direction of history. A *catastrophe* is not historical: it is an abrupt occurrence not referable to an immediately preceding cause. The development of the embryo is a historical process, like the life of a man or of a people. The expanding Universe is a historical process (to which a stationary theory was opposed) but the rotation of the Earth and the revolution of the Earth around the Sun are not. It is not possible to distinguish one day from another or one year from another on simply astronomic ground. That which is perfectly cyclic is not historical. Sea waves have no age. Likewise Biblical Wisdom (*Proverbs,* 8.22-27) is not historical; it is permanent and forever. To what extent Life as a general phenomenon may be considered historical is the object of the present article,

although surely its single expressions not only have historical feature but, as birth, development and death symbolize history itself.

The origin of life, the settlement of its biochemical composition or of its genetic structure, the formation of the various *taxa* are by an increasing number of scientists thought to have occurred *very early or very quickly*. In other words their historical process is deferred to the primordial stage and is excluded from recordable time. A *stationary*, balanced, cyclic situation exists thereafter, in which all historical features are lost. This emerging view opposes the evolutionary view according to which Life as a general phenomenon is a progressive process; it is continuously innovated and developed, and its structure is the result of a cumulative trend.

Some aspects of the living world will be discussed in this respect, leading to the eventual conclusion that a stationary (steady-state) view accounts better for the observed facts than an evolutionary (historical) view. The problem of *origins* is outside the domain of our understanding from the scientific point of view.

The constancy of DNA. The amount of DNA per nucleus in different organisms is divided into two orders of magnitude: millions of nucleotide pairs in prokaryotes, and billions of nucleotide pairs in eukaryotes (SPARROW et al., 1972). Intermediate values such as those of some moulds or insects do not figure as transitional. This difference in quantity reflects a profound difference in the DNA organization. The prokaryotic DNA is not protein-bound, exhibits no high repetitivity, does not have spacers between or within the genes (introns) ; all features which are present in the eukaryotic DNA. This structural difference leads to the question of whether the larger amount of DNA per nucleus in eukaryotes corresponds

to an increase in information. In a resent paper by ORGEL and CRICK (1980) the bulk of eukaryotic DNA is considered as junk or garbage. Its presence is attributed to a tendency toward an uncontrolled self-reproduction process, to such an extent that the larger part of DNA is defined as the ultimate parasite. It is present in the cell only because it is not harmful enough to warrant elimination. In a twin paper, DOOLITTLE and SAPIENZA (1980) question the "phenotype paradigm, i.e. the belief that DNA needs a means of expression and consequently a control by the phenotype. In a previous paper, DOOLITTLE (1978) regards the eukaryotic-like DNA as the original primitive from of DNA. It would not have acquired but only "maintained the genetic plasticity present in the gemomes of the ancestor common to all cells."

It is now widely accepted that the amount of DNA in various *taxa* of eukaryotes has no relation to the complexity of their phenotypic organization. Various authors who have collected data on the quantities of DNA per haploid nucleus (e.g. BRITTEN and DAVIDSON, 1971; SPARROW et al., 1972) give for the Echinoderms values from 1 to 2 billions of nucleotide pairs (n.p.), for Anellids, 2.5; for Mollusca from 1.2 to 10; for Bony fishes from 0.35 to 5; for Reptiles from 3 to 6; for Mammals from 3 to 12; for Birds from 1.5 to 3. Values of 100 x 10^9n.p. and more are reported for some Urodels and Dipnoals.

Thus the consideration of the amount of DNA as a direction in the history of Life, which some researchers had enthusiatically accepted is no longer valid. We may conclude : there has not been any *evolution* in the amount of DNA. In this respect, Man (6 x 10^9 n.p.) could just as well have appeared in the *Cambrian* era; together with Mollusca and Protozoa.

The Amount of Genetic Information. The amount of DNA

eventually decoded in an organism can only be evaluated approximately. It can be deduced from the number of proteins which in turn is estimated, conservatively from the number of enzymes or functions. In prokaryotes, if one takes 300 as the average number of amino acid residues for each protein (900 nucleotide pairs) and 10% as the fraction of non-decoded DNA, one can assume that *one gene = c. one thousand nucleotide paris* (WATSON, 1976). By this criterium *Escherichia* coli K 12 would be assigned c. 3,200 genes and about 5,000 genes the average bacterium (SPARROW et al., 1972).

Another estimate of the number of genes, as deduced from the number of functions, was reported for the fruit-fly by JUDD et al. (1972). They have genetically analyzed with extreme accuracy some chromosomal regions in the salivary glands of *Drosophila* arriving at the statement: *one band = one function (one gene).* The total number of bands in *Drosophila melanogaster* is c. 5,000. The estimate of 5,000 genes in an insect was quite surprising. In an organism so morphologiclly complex in comparison to a bacterium, the gene number would appear to be very similar to that of prokaryotes. Thus an insect does not require significantly more functions than a bacterium.

Based on a completely different principle, the number of functions has been estimated in some Amphibia such as *Xenopus* (african toad) and *Triturus* (newt). The evaluation is based on the observation of the number of loops surrounding the lump-brush chromosomes in the oocytes. Observation under electron microscope of RNA produced along a loop provides images similar to the so-called "Christmas tree" observed by MILLER and BAETTY (1969) on bacterial or eukaryotic ribosomal DNA, and corresponding to a single

transcript (gene). The equation *one loop – one gene* appears acceptable. Both *Triturus and Xenopus* (although the first has ten fold the DNA per nucleus than the latter) exhibit 5,000 loops per haploid genome. This number may well be only a rough approximation, and values at variance have been observed in other orders of Amphibia (but on the same order of magnitude). The general impression, however, is that the gene number is essentially unaltered in a bacterium, an insect, or a vertebrate. There are not in fact major differences between molecular types of uni- and multi-cellular organisms (JACOB, 1977).

WADDINGTON and LEWONTIN (1968) have proposed the so-called Serbelloni Theorem which states that "Every tendency to increase the quality of information in the genome will be held under control because the rate of progress under natural selection will be inversely proportional to the number of information units." The maximum number of genes could well have been reached *very early*.

Further studies obviously are required to reach a more reliable estimate of the number of genes in the various *taxa;* but we consider a reasonable hypothesis that such a number is substantially invariant and remains around 5,000. This figure refers only to structural genes, "regulatory" genes being so far undetected in eukaryotes. A similar hypothesis, based on the number of protein species, was put forward by OMODEO (1976). "The cell of a fungus – he wrote – does not contain in all likelihood more protein species than a bacterial cell ... thus a protozoan wouldn't have many more proteins than a fungus. As far as enzymes are concerned, these are produced in even fewer number. The same holds for Metazoa.

The picture emerging from these considerations is that during the terrestrial presence of life there has not been a

progressive modification of the structural material in which the genetic information is memorized or coded, but rather a variation (not necessarily adaptive) in the phenotypes, whose genetic memorization (assimilation) was a secondary effect and, therefore, not a primary cause of variation.

Origin of Biochemical Differentiation. The diversity, unapparent in the number of genes, could be revealed in the quality of the genes, i.e. in their structure and function in the various *taxa*. Study of the primary structure and function of numerous ubiquitary proteins has produced surprising results (MARGOLIASH et al., 1968). This is a well known chapter. It can be summarized by stating that the greater the distance between two species, the higher the number of amino-acidic residuals in cytochrome C by which they differ. This was expected. The astounding part of the story is that the spacial configuration and the function of all cytochromes C so far examined, from man to reptiles, to fishes, to flies, to moulds, all are superimposable. The differences are not *adaptive* and concern regions with no relevance to the function. Natural selection has played a conservative role in maintaining intact that part of the gene corresponding to the aminoacids involved in the function (DICKERSON, 1971). In other words, the diversification among proteins is determined through *neutral* mutations (KIMURA and OHTA, 1971). The same holds for proteins such as fibrinogen, globins, proinsulin, histone IV A. The latter undergoes the substitution of a residual every 200 million years. However, when the gene for histone IV A of two sea-urchins was (partially) decifered, out of 27 third-position nucleotides, as many as 9 were different, and the affected triplets were synonimous. A first-position difference was also synonimous and relative to a six-codon aminoacid (leu) (GRUNSTEIN et al., 1976). This shows that mutation is also

active in the apparently stable genes, and the reduced variability is the result of a strong functional constraint which causes the loss of a large number of mutants. What appears to be clear from this research is the fact that it is not the variation in DNA which has produced the differentiation among *taxa* at the gene level, but rather the separation of taxa has permitted the (neutral) diversification among the genes by interrupting the genetic flow between separating groups. Neutral modifications are not historical : they do not define a directon in transformation (as the adaptive ones do).

As a result of this essential gene constancy, the cell metabolism remains substantially uniform in all organisms. It is the latter which has experienced the pressure of natural selection, transferring it to the genes. And what we have stated for genes can also be said of biochemistry. "It is not biochemical novelties which have generated diversification of organisms" wrote F. JACOB in 1977. "In all likelihood, it worked the other way around ... What distinguishes a butterfly from a lion, a hen from a fly, or a worm from a whale is much less a difference in chemical constituents than in the organization and distribution of these constituents. Biochemical uniformity is preserved by the genetic flow within species and – to a less restrictive extent – by the constraint of natural selection. When the former is interrupted, biochemical differences can appear in metabolic reactions no longer under the control of natural selection. They are not necessarily adaptive, and as far as we know, are rather losses. On the whole, all biochemical variation in the biosphere is marginal or largely neutral." Biochemical changes do not seem, JACOB (1977) wrote, to be a main driving force in the diversification of living organisms. The really creative part in biochemistry must have occurred *very early* ..... (my italics).

Quantum leaps among fossils. Among the records of paleontology, the part relevant to our argument is that which distinguishes the progressive from the steady-state picture. A succession of abrupt appearances does not differ from a steady-state situation, with the starting points scattered along the time.

The gradualness is first to be questioned at the very origin of life. That life was shaped on the Earth is more and more doubtful. The oldest 'compelling' evidence of life was considered to come from the superbe stromatolites in Canada (2.7 x 10^9 years), while the oldest 'possible' from Isua in Greenland (3.7 X 10^9 years) (NISBET, 1980). Very recent reports of bacterial chains from the 'North Pole' of Australia antedate the first 'compelling' evidence for life to 3.5 years ago. "If life did originate on Earth, – F.G. NISBET (1980) wrote – the processes leading up to it (*Proverbs,* 8.27) must have happened *very quickly indeed* (my italics). The age of the oldest traces of life approach that of the oldest rocks (3.8 – 3.9 X 10^9 years). These figures support the hypothesis of life coming to the Earth from the outer space (on a meteorite or in the tail of a comet?) and shift to the Infinite the problem of the Origin (HOYLE and WICKRAMASINGHE, 1978).

The "abiogenetic" theories are thus losing support. Even more so if we accept that the organisms of the "North Pole" were most likely photosynthetic and that the presumed methane/ammonium atmosphere of the primeval Earth should no longer be given serious consideration.

The explosive appearance of all the main *phyla* of Metazoa at the beginning of the Cambrian age (600 million years ago) is firmly established (only the Chordata would have appeared in the successive Ordovician period). No animal *phylum* came forth in the following epoch, not even when Metazoa colonized

the dry land. This may be described as the (catastrophic) conformation of living matter, as soon as the cellular state was achieved, to conform to the entire possible series of structural models available to metazoic growth. The gradual and haphazard development (by mutation-selection) of the types through adaption to the changing environmental conditions, according to the historical-evolutionary theory, would have produced the diversification of the large *phyla* as a final result and not as a first (SERMONTI and FONDI, 1980).

The explosive "radiation" of *taxa,* with all their subdivisions and the virtual absence of intermediate links, is the rule in paleontology (GRASSE, 1979). The best known example is in the mammals. All the orders appeared in a geologically short period of time and already perfectly formed, out of a form (*the mother*) which, according to GRASSE (1979) could not have been a specialized reptile, but rather a such primitive being to be almost identified with the *mother* of reptiles. Mammals would thus not be born *from* reptiles, but *among* reptiles. The 'experience' of reptiles could not be transferred to mammals.

The opinion that taxa appeared abruptly, by kind of *quantum leap,* not necessarily in a direction that represents an obvious improvement in fitness, is gaining increasing credit. This view of 'punctuated equilibria' cannot be said evolutionary. Genealogical trees, transitional forms and progressive adaptations, which are the factual basis of Darwinism are not consequential to it.

Was the diversification of life progressive? Did the major *taxa,* as the stratigraphic succession suggests, appear first and then, little by little, the minor? We have been particularly impressed by the arguments of David Raup who has listed as many as seven factors (the main being the antiquity of the beds) which would conceal a substantially stable state of diver-

sification in the biosphere. On the basis of complex statistical work, RAUP & STANLEY (1971) conclude that the present diversification (the assumed 4.5 million species) might not be significantly different from that in the Cambrian era or later. According to this view, the biosphere underwent transformation but not evolution, at least as far as the diversification of living beings is concerned. As repeatedly stated by GRASSE (1973), "Transformation is not evolution".

The Geometric Constants. The work by D'ARCY WENTWORTH THOMPSON (1961) *On Growth and Form* (1st edition 1917) is more and more frequently quoted in scientific writing. His central idea is that nature is simply a reflection of the forms conceived in geometry. Form problems are essentially mathematical, and growth problems are essentially physical. Morphogenetic solutions are primarily the result of a geometric pattern of growth, and secondarily an adaptation to the constraints of natural selection. The recognition of a "natural law of structure in the taxonomic system," (SACCHETTI, 1981) represents the affirmation of a universal harmony at the basis of *systema naturae.*

At the microscopic level, the presence of the Platonic solids and of deltahedrons in the forms of Radiolars (and viruses) is the most striking example of an indispensable structure in nature. The geometrical necessity of phyllotaxis according to Fibonacci's series (each term is the sum of the two preceding it)

1,1,2,3,5,8,13,21,34...

was recently restated by MITCHISON (1977).

The special relevance of the geometric view lies in the fact that the physico-mathematical rules which it implies are not historical. This is clearly stated by D'Arcy Thompson: *"In the physico-mathematical order of complexity, sequence and historic time are out of the question.*

The thinking of D'Arcy Thompson was adopted and deeped by Rene THOM (1972) who formulated a theory of morphogenesis *in abstracto*, purely geometrical, independent of the substrate of the forms and the nature of the forces which create them. Developed to the point of paradox, this theory does not explain why there is but a single form. THOM (1980) attributes the cause of morphogenetic differences to what he calls *elementary catastrophes*, determined by the topological structure of the internal dynamics. The morphogenetic laws, functioning as the form-builder, release biological information from the task of shaping forms, leaving to it the more modest function of opting for one or another *structurally stable* model.

Related considerations are to be found in the late WADDINGTON (1975), assessing the canalized development of the epigenetic trajectories (creods) or the principle of archetypes. Some living forms appear as an inevitable realization of some morphologic typologies, the necessity of which is illustrated by Waddington through geometric metaphores. It is by now an obsolete concept that Nature could have arrived at any form whatever and that natural selection would have chosen the most compatible with survival. This Empedoclean idea was abandoned by DARWIN (1869) himself who in *Descent of Man* wrote that "in most cases we can only say that the cause of any small variation and of any monstruosity is more in the nature and constitution of the organism than in the nature of the surrounding conditions.

Since the beginning, Life has an essentially constant genetic-biochemical structure. Its morphological variability is moreover under the control of physico-mathematical con-

stants also invariant in time. In both regards: the complexity present from the beginning and the geometrical rules present (as Wisdom) outside time, Life is not-historical.

Historical (evolutionary) processes in the realm of Life are likely confined to some phenomena so-called *orthogenetic*, the nature of which is still elusive, beside to some *degenerative* phenomena, easier to be figured in line with the entropy law.

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7

Essay Seven entitled *Eternity and Temporal Order: A view of Evolution from the Islamic Perspective* is another contribution from Seyyed Hossein Nasr. This essay, published in *RIVISTA DI BIOLOGIA*, 77:2 (1984), pp. 211- 221, is a revised version of a part of Chapter Seven ("Eternity and the Temporal Order") of the author's *Knowledge and the Sacred*. The book itself is based on Professor Nasr's Gifford Lectures which he delivered in 1981 at the University of Edinburgh, Scotland.

Essay Seven

Eternity and Temporal Order

A view of evolution from the Islamic perspective

by Seyyed Hossein NASR

"This world is the cultivating
field for the other world"
According to a hadith

ABSTRACT: The Christian belief in the irreversible directionality of history, secularized by the Promethean man, led to utopianism and the idea of progress and evolution. The deification of history has taken, for many people, the place of religion. Metaphysically speaking, the only meaning of evolution of anything is the actualization of its latent possibilities. Form is the imprint of an archetype and not the result of material accidents. Criticism by biologists and paleontologists opposing evolutionary 'faith' grows everyday. The attempts by Aurobindo and Teilhard to provide an evolutionary interpretation of theology mark the final phase of desacralization of knowledge and being, the devouring of the Eternal by the temporal process. According to tradition the present now is Eternity as it touches the plane of time.

I. THE DEIFICATION OF HISTORY

The deification of the historical process in secular terms has taken place in the modern world not only because the metaphysical teachings concerning time and eternity have been for-

gotten as a result of the desacralization of both knowledge and the world but also, as a result of the particular emphasis of Christianity upon history which is not to be found in other traditions. Christian thought, at least in its main line of development in the West, took history seriously, in the sense of believing in the irreversible directionality of history, the power which history possesses to introduce novelty of even a radical order, awareness of the uniqueness of each historic event which was to give rise in modern times to existentialism, the possibility of certain historical events to be decisive in a final way, the religious significance of human involvement in historical movements and institutions, and the importance of human freedom in not only determining the individual man's future but also the whole of history.

From these premises to the perspective of Promethean man, who secularized all of them and decided to mold his own destiny and history, was but a single step. And from the secularization of the Christian conception of history combined with messianism, those materialistic and secular philosophies have been born which are based on the view that the historical process is the ultimately real itself, and that through material progress man is able to attain that perfection which was traditionally identified with the paradisal state, with the terrestrial and celestial Jerusalem located at the alpha and omega points of history which are also the present now. Through historicism, secular utopianism, and the idea of progress and evolution, in a sense, time has, for modern man, tried to devour eternity and usurp its place, replacing the eternal now in which the eternal and the temporal meet with the present moment as the fleeting instant of transient pleasures and sensations. Paradoxically enough, the end results of this process is that this divinised time has not only destroyed the possibility of the

experience of eternity for those who have fallen under its hypnotic spell, but it also eclipsed the meaning of perpetuity and historical continuity and hence the sense of history itself.[1] The deification of historical process has become so powerful and such a compelling force that, in the souls of many human beings, it has taken the place of religion. Nowhere is this more evident than in the role that the theory of evolution plays in the mental and psychological life of those scientists who claim to look upon all things from a detached scientific point of view but who react with violent passion when the theory of evolution is discussed critically from any point of view–whether it be logical, theological, or scientific. In many ways and for profound reasons, evolution has become the substitute for religion for many people who defend it with complete intolerance while claiming to be very reasonable and tolerant beings without any strong religious beliefs.[2] For instance, E. SHUTE wrote: "For in its turn Evolution has become the intolerant religion of nearly all educated Western men. It dominates their thinking, their speech and the hopes of their civilization."[3] Others speak in categorical terms of the scientific method, then defend evolution on scientific grounds without being at all aware that their manner of accepting evolution as scientific has nothing to do with their own definition of what science is. Thus, in the late nineteenth

[1] It is amazing how so many young people of the present day lack an awareness of or interest in history, seeking to live as if they had no history.

[2] We use the term 'evolution' here to mean the belief that through natural agencies and processes, one species is transformed into another and not adaptations, modifications, and changes which do occur within a particular species in adapting itself to a changed set of natural conditions. Some scientists in fact distinguish between transformism implying change of one species into another and evolution as the biological transfromations within a species. See M. Vernet, *Vernet Contre Teilhard de Chardin,* Paris (1965) p. 30.

[3] See E. Shute, *Flaws in the Theory of Evolution,* Nutley, N.Jersey (1976), p. 228.

century the president of the American Association for the Advancement of Science and an avowed defender of 'the scientific method', Professor Marsh, said: 'I need offer no argument for evolution, since to doubt evolution is to doubt science, and science is only another name for truth."[4] Such attitudes involve the substitution of historical process for the Divinity. Moreover, this defense of evolution involves a battle for 'faith', not scientific truth, for it provides the only 'secular' means of providing some kind of a seemingly acceptable scheme to enable man to live in this world amidst the bewildering variety of the forms of nature while forgetting God.

2. EVOLUTION AS ACTUALIZATION

The criticisms which can be brought and have in fact been brought against the theory of evolution as currently understood, are at once metaphysical and cosmological, religious, logical, mathematical, physical and biological, including the domain of paleontology. There is, metaphysically speaking, no possibility of any temporal process adding something to Reality as such. Whatever grows and develops is the actualization of a possibility which had preexisted in the immutable world of the archetypes. Likewise, metaphysically speaking, that which belongs to a lower scale of being can never give rise to what belongs by nature to a higher level. The only meaning that the evolution of anything can have would be the actualization of the possibilities latent in that thing. Otherwise not all the eons of time can produce something out of nothing. What evolutionism does is to deify the historical process not only by

[4]Quoted in D. Dewar, *Difficulties of the Evolution Theory*, London (1931), p. 3. One wonders by what definition of science such a statement, which is so typical when the question of evolution is discussed, can be called scientific.

considering it as the ultimately real but also by transferring the power of *creation ex nihilo* from the transcendent Divinity to it.

Also, from the metaphysical and cosmological points of view, form is the imprint of an archetype and a divine possibility and not an accident of a material congregate. Moreover, form is quality and qualities do not add up as do quantities. In life forms the reality of any form is irreducible to its quantitative components. Would half a human body be qualitatively half of the complete human body? Forms of living beings have a qualitative reality which cannot evolve from any other form unless that form were also present 'somewhere'. And that 'somewhere' cannot metaphysically have any locus but the archetypical world which is the origin of all forms.

From the purely religious point of view, the evidence against evolution is universal even in traditions such as Hinduism, Jainism, and Buddhism where cosmic history is envisaged on grand scales and where there has been perfect awareness among those who read their Sacred Scriptures that the world has been around much longer than six thousand years, that other creatures have preceded man on earth, and that the geological configuration of the world has changed. The same can be said of Islam where, over a thousand years ago, Muslim scientists were perfectly aware that sea shells on top of mountains meant that mountains had turned into seas and seas into mountains and that land animals had preceded man on earth and that sea animals had come before land animals. 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. In all sacred books man descends from a celestial archetype but does not ascend from

the ape or some other creature. Whatever conconctions of scriptural evidence have been made up to support modern evolutionary theory since the last century, they are based upon the forgetting of the traditional and sapiential commentaries and on interpreting the vertical scale of existence in a temporal and horizontal fashion as was done philosophically as a background for the rise of ninteenth century evolutionary theory itself. The remarkable unanimity of sacred texts belonging to all kinds of peoples and climes surely says something about the nature of man. In any case, it is more proof against those who would seek to make use of a particular text from one tradition or few lines judiciously chosen from a certain scripture which would lend themselves more easily to misinterpretation in order to demonstrate religious support for the validity of the theory of evolution.

3. SOME BIOLOGICAL CRITICISMS

As far as biological and paleontological evidence is concerned, there are numerous arguments outlined by experts in these fields many of whom hardly dare express their views until old age for fear of being ostracized by their professional colleagues. Nevertheless, the number of works by scientists in these fields, which point to the impossibility of the theory of evolution, the theory that E. F. SCHUMACHER calls science fiction rather than science,[5] grows substantially every day and includes not only biologists but also geneticists, physiologists, and men from many other disciplines in the life sciences.[6] As

[5]See his *Guide for the Perplexed*, p. 133 where Schumacher writes, "Evolutionism is not science; it is science fiction, even a kind of hoax."

[6]Among the growing number of scientific works critical of the theory of evolution one can mention D. Dewar, *The Transformist Ilusion*, Murfreesboro (1955); his already cited *Difficulties of the Evolution Theory;* Shute, *op. cit.*; L. Bounoure, *Déterminisme et finalité*, Paris (1957); E. L. Grant – Watson, *Nature Abounding*, London (1941); and G. Sermonti and R. Fondi, *Dopo Darwin*, Milan (1980).

During the past few years a number of works against the Darwinian theory of evolution have appeared from specifically Christian circles but from the scientific and not just theological or religious point of view. See, for example, D. Gish, *Evolution, the Fossils Say No*, San Diego, Calif. (1980); B. Davidheiser, *Evolution and Christian Faith*, Phillipsburg, N.J. (1978); H. Hiebert, *Evolution: Its Collapse in View?*, Beaverledge, Alberta, Canada (1979); and H. M. Morris, *The Twilight of Evolution*, Grand Rapids, Mich. (1978). Most of these works base the religious aspect of their criticism solely upon Christian sources without reference to other traditions, but they also all rely upon scientific criticism of the theory of evolution and not just "Biblical evidence".

[7] See N. Eldredge and S.J. Gould, "Punctuated equilibria: an alternative to phyletic gradualism," in *Models in Paleontology*, San Francisco (1972).

[8] "Some biologists appreciate the fact that the lack of fossils intermediate between the great groups requires explanation unless the doctrine of evolution in any of its present forms is to be abandoned." Dewar, *Difficulties of the Evolution Theory*, p. 141.

[9] See, for example, D. Raup and S. Stanley, *Principles of Paleontology*, San Francisco (1971).

for paleontological evidence, the first fact which confronts any student of the field is the appearance of new species in new geological periods in a sudden manner and over very extended areas.[7] Major groups such as the mammals appear all of a sudden in the form of more than a dozen classes and everywhere one detects the sudden rather than gradual appearance of complex organisms. Moreover, the stratigraphic record hardly ever reveals fossils which should exist as intermediates between the great groups, something which should be present if the theory of evolution as usually understood were to be accepted.[8] Furthermore, all the reasons given by defenders of evolution as to why the paleontological record does not in fact provide any such evidence have been refuted by numerous scientists.[9] As for plants, the situation is even more difficult to explain than is the case for animals. The paleontological record hardly supports the evolutionary hypothesis no matter how far it is stretched and how farfetched is

its interpretation.[10] The most damaging evidence comes of course from the lack of the complex traces of life in the pre-Cambrian and its sudden profusion afterwards. Anyone who studies this record with an open mind cannot but be impressed by the sudden appearance of a new force or energy upon the surface of the earth, manisfesting itself and leaving its mark upon the geological record in a manner that can hardly be called evolutionary. The whole paleontological evidence of the Cambrian as distinct from the pre-Cambrian points to anything but the gradual evolution of life forms.[11] As for the post-Cambrian, the record reveals that nearly all the phyla of animals known were already present in the Cambrian – such as Porifera, Coelenterata, and Annelida – and that no new types have arisen since the Paleozoic.

The mutations of which many biologists speak and through which they seek to explain what they call evolution in fact never exceed a very limited boundary and represent either an anomaly or a decadence of the species in question. The hiatus remains unexplained by any of the mutations observed in biology unless one posits at other periods different forces acting on earth from those now observable. None of the variations which are presented by advocates of evolution as 'buds' of a new species have in fact been anything more than variants within the framework of a specific species. As for adaptations, there are some so complex that any evolutionary theory would

[10] In the case of plants, "geological problems raised by paleo-botany are so great that a botanist must question the evolutionary sequence of plant forms." See Shute, *op. cit.*, p.14.

[11] Referring to the lack of a trace of life in the pre-Cambrian, Shute writes, "These despairing suggestions point up the remarkable dilemma of the evolutionist who leans on palaeontology for its customary support. What greater degree of disproof could palaeontology provide? Millions of years of 'No' is indeed a resounding 'No'!" *Ibid*, p.6.

be hard put to explain. That is why the more objective among biologists, even when they do accept the theory of evolution for what they feel is the lack of any other 'scientific' alternative, remain fully aware of the fantastic and even 'surrealistic' character of evolutionary theory as usually understood.

One of the leading biologists of France, J. Rostand, writes, "The world postulated by transformists is a fairy world, phantasmagoric, surrealistic. The chief point, to which one always returns, is that we have never been present even in a small way at one authentic phenomenon of evolution". Yet he adds, "I firmly believe – because I see no means of doing otherwise – that mammals have come from lizards, and lizards from fish ; but when I declare and when I think such a thing, I try not to avoid seeing its indigestible enormity and I prefer to leave vague the origin of these scandalous metamorphoses rather than add to their improbability that of a ludicrous interpretation."[12]

Certainly biology has not provided any proofs for this theory in the scientific sense of proof, but it has provided numerous obstacles which can only be overcome by a 'leap of faith'. The criticisms against the evolutionary theory and problems associated with it are so numerous that certain modern scientists have even suggested that Darwinism and Lamarckism are burdens upon the science of biology itself and that this science should be allowed to develop without having to bear the burden of a philosophical assumption which does not correspond to its findings but in fact puts an immense constraint upon this science in order to enable modern man to continue to use this crutch for his unending worship of the historical and temporal process as reality.[13]

[12] *Le Figaro Littéraire*, April 20, 1957.

[13] R. Fondi, concluding his contribution to an anti-Darwinian book, writes: "Our

4. TEILHARD AND THE 'DARWINIZATION' OF THEOLOGY

If in the nineteenth and early twentieth centuries evolutionary theory affected European philosophy in various ways, ranging from Nietzsche's superman to the emergent evolution of Samuel Alexander and the creative evolution of Henri Bergson, it nevertheless remained for the latter half of the twentieth century for this type of thought to enter into the realm of Catholic theology itself and to produce that 'Darwinization' of theology, and the surrender of this queen of the sciences to the microscope,[14] which is represented by Teilhard de Chardin. Strangely enough, in this domain the French Jesuit was preceded by an Oriental, namely Sri Aurobindo, who in his *Life Divine* had tried to provide an evolutionary interpretation of the Vedanta but who did not have the same influence or effect in India as Teilhard has had in the West.[15] It is in fact

end results is necessarily the following: Biology will not get any advantage out of the attitudes of Lamarck, Darwin and the modern hyper-Darwinists; on the contrary, it must soon move out of the constraints and the blind alleys of the evolutionary myth, to take again its safe way along the open and bright paths of Tradition." See G. Sermonti and R. Fondi, *Dopo Darwin*, pp. 334-35.

[14] "The speculations of Teilhard de Chardin provide a striking example of a theology that has succumbed to microscopes and telescopes, to machines and to their philosophical and social consequences, a 'fall' that would have been unthinkable had there been the slightest direct intellective knowledge of the immaterial realities. The 'inhuman' side of the doctrine in question is highly significant." Schuon, F., *Understanding Islam*, London (1968), p.32.

[15] . On Sri Aurobindo and Teilhard de Chardin and their "evolutionary religion" see R.C. Zaehner, *Evolution in Religion: A Study in Sri Aurobindo and Pierre Teilhard de Chardin*, Oxford, 1971; also his *Matter and Spirit, Their Convergence in Eastern Religions, Marx, and Teilhard de Chardin*, New York, 1963, which is a study of religion from the Teilhardian perspective. As Zaehner points out, in the case of both Sri Aurobindo and Teilhard de Chardin, there is a passionate belief in evolution and the salvation of the whole of humanity in the Marxist sense along with the "mystical" vision of the spiritual world which Zaehner interprets as a new synthesis but which from the traditional point of view cannot but be the eclipse of *Ātman* by *māyā* to such

noteworthy to mention that, in the Orient, it is only in the Indian subcontinent that, as a result of Anglo-Saxon education with its heavy emphasis upon such evolutionary philosophers as Herbert Spencer, there has appeared not only a figure such as Aurobindo but a whole army of 'evolutionary thinkers' of lesser eminence. Also it is from this world that that peculiar wedding between pseudospirituality and evolutionism, with talk of cosmic consciousness and the birth of a new humanity with evolved consciousness and the like, has spread to the rest of the world. Neither Buddhist Japan and China nor the Islamic world, despite the talk of Iqbal about the superman, produced the same blend of religion and evolution that we find in Aurobindo. It is therefore somewhat strange that the Western counterpart of Aurobindo should hail not from the land of Darwin but that of Claude Bernard and Cuvier.

From the traditional point of view Teilhard represents an idolatry which marks the final phase of the desacralization of knowledge and being, the devouring of the Eternal by the temporal process, if such were to be possible. It is therefore all the more strange that some should consider his work as "the resacralization of the profane world."[16] The fact that there has been such a flood of popularized writings about him, even journals being devoted to the study of his works[17] and that he

a degree that it can only occur in the deep twilight of a human cycle before the blinding Sun of the Self lifts once again all veils of illusion, evaporates all clouds of doubt, and melts all those idols of perversion and inversion of the truth.

[16] See P. Chanchard, *Man and Cosmos – Scientific Phenomenology in Teilhard de Chardin*, New York, 1965, whose chap. 8 is entitled "The Resacralization of the Profane World." He writes, "Here is the real meaning of Teilhard's work ..... *It is a matter of resacralizing a profane world by giving even the profane its own sacred character*" (p. 170).

[17] On Teilhard de Chardin see P. Smulders, *Theologie und Evolution, Versuch über Teilhard de Chardin*, Essen 1963; E. Rideau, *Teilhard de Chardin: a Guide to His Thought*, trans. R. Hague, London, 1967; H. de Lubac, *The Eternal Feminine*,

has caught the attention of such a wide audience, including many not at all attracted to authentic religion, can only mean, in a world such as ours, that he caters to certain of the anti-traditional and even countertraditional[18] tendencies of this world – most of all to that psychological formation which is the result of the domination of the evolutionary way of thinking upon the mind and psyche of most modern men.[19]

For Teilhard, evolution embraces not only living creatures but even nonliving matter. All cosmic matter, which he addresses as 'O Holy Matter!' (a caricature and a parody of 'O Holy Mother!'), follows the law of 'complexification' which leads the cosmic 'stuff' to rise from stage to stage until it reaches man. All beings for him have a conscious inner face (not to be confused with the traditional Hindu doctrine that equates existence itself with consciousness) like man himself, and evolution also implies the evolution of consciousness from life and matter. This evolution has not only brought forth the biosphere to cover the earth but through human culture has led to the noosphere which has become imposed upon the biosphere. At a later stage of this supposed evolution human cultures will become one. Through the psychic concentration

trans. R. Hague, London, 1971; H. de Lubac, *The Faith of Teilhard de Chardin*, trans. R. Hague, London, 1965; C. Cuénot, *Teilhard de Chardin et la pensée catholique*, Paris, 1965; and M. Barthélemy-Madaule, *Bergson et Teilhard de Chardin*, Paris, 1963. There is a veritable flood of writings on him mostly by admirers or apologists while the most acute criticisms of a scientific nature have come from such French scientists as M. Vernet.

18 "The modern psyche is dominated by time, matter, change and is relatively blind to space, Substance and Eternity. To oppose one's thoughts to the Theory of Evolution is to think in a way which is contrary to the common tendency of the modern psyche." M. Negus, "Reactions to the Theory of Evolution," in *Studies in Comparative Religion*, Summer-Autumn 1978, p. 191. (See *Essay Five* of this book).

19 Teilhard's type of pseudospiritual evolutionism could not in fact have gained wide support without that psychological attitude that has been already molded by the influence of the ideas of progress and evolution.

thus created a 'hyperpersonal' consciouness will come into being at the 'Omega point' where evolution will end in convergent integration, this point being God in as much as He determines the direction of history. It is through this fantastic mental sublimation of a crass materialism that Teilhard seeks to synthesize science and religion and give Christian significance to the evolutionary hypothesis *cum* science.

First of all, from the metaphysical and religious points of view this amalgamation rather than synthesis cannot be considered as anything but the inversion of the traditional doctrine of emanation and the generation of the hierarchy of existence. For Teilhardism, it is not only the question of neglecting the aspect of discontinuity between the Principle and Its manifestation,[20] which would result in a kind of philosophical pantheism encountered often in the history of Western thought, but of even considering the Principle as the end product of the evolution of manifestation itself. When Teilhard says, "If, in consequence of some inner subversion, I should lose successively my faith in Christ, my faith in a personal God, my faith in the Spirit, it seems to me that I would continue to believe in the world. The world – the value, the infallibility and the goodness of the world – this is, in the last analysis, *the first and the only thing in which I believe*", he is expressing openly that worship of mammon which theologically could not but be called idolatry. And even when he asserts his faith in the Omega point evolving from evolutionary processes, he is denying the totality of all traditional teachings and clinging to

20 "All errors concerning the world and God consist either in a 'naturalistic' denial of the discontinuity and so also of transcendence – whereas it is on the basis of this transcendence that the whole edifice of science should have been raised – or else in a failure to understand the metaphysical and 'descending' continuity which in no way abolishes the discontinuity starting from the relative." Schuon, *Understanding Islam*, pp. 108-9.

only a truncated and subverted version of them, for Christ did say he is the alpha *and* the omega; in the Quran God is called not only the last or omega (*al-ākhir*) but also the first (*al-awwal*), not only the outward (*al-ẓāhir*) but also the inward (*al-bāṭin*).

The criticism against Teilhard's amalgamation of religion and science cannot be limited to the religious pole but includes the scientific one as well. All the criticism brought against evolutionary and transformist theories in general applies to Teilhard as well who defended them not with scientific reasoning but with a 'religious' passion. Moreover, Teilhard has been criticized for his views on biology and physiology with which he was not very familiar but from which he sought to draw philosophical and religious conclusions.[21] He sought to create a cosmic unity through the reduction of vital energy to physical energy and to equate the laws of living beings which possess finality in the biological sense[22] with those of inert matter which is of a very different nature, and in which the same kind of finality cannot be observed, although from the traditional metaphysical point of view, very far from that of Teilhard, everything in the universe possesses a purpose and an entelechy within the total harmony of the cosmos. His 'unity' is more a uniformity, reducing all levels of cosmic reality to the material one rather than true unity which integrates instead of leveling and reducing things to their least common denominator.[23]

[21] "Teilhard n'était pas un biologiste; la physiologie générale en particulier lui était éntrangère. Il en résulte que les déductions qu'il tire des perspectives qu'il prend sur le plan philosophique et religieux se trouvent fausées, dès lors que les bases elles-mêmes sur lesquelles il entendait se fonder, s'effondrent." Vernet, *La Grande illusion de Teilhard de Chardin*, p.107.

[22] On finality in this sense see L. Bounoure, *Déterminisme et finalité*.

[23] "Certains font honneur à Teilhard d'avoir concu une unité cosmique; or, cette unité est fausse. Tout reduiré à une seule et même enérgie physique d'où découleraient tous les phénomenès, selon des processus purement matériels, ne réspond pas, nous venons de le voir, à la realité du monde et de la vie. Telle a été l'immense illusion de Teilhard." Vernet, *op. cit.*, p. 123.

[24] T. Burckhardt, "Cosmology and Modern Science," in J. Needleman (ed.), *The Sword of Gnosis*, p. 153.

If we have paused to criticize Teilhardism in the midst of this discussion of time and Eternity, it is because the unveiling of the nature of this type of phenomenon is one of the most important tasks if one is to resuscitate traditional doctrines in an authentic manner, for it is not only the antitraditional but even more the countertraditional that veils the nature of tradition of which it is a veritable caricature. In fact, "Teilhardism is comparable to one of those cracks that are due to the very solidification of the mental carapace, and that do not open upward, toward the heaven of true and transcendent unity, but downwards towards the realm of psychism."[24] The slightest intuition of the immutable archetypes and the sense of the Eternal would have evaporated this fog of illusion which seeks to sublimate the temporal into the order of the Eternal of which it cannot be but a shadow.

5. THE ISLAMIC MEANING OF BECOMING

The traditional response to either the Hegelian or Marxist reification and even deification of the historical process or, what is even more insidious from the traditional point of view, that mixture of evolutionism and theology found in Teilhard can be discovered not only in the metaphysical doctrines concerning Eternity and the temporal order but also in those traditional philosophies of becoming which treat in a more directly philosophical way those currently popular philosophical theories which would make of the evolutionary process the

progenitor of either the perfect society, or the Spirit of Omega point itself. One of these philosophies is that of Ṣadr al-Dīn Shīrāzī whose transubstantial motion (*al-ḥarakat al-jawhariyyah*) treats fully the significance of movement and becoming while remaining aware of the archetypical realities which manifest themselves through the 'substantial becoming'.[25] Likewise, Jalāl al-Dīn Rūmī deals extensively with dialectic and the oposition between what Hegel and Marx called thesis and antithesis without ever elevating the historic process to the level of the Truth which is by nature immutable and eternal. (It is this fact that has caused certain modern Marxists in the Islamic world to claim Mawlānā Jalāl al-Dīn Rūmī as their ancestor, misinterpreting completely the dialectic of Rūmī with its vertical and which possesses a transcendent dimension to make it conform to the Hegelian-Marxist one). It is such sources, whether Islamic or otherwise, that alone can explain the meaning of becoming, the scales of cosmic beings including living forms, the vertical hierachy stretching from the lowest material form through man to the Divine Presence, and even the mutilation and inversion of these teachings in modern times. And for that very reason it is through the subversion of such traditional teachings that tradition itself is betrayed by forces which parade under a religious guise while helping to accomplish the final shortlived victory of the temporal over the Eternal, of the profane over the sacred.[26]

[25] The doctrine of transubstantial motion presents, within the cadre of traditional teachings, one of the most systematically exposed and logically appealing formulations of the meaning of change in the light of permanence. It is associated with the school of Ṣadr al-Dīn Shīrāzī, who instead of limiting motion to the four accidents of quality, quantity, position, and place as did the Peripatetics, also accepts motion in the category of substance without in any way denying the reality of the immutable archetypes or essences. For an explanation of this difficult doctrine see the articles of Sayyid Abu'l-Ḥasan Qazwīnī and 'Allāmah Ṭabāṭabā'ī in S. H. Nasr (ed.), *Mullā Sadrā Commemoration Volume*, Tehran, 1380 (A.H., solar); also, S. H. Nasr, *Islamic Life and Thought*, pt. 3, pp. 158ff; and idem, *Ṣadr al-Dīn Shīrāzī, pp. 932-61.*

Ultimately the temporal can no more be made to replace the Eternal and to consume it than can the sun be hidden in a well. The traditional doctrine of Eternity and the temporal order cannot itself change or evolve because it belongs to the Eternal order. This doctrine not only distinguishes between time and Eternity but also 'modes of time' in accordance with modes of consciousness.[27] Its concern is not only with profane time and God as the Eternal but also with those intermediate modes of becoming associated with eschatology whose final end is the abode of Eternity in its absolute sense.[28] Finally, this doctrine is concerned with that present now which is Eternity as it touches the plane of time, the moment which is both alpha and omega in which man encounters the Eternal that is

[26] It is interesting to note that if such movements in Hinduism and Christianity have resulted in figures like Sri Aurobindo and Teilhard de Chardin, in Buddhism and Islam they have given rise to that unholy wedding of ideas taken from these religions and Marxism by those who have called themselves Buddhist Marxists and Islamic Marxists. The political consequences of the thought of the first group should at least cause a moment of pause for those who hoist the banner of Islamic Marxism.

[27] For example, in Sufism certain authorities distinguish between external time (*zamān-i-āfāqī*, literally "time of the horizons") and inward time (*zamān-i-anfusī*, literally "time of the souls") in referance to the Quranic verse concerning the manifestation of the portents (āyāt) of God "upon the horizons (*āfāq*) and within themselves (*anfus*)."They also state that each world through which the spiritual adept journeys has it own "time." On *zamān-i-āfāqī and zamān-i-anfusī* see H. Corbin, *En Islam iranien*, vol. 1, pp 177ff.

[28] No exposition of traditional doctrines would be complete without a discussion of eschatology which constitutes an essential teaching of every religion and whose full significance can only be grasped through the esoteric dimension of tradition and the scientia sacra which provides the necessary metaphysical knowledge for the treatment of the subject. The bewildering complexity of eschatological realities which lie beyond the ken of man's earthly imagination can only be grasped through the revealed truths as they are elucidated and elaborated by an intelligence imbued with the sense of the sacred, but even in this case it is not possible to say the last word about them.

the Sacred as such, the moment that is the sun-gate through which he passes to the Beyond, becoming finally what he always is, a star immortalized in the empyrean of Eternity.

O soul, seek the Beloved, O friend, seek the Friend,
O watchman, be wakeful: it behooves not a watchman to sleep.
On every side is clamour and tumult, in every street are candles and torches,
For tonight the teeming world gives birth to the world everlasting.
Thou wert dust and art heart, thou wert ignorant and art wise;
He who has dragged thee this far shall drag thee to the Beyond through His pull.

RŪMĪ[29]

[29] Tran. R.A. Nicholson, *in Selected Poems from the Dīvāni Shamsi Tabrīz,* Cambridge, 1898, pp. 141-43 (revised).

It is so significant that Zaehner in his already cited work on Teilhard de Chardin and Sri Aurobindo quotes from this poem as an affirmation of the evolution of spirit from matter, whereas this whole poem is about the death of the saint himself, that is Rūmī, and the miracle of the return of the purified and sanctified soul which has itself descended from the realm of the Eternal into the stream of becoming back to the abode of the Beloved.

8

Essay Eight, *The Nature and Extent of Criticisms of Evolutionary Theory,* is contributed by Osman Bakar, a lecturer in History and Philosophy of Science at the Faculty of Science, University of Malaya, Kuala Lumpur. It was originally a research paper submitted by the author to the Department of Religion, Temple University, Philadelphia in partial fulfillment of a course requirement in a PhD program at that department.

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Essay Eight

The Nature and Extent of Criticism of Evolutionary Theory

By 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

[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.

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 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

[2] See Spencer, H., *The Principles of Biology*, revised ed., London (1898), 1st. volume.

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

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 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

[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*, John Hopkins Press, Baltimore, 1968 edn., chapter 13, pp. 356-414.

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 nonmechanistic 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 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

[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, nonmechanistic 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 Conciousness and Form*, Bala Books, New York (1981). Thompson is a mathematician and research scientist in mathematical biology.

[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.

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 metaphysical tradition in 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 take a closer look at each of these types of criticisms and investigate to what extent are the ideas embodied in them 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

[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.

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 secularised philosophical and scientific layer enveloping the minds of Western man.[13] In reality, therefore, what characterizes nineteeth-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

[13] See Nasr, S. H., *Knowledge and the Sacred*, pp. 97 – 99.

[14] Paul Edwards, ed., *The Encyclopedia of Philosophy*, p. 303.

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. As pointed out by 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 naively transferred from the supratemporal 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, have all been emptied of

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

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

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 .[17] 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 mathematician by training. His first book was published in 1921 and entitled *Introduction générale a l'étude des doctrines hindoues (General Introduction to the Study of Hindu Doctrines).* This was the first full exposition of the main aspects of traditional doctrines. A complete guide to Guenon's intellectual career and works during the next thirty years was provided by another eminent metaphysician, Ananda K. Coomaraswamy (1877-

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

[17]Nasr, S. H., *op. cit.*, p. 100.

1947) in an essay entitled *Eastern Wisdom and Western Knowledge*[18].

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[19]. Like Guénon, he also produced numerous articles and books on metaphysics and cosmology which in many respects complemented the works of the former[20]. Through his writings, Coomaraswamy played a great role in reviving the traditional point of view. Professor Nasr, in his study of the history of 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 (b. 1907), 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 depths and amplitudes[21].

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

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

[19]*Ibid*, p. 8.

[20] Nasr, S. H., *op. cit.*, p. 105.

[21]*Ibid*, p. 107.

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. Guénon, for example, criticized evolution in his exposition of the traditional doctrine of heirarchy of existence or the multiple states of being[22] and the theory of cosmic cycles[23] among others; Coomaraswamy discussed in several of his essays the distinction between the traditional doctrine of gradation and the modern theory of evolution[24]; as for 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-Manisfestation relationship[25]. In all these criticisms, the fundamental ideas associated with creationism of the nineteenth century namely the immutability of species, divine archetypes, creation and design in Nature, which were described by 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

[22]See his "Oriental Metaphysics" in Needleman. J., (ed), *op. cit.*, pp. 40 – 56.

[23]René Guénon, *op. cit.*, p. 50.

[24]Coomaraswamy, A. K., *op. cit.*, Chapter VII. pp. 118 – 124. See also his *Time and Eternity*, pp. 19 – 20.

[25]See his *Dimensions of Islam*, trans. Townsend, P. N., Allen and Unwin, London (1970), pp. 153 – 155: and also his *Stations of Wisdom*, trans. Palmer, G. E. H., Perennial Books, Bedfont, Middlesex, pp. 93 – 95.

criticisms of evolution. In a sense we can speak of traditional metaphysics as a whole as an implied criticism of evolution and all its generalisations and implications in as much 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 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 Guénon, Coomaraswamy and Schuon. Among them we can mention Titus Burckhardt, Martin Lings and Seyyed Hossein Nasr[26]. As for the development of

[26]Burckhardt's detailed criticisms of evolution can be found in his "Cosmology and Modern Science" in Needleman, J., *op. cit.*, pp. 122 –178; For Martin Lings's criticisms, see his "Signs of the Times" in the same book, pp. 109 –121 and *Ancient*

metaphysical criticisms in the second sense, it is "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[27].

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

> The traditional point of view expanded with such rigor, depth and grandeur by Guénon, Coomaraswamy, and 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 immerasurable. 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

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.

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

> view, and many scholars and thinkers of note have espoused certain basic traditional theses.[28]

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 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. 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 possiblility 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

[28]Nasr. S. H., *Knowledge and the Sacred*, p. 109.

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.[29]

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" (*khazanay-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 Schuon referred. The various degrees of reality contained in the Divine Principle are in ascending order, the following: *first*, the material state (or gross, corporeal or sensorial); *secondly*, the subtle state (or animistic); *thirdly*, the angelic world (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')[30]

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

[29]Schuon, F., *Dimensions of Islam*, pp. 153 -154.

[30]*Ibid*, p.142.

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 "protomatter", this "form" referring to the association of qualities of the species which is therefore the trace of its immutable essence[31].

This means that different types of animals, for example, preexisted at the level immediately above the corporeal world as nonspatial forms but clothed with a certain "matter" which is of the subtle world[32]. 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 a new species did not leave a mark on

[31]Burckhardt, T., "Cosmology and Modern Science", *op. cit.*, p. 140.

[32]*Ibid*, p. 148

the physical plane of reality[33]. 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[34]. 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[35].

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 heirarchy 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 Burchardt's essay (see next essay). 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.

[33]*Ibid*, pp. 148 – 149

[34]Nasr. S. H., *op. cit.*, p. 235

[35]Dewar, Douglas, *The Transformist Illusion*, Murfreesboro, Tenn., Dehoff Publications, (1957). Quoted by Burckhardt, *op. cit.*, p. 141

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[36]. There is as yet no complete account of the history of scientific opposition to the theory of evolution. 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*[37]. 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 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. 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. (See essay one of this book).

[36]"... 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 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

[37] 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*.

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 over-zealous attempts to ensure the dominance and supremacy of 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 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[38], England's foremost comparative

[38]On their critiques see Gillespie, N. C., *op. cit.*, p. 22.

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[39]. 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[40]. Where they differ is in their views of the 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 in so far 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"[41] took them closer to positivism and out of the realm of special creation. As

[39]*Ibid*, p. 26

[40]*Ibid*, chap 5 entitled "Providential Evolution and the Problem of Design".

[41]*Ibid*, p. 103

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 marshalled 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, analysis 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 satisfies 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 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 nineteeth-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[42].

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 on 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[43]. 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[44]. There is also the admission by a Sorbonne Professor

[42]Martin Lings, "Signs of the Times," in Needleman, J., *op. cit.*, p. 112.

[43]Gillespie, N. C., *op. cit.*, p. 147

[44]Martin Lings, *Ancient Beliefs and Modern Superstitions*, pp. 5-6

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[45].

The general disagreements 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 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."[46] One of the participants, Niles Eldridge, 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."[47]

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 replace-

[45] *Ibid*, p. 5

[46] Richard L. Thompson, *op. cit.*, pp. 183 –184

[47] *Ibid*, p. 185

ment 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 scepticism 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,[48] intellectual intolerance and dishonesty on the part of many evolutionists. This intellectual intolerance and dishonesty manifests itself 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[49]. As for intellectual dishonesty, one may refer to the famous hoax connected with the 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 it would have achieved far greater progress had it not been addicted to evolutionary thinking. They did 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 was directed into unprofitable channels. Too much time, labour 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

[48] Thompson, F.R.S., *Science and Common Sense,* London (1937), p. 229

[49] See *Essay One* in this book.

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.[50]

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 criticized the theory of evolution from the view-point 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 Conciousness 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.[51] 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 length of the shortest computer program that can numerically solve the equations of motion for the theory to within any desired degree of accuracy."[52] His fundamental argument is that in a physical system governed by simple

[50]*Ibid.*
[51]See Thompson, R. L., *op. cit.*, p. 97
[52]*Ibid*, p. 105

laws, any information present in the system after trasformations 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.[53]

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

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

gaining momentum. These scientific criticisms, coming as they were from different sciences, call into question the status of evolutionary doctrine 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.[54] As for philosophical criticisms, Thompson referrred 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.[55] 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:

[54]Nasr, S. H., *op. cit.*, p. 237

[55]See Essay One in this book

> 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.[56]

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 scepticism 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, ascendency 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 ...[57]

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

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

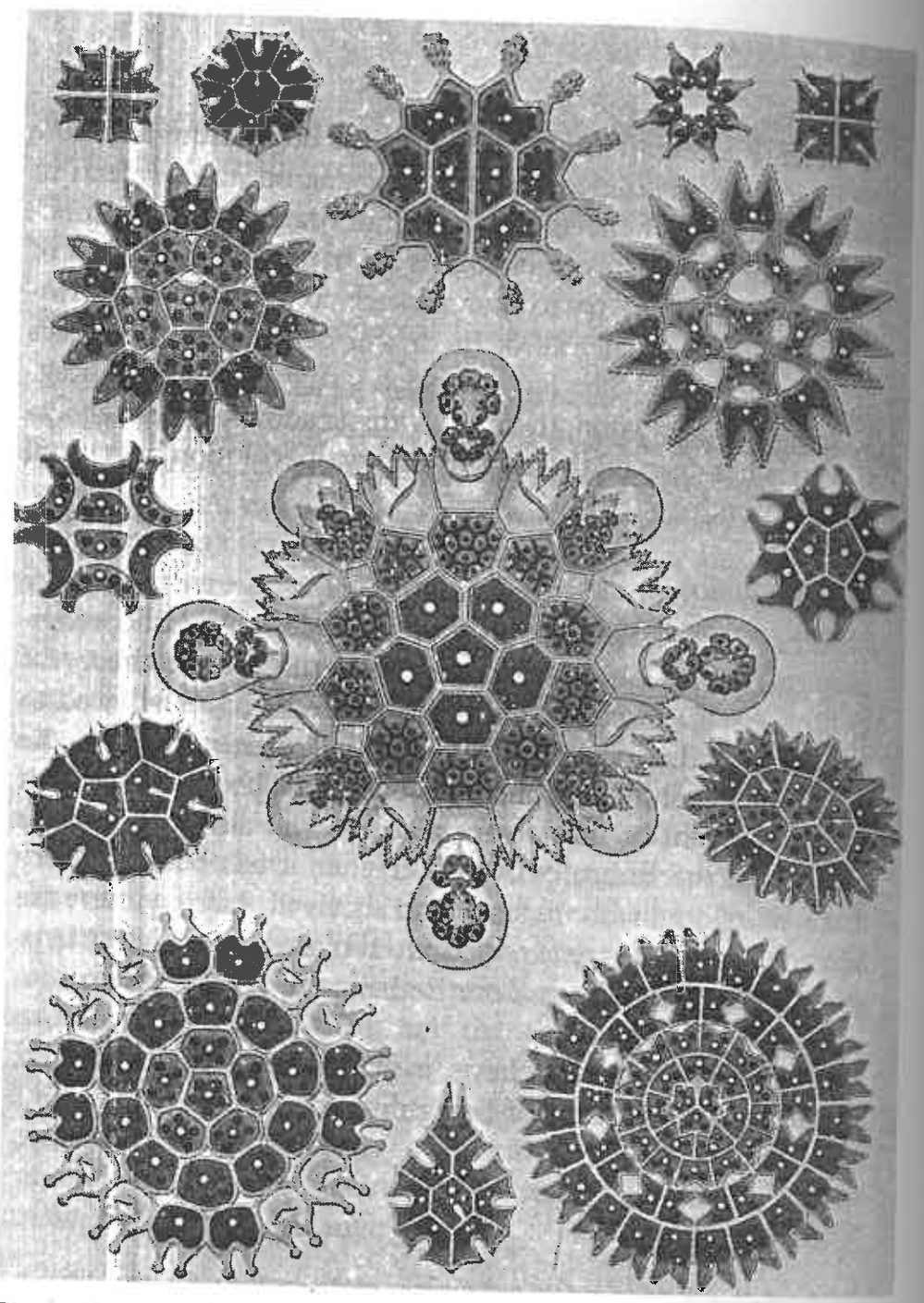

Plate 5. Various species of Hydrodictyaceae (colonial algae)

"Geometrical forms are so many images of unity."
(Frithjof Schuon).

9

Essay Nine is entitled *Evolution and the Traditional Idea of the Immutability of Species.* Its author is Titus (Ibrahim) Burckhardt (1908- 1984), a metaphysician and a leading contemporary scholar of comparative art. The essay is extracted from the author's *Cosmology and Modern Science,* an article which first appeared in the journal *Studies in Comparative Religion* (1964, 1965) and later as a chapter of *The Sword of Gnosis* (ed. Jacob) Needleman, 1974).

Burckhardt spent his youth studying art, art history, and oriental languages and travelling throughout North Africa and West Asia. From 1942 until 1968 he was director of Urs Graf – Verlag, a publishing house specializing in facsimile editions of ancient manuscripts. He translated many important works from Arabic into several European languages.

His well-known books include *Moorish Culture in Spain, An Introduction to Sufi Doctrine, Sacred Art in East and West, The Art of Islam,* and *The City of Fez.*

Essay Nine

Evolution and The Traditional Idea of Immutability of Species

By Titus Burckhardt

Even the least phenomenon participates in several continuities or cosmic dimensions, incommensurable in relation to each other; thus, ice is water by its substance, and in this respect it is not distinguishable from liquid water or water vapor, whereas it belongs by its state to solid bodies. Similarly, when a thing is constituted by diverse elements, it participates in their natures even while differing from them. Cinnabar, for instance, is a synthesis of sulfur and mercury; it is thus in some sense the sum of these two elements, but at the same it possesses qualities that are not to be found in either of the above two substances. Quantities can be added to one another, but a quality is never only the sum of other qualities. By mixing the colors blue and yellow, green is obtained; this third color is therefore a synthesis of the other two, but it is not the product of a simple addition, for it represents at the same time a chromatic quality that is new and unique in itself.

Herein is to be seen something like a discontinous continuity, which is even more marked in the biological order, where the qualitative unity of an organism is plainly distinguishable from its material composition. The bird that is born from the egg is made of the same elements as the egg, but

it is not the egg. Similarly, the butterfly that issues from a chrysalis is neither that chrysalis nor the caterpillar that produced it. A kinship exists between these various organisms, a genetic continuity, but equally they display a qualitative discontinuity, since between the caterpillar and the butterfly there is something like a rupture of levels.

At every point of the cosmic tissue there is thus a warp and a weft that cross one another, as indicated by the traditional symbolism of weaving, according to which the warp threads, vertically hung on the loom of primitive form, represent the permanent essences of things – and so also qualities and essential foms – while the weft, which binds the warp together horizontally and at the same time covers it with its alternating waves, corresponds to the substantial or "material" continuity of the world.[1]

The same law is expressed by the classical hylomorphism, whereby the "form" of a thing or being, seal of its essential unity, is distinguished from its "matter", namely the plastic substance that receives this seal while conferring on it a concrete and limited existence. No modern theory has ever been able to replace this ancient theory, for the fact of reducing the whole plenitude of the real to one or other of its "dimensions" hardly amounts to an explanation of it. Modern science especially ignores what the ancients denoted by the name of "form," precisely because here there is question of a non-quantitative aspect of things, and such ignoring is not unrelated to the fact that this science discerns no criterion in the beauty or ugliness of a phenomenon. The beauty of a thing is the sign of its internal unity, its conformity to an indivisible essence, therefore also to a reality that can neither be counted nor measured.

[1]Rene Guenon, *The Symbolism of the Cross;* chapter on the symbolism of weaving.

It is necessary to point out here that the notion of "form" necessarily includes a twofold meaning. On the one hand, it denotes the delineation of a thing, and this is its most usual connotation; in this respect, form is situated on the side of matter or, more generally, on the side of the plastic substance which, for its part, limits realities and separates them.[2] On the other hand, "form" understood in the sense given it by the Greek philosophers, and after them by the Scholastics, is the association of qualities of a being or thing and therefore the expression or trace of its immutable essence.

The individual world is the "formal" world because it is the realm of realities constituted by the conjunction of a "form" with a "matter," whether subtle or corporeal. It is only in connection with a "matter," or plastic substance, that "form" plays the part of a principle of individuation; in itself, in its ontological basis, it is not an individual reality but an archetype, and as such it lies beyond limitations and beyond change. Thus a species is an archetype, and if it is only manifested by the individuals belonging to it, it is nonetheless as real and indeed incomparably more real than they are. As for the rationalist criticism that tries to prove the absurdity of the doctrine of archetypes by arguing that a multiplication of mental notions would imply a corresponding multiplication of archetypes – leading to the idea of the idea and so forth – it quite misses the point, since multiplicity can in no wise be transposed onto the level of archetypal roots. The latter are differentiated in a principial way, within being and in virtue of it, as if being were a single, homogeneous crystal potentially con-

[2]In Hindu parlance the distinction *nāma-rupa*, "name and form," is attached to the idea in question, "name" here standing for the essence of a being or thing, and "form" for its limited and external existence.

taining all possible crystalline forms whatsoever.[3] Multiplicity and quantity therefore exist only at the level of the "material" reflections of the archetype.

From what we have just said it follows that a species in itself is an immutable "form"; it could not evolve and become transformed into another species, although it can include variants, all these being diverse "projections" of a single essential form from which they will never become detached, just as the branches of a tree never become detached form their trunk.

It has been justly said[4] that the whole thesis of the evolution of species, inaugurated by Darwin, rests on a confusion between species and simple variation. Its advocates present as the start or "bud" of a new species what is really but a variant within the framework of a determinate specific type. This faulty assimilation is, however, insufficient to fill the numberless gaps in the paleontological succession of species; not only are related species separated by profound gaps, but there do not even exist any forms such as would indicate a possible thread uniting different orders like fishes, reptiles, birds, or mammals. One can doubtless find certain fishes using their fins to crawl on a shore, but it is in vain that one would seek among them the least beginning of articulation, which alone would make possible the formation of an arm or paw. Similarly, if certain resemblances exist between reptiles and birds, their respective skeletons nonetheless exhibit a radically different structure. Thus, for example, the very complex articula-

[3]It goes without saying that all the images one can give of the non-separative distinction of the possibilities contained in being remain imperfect and paradoxical.

[4]Douglas Dewar, *The Transformist Illusion* (Murfreesboro, Tenn: Dehoff Publications, 1957). See also Louis Bounoure, *Déterminisme et Finalité,* Collection Philosophie, Flammarion.

tion of its jaws, in a bird, and the connected organization of its hearing apparatus pertains to an entirely different plan from that found in reptiles; it is difficult to conceive how the one might have derived from the other.[5] As for the famous fossil bird *Archaeopteryx*, it is quite certainly a bird, despite the claws at the end of its wings, its teeth, and its long tail.[6]

In order to account for the absence of intermediate forms, the partisans of transformism sometimes have argued that these forms must have disappeared because of their very imperfection and precariousness; but this argument is plainly in contradiction with the principle of selection that is supposed to be the operative factor in the evolution of species. These sketchy attempts should be incomparably more numerous than the ancestors having already acquired a definitive form. Besides, if the evolution of species represents, as is declared, a gradual and continual process, all the real links in the chain – therefore all those that are destined to be followed – will be at the same time resultants and intermediaries, in which case it is difficult to see why the ones would be much more precarious and more destructible than the others.[7]

The more conscientious among modern biologists either reject the transformist theory or else maintain it as a simple "working hypothesis," being unable to conceive any genesis of

[5]Dewar, *The Transformist Illusion*.

[6]*Ibid.*

[7]Teilhard de Chardin (*The Human Phenomenon*) writes on this subject: "Nothing is by nature so delicate and fugitive as a beginning. As long as a zoological group is young, its characteristics remain undecided. Its edifice is tender. Its dimensions are slight. Relatively few individuals compose it, and these are rapidly changing. Both in space and duration, the peduncle (or the bud, which comes to the same thing) of a living branch corresponds to a minimum of differentiation, expansion and resistance. How then is time going to act on this feeble zone? Inevitably by destroying it in its vestiges." This reasoning, which obviously exploits the purely external and conventional analogy between a genealogical "tree" and a real plant, is an example of the "imaginative abstraction" that characterizes this author's thought.

species that would not be situated in the "horizontal line" of a purely physical and temporal becoming. For Jean Rostand:

> The world postulated by transformism is a fairy world, phantasmagoric, surrealistic. The chief point, to which one always returns, is that we have never been present even in a small way at *one* authentic phenomenon of evolution ... we keep the impression that nature today has nothing to offer that might be capable of reducing our embarrassment before the genuinely organic metamorphoses implied in the transformist thesis. We keep the impression that, in the matter of the genesis of species as in that of the genesis of life, the forces that constructed nature are now absent from nature ...[8]

Even so, this biologist sticks to the transformist theory:

> I firmly believe – because I see no means of doing otherwise – that mammals have come from lizards, and lizards from fish; but when I declare and when I think such a thing, I try not to avoid seeing its indigestible enormity and I prefer to leave vague the origin of these scandalous metamorphoses rather than add to their improbability that of a ludicrous interpretation.[9]

All that palaeontology proves to us is that the various animal forms such as are shown by fossils preserved in successive layers of the earth made their appearance in a vaguely ascending order, going from relatively undifferentiated organisms – but not simple ones[10] – to ever more complex forms, without

[8]*Le Figaro Littéraire*, April 20, 1957.

[9]*Ibid.*

[10]The electron microscope has revealed the surprising complexity of functions at work in the interior of a unicellular being.

this ascension representing, however, a univocal and continuous line. It seems to move in jumps; that is to say, whole categories of animals appear at once, without real predecessors. What means this order, then? Simply that on the material plane, the simple or relatively undifferentiated always precedes the complex and differentiated. All "matter" is like a mirror that reflects the activity of the essences by inverting it; that is why the seed comes before the tree and the leaf bud before the flower, whereas in the principial order perfect "forms" preexist. The successive appearance of animal forms according to an ascending hierarchy therefore in no wise proves their continual and cumulative genesis.[11]

On the contrary, that which binds the diverse animal forms to one another is something like a common model, which reveals itself more or less through their structures and which is more apparent in the case of animals endowed with superior consciousness such as birds and mammals. This model is expressed, for instance, in the symmetrical disposition of the body, in the number of extremities and of sensory organs, as also in the general form of the chief internal organs. It might be suggested that the design and number of certain organs and especially those of sensation simply correspond to the terrestrial surroundings, but this argument is reversible, since those surroundings are precisely what the sensory organs grasp and

[11]The most commonly mentioned example in favor of the transformist thesis is the hypothetical genealogy of the equine animals. Charles Deperet criticizes this view in the following terms: "Geological observation establishes in a formal manner that no gradual passage existed between these genera"; the last *Palaeotherium* was extinct long since, without transforming itself, when the first *Architherium* appeared, and the latter had disappeared in its turn, without modification, before being suddenly replaced by the invasion of *Hipparion" (Les Transformations du Monde Animal*, p. 107). To this it can be added that the supposed primitive forms of the horse hardly recur in the equine embryology, though the development of the embryo is commonly regarded as recapitulating the evolution of the species.

delimit. In fact, the model underlying all animal forms establishes the analogy between the microcosm and the macrocosm. Against the background of this common cosmic pattern, the differences between species and the gaps separating the ones from the others are all the more marked.

Instead of "missing links," which the partisans of transformism vainly seek, nature offers us, as if in irony, a large variety of animal forms which, without coming out of the preestablished framework of a species, imitate the appearance and customs of a species, or order foreign to them. Thus, for example, whales are mammals but borrow the aspect and behavior of fishes; hummingbirds have the appearance, the iridescent coloring, the flight, and the mode of feeding associated with butterflies; the armadillo is covered with scales like a reptile while being a mammal, and so on. Most of these animals of imitative form represent superior species that take on the aspect of relatively inferior ones, a fact that excludes a priori our interpreting them as intermediary links of an evolution. As for their interpretation as forms of adaptation to determined surroundings, this seems more than dubious, for what could be, for instance, the intermediate forms between some land mammal or other and the dolphin?[12] Among these "imitative" forms, representing as many extreme cases, we must also include the fossil bird *Archaeopteryx* mentioned above.

Since each animal order represents an archetype that includes the archetypes of its corresponding species, one might well ask oneself whether the existence of "imitative"

[12]On the subject of the hypothetical transmutation of a land animal into the whale, Douglas Dewar wrote: "I have often challenged transformists to describe plausible ancestors situated in the intermediate phases of this supposed transformation" ("What the Animal Fossils Tell Us," Trans. Vict. Inst., Vol. 74).

animal forms does not contradict the immutability of the essential forms; but this is not the case, for the existence of such "mimics" on the contrary demonstrates that immutability by a logical exhausting of all the possibilities inherent in a given type or given essential form. It is as if nature, after bringing forth fishes, reptiles, birds, and mammals with their distinctive characters, wished besides to show that she was able to produce an animal like the dolphin which, while remaining a true mammal, possesses at the same time almost all the faculties of a fish, or a creature like the tortoise, which possesses a skeleton covered in flesh, yet at the same time is enclosed in an external carapace after the fashion of certain mollusks.[13] Thus does nature manifest her protean power, her inexhaustible capacity for generation, even while remaining faithful to the essential forms, which are in fact never blurred.

Each essential form – or each archetype – includes after its own fashion all the others, but without confusion; it is like a mirror reflecting other mirrors, which in turn also reflect it.[14] By its deepest significance the mutual reflection of types is an expression of the metaphysical continuity of existence, or of the unity of being.

Some biologists, in regard to the discontinuity in the paleontological succession of species, postulate an evolution by leaps and in order to render this theory plausible, refer to the sudden mutations observed among certain living species. But these mutations never exceed the limits of an anomaly or a decadence, as, for example, the sudden appearance of

[13]It is significant that the tortoise, whose skeleton seems to indicate an extravagant adaptation to the "armored" state on the part of this animal, appears all at once among fossils, without evolution. Similarly, the spider appears simultaneously with its prey and with its faculty of weaving already developed.

[14]This is the image used by the Sufi 'Abdul-Karīm al-Jīlī in his book *al-Insān al Kāmil*, the chapter on the divine unicity.

albinos or of dwarfs or giants; even when these characteristics incidentally became hereditary, they remain as anomalies and never constitute new specific forms.[15] For this to happen, it would be necessary for the vital substance of an extant species to serve as the "plastic material" for a newly manifested specific form; practically, this means that one or more females of the species qua substance would suddenly bear the fruit of a new species. Now, as was written by the hermetist Richard the Englishman:

> Nothing can be produced from a thing that is not contained in it; by this fact, every species, every genus or every natural order develops within the limits proper to it and bears fruits according to its own kind and not according to an essentially different order; all that receives a seed must be of the same seed.[16]

Basically, the evolutionist thesis is an attempt to replace not "the miracle of creation" but the cosmogonic process – largely supersensual–of which the biblical narrative is a scriptural symbol; evolutionism, by abusively making the greater derive from the less, is the reverse of that process or that "emanation," which, moreover, has nothing in common with the emanationist heresy, since the transcendence and immutability of the ontological principle are here in no wise called in question. In a word, evolutionism results from an incapacity–peculiar to modern science–to conceive "dimensions," of reality other than those of purely physical sequences; to understand the "vertical" genesis of species, it is worth recalling what Guénon said about the progressive solidification of the corporeal state through the various terrestrial eras.[17] This solidification must obviously not be taken to imply that the stones of the earliest ages were soft, for this would be tantamount to saying that certain physical qualities–and in particular hardness and density–were then wanting; what has hardened and become fixed with time is the corporeal state viewed as a whole, with the result that it no longer receives directly the imprint of subtle forms. Assuredly, it cannot become detached from the subtle state, which is its ontological root and by which it is entirely dominated, but the relationship between the two states of existence no longer has the creative character that it possessed at the origin; it is as when a fruit, having reached maturity, becomes surrounded by an ever harder husk and ceases to absorb the sap of the tree. In a cyclic phase where bodily existence had not yet reached this degree of solidication a new specific form could manifest itself directly starting from its first "condensation" in the subtle or "animic" state;[18] that is to say, the different types of animals preexisted at the level immediately above the corporeal world as nonspatial forms but clothed with a certain "matter," that of the subtle world. Thence, these forms "descended" into the corporeal state, 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 animic form.

Indo-Tibetan cosmology describes this descent – which is also a fall – in the case of a human being under the form of the mythological combat of the devas and asuras. The devas having

[15]Bounoure, *Déterminisme et Finalité,* Paris (1957).

[16]Quoted in the *Golden Treatise, Museum Hermeticum* (Frankfurt, 1678).

[17]Guénon, *The Reign of Quantity and the Signs of the Times,* trans. Lord Northbourne, Baltimore (1973).

[18]Concerning the creation of species in a subtle "protomatter" – wherein they still preserve an androgynous form, comparable to a sphere – and their subsequent exteriorization "by crystallization" in sensible matter, heavy, opaque, and mortal, see Frithjof Schuon, *Light on the Ancient Worlds, Chap.* 2, "In the Wake of the Fall," and *Dimensions of Islam* (New York: Fernhill House, Ltd., 1970), Chap. 11, "The Five Divine Presences."

created man with a body that was fluid, protean, and diaphanous – that is to say, in a subtle form – the asuras try to destroy it by a progressive petrifaction; this body becomes opaque, it gets fixed, and its skeleton, overcome by the petrifying process, is immobilized. Then the devas, turning evil into good, create joints after having fractured the bones, and they likewise open the ways of the senses by piercing the skull, which threatens to imprison the seat of the mind. Thus, the solidifying process stops before reaching its extreme limit, and certain organs in man, such as the eye, still keep something of the nature of the noncorporeal states.[19]

In this story, the pictorial description of the subtle world must not be misunderstood. Howbeit, it is certain that the process of materialization, going from supersensory to sensory, had to be reflected within the material or corporeal state itself, so that one is on safe ground in saying that the first generations of a new species did not leave a mark in the great book of earthly layering; it is therefore useless to want to seek in sensible matter the ancestors of a species and especially those of man.

The transformist theory not being founded on any real proof, its corollary and final outcome, namely the thesis of the infrahuman origin of man, remains suspended in the void. The facts put forward in favor of this thesis reduce themselves to a few groups of skeletons of disparate dating. It happens that skeletal types deemed more "evolved," such as the "man of Steinheim," precede others of a seemingly more primitive character, such as the "Neanderthal man," even though this latter example was doubtless not so apelike as tendentious re-

[19]Krasinsky, *Tibetische Medizin-Philosophie.*

constructions would have us believe.[20]

If, instead of always putting the question where humankind begins and what is the degree of evolution of such and such a type counted among prehumans, we were to ask ourselves how far does the monkey go, things might well appear in a very different light, for a fragment from a skeleton, even if it be related to that of man, is hardly enough to establish the presence of that which makes man, namely reason, whereas it is possible to conceive of a great variety of anthropoid apes whose anatomies are more or less close to that of man.

However paradoxical this may seem, the anatomical resemblance between man and the anthropoid apes is precisely explainable by the difference, not gradual but essential, separating man from all the other animals. Since the anthropoid form is able to exist without that "central" element that characterizes man – and that moreover is manifested anatomically by his vertical position, among other things – that form must exist; in other words, there cannot but be found, at the purely animal level, a form that realizes in its own way – that is to say, according to the laws of its own level – the very plan of the human anatomy. It is in this sense that the monkey is a prefiguration of man, not as an evolutionary phase, but in virtue of that law that decrees that at every level of existence analogous possibilities will be found.

One more question arises in the face of the fossils ascribed to primitive men: Did certain of these skeletons belong to men we can look upon as being ancestors of men presently alive, or do they bear witness to the existence of a few groups that survived the cataclysm at the end of terrestrial epoch in order to

[20]In a general way this province of science has been almost smothered by tendentious theories, mystifications, and imprudently popularized discoveries. Cf. Dewar, *The Transformist Illusion.*

disappear in their turn before the arising of our present humanity? Instead of primitive men, it might well be a case of degenerate men, whether these did or did not exist side by side with our real ancestors. We know that the folklore of most peoples speaks of giants or dwarfs who lived long ago, in remote countries; now, among the skeletons in question, several cases of gigantism are to be found.[21]

Lastly, let it once more be recalled that the bodies of the most ancient men have not necessarily left solid traces, either because their bodies were not yet materialized or "solidified" to that point, or else because the spiritual state of those men, conjointly with the cosmic conditions of their time, rendered possible a resorption of the physical "body" into the subtle "body" at the moment of death.[22]

We must now say a few words about a thesis today much in vogue, which claims to be something like a spiritual integration of paleontology, but which in reality is nothing but a purely mental sublimation of the crudest materialism, with all the prejudices this includes, from the belief in an indefinite progress of humanity to a leveling and totalitarian collectivism, without forgetting the cult of the machine that is at the center of all this; it will be apparent that it is about the Teilhardian evolutionism that we intend to speak here.[23]

[21]Like the Meganthrope of Java and the *Gigantopithecus* of China.

[22]In some very exceptional cases – such as Enoch, Elijah, the Virgin Mary – such a resorption took place even in the present terrestrial age.

[23]The materialism of Teilhard is manifest in all its crudity, and also in all its perversity, when that philosopher advocates the use of surgical means in order to accelerate "collective cerebralization" (*The Place of Man in Nature*). Let us also quote some highly revealing words of the same author: "It is finally on the dazzling notion of Progress and on faith in Progress that today's divided Humanity can reform itself .... Act one is played! We have access to the heart of the atom! Now come the next steps, such as the vitalization of matter by the building up of supermolecules, the modeling of the human organism by hormones, the control of heredity and of the sexes by the play of genes and chromosomes, and the readjustment and liberation by direct action of the springs laid bare by psychoanalysis; the awakening and captation of intellectual and affective forces still slumbering in the human mass" (*Planete* III, 1944, p. 30). Quite naturally Teilhard proposes the fashioning of mankind by a universal scientific government – in short, all that is required for the reign of Antichrist.

According to Teilhard de Chardin, who hardly worries over the gaps inherent in the evolutionist system and largely banks on the climate created by the premature popularization of the transformist thesis, man himself would only represent an intermediate stage of an evolution starting with unicellular organisms and ending up in a sort of global cosmic entity, in union with God. The craze for trying to bring everything back to a single univocal and uninterrupted genetic line here exceeds the material plane and launches out wildly into an irresponsible and avid "mentalization," characterized by an abstraction clothed in artificial images which their author ends up by taking literally, as if it were a case of concrete realities. We have already mentioned the imaginary genealogical tree of species, of which the supposed unity is but a snare, being made up by the hypothetical conjunction of many disjointed elements. Teilhard amplifies this notion to his heart's content, in a manner that is purely graphic, by completing its branches–or "scale," as he prefers to call them–and by constructing its pinnacle in the direction of which humankind would supposedly be situated. By a similar sliding of thought from abstract to concrete, from figuration to what is deemed real, he agglutinates, in one and the same pseudoscientific sprouting, the most diverse realities such as mechanical laws, vital forces, psychic elements, and spiritual entities. Let us quote a characteristic passage:

> That which explains the biological revolution caused by the apparition of Man, is an explosion of consciousness; and

> that which, in its turn, explains this explosion of consciousness, is simply the passage of a privileged radius of "corpusculization," that is to say of a zoological phylum, across the surface, hitherto impermeable, separating the zone of direct Psychism from that of reflected Psychism. Having reached, following this particular ray, a critical point of arrangement (or, as we say here, of enrollment) life became hypercentered on itself, to the point of being capable of foresight and invention ...[24]

Thus "corpusculization" (which is a physical process) would have as its effect that "a zoological phylum" (which is only a figure) passed across the surface (purely hypothetical) separating two psychic zones ... but one must not be surprised at this absence of *distinguo* in Teilhard's thinking, since according to his own theory, the spirit is but a metamorphosis of matter!

Without stopping to discuss the strange theology of this author, for whom God himself evolves with matter, and without daring to define what he thinks of the prophets and sages of antiquity and other "underdeveloped" beings of this kind, we will say the following: If man, under the double relationship of his physical nature and his spritual nature, were really nothing but a phase of an evolution going from the amoeba to the superman, how could he know objectively where he stands in all this? Let us suppose that this alleged evolution forms a curve, say a spiral. The man who is but a fragment thereof – and let it not be forgotten that a "fragment" of a movement is but a phase of that movement – can that man step out of it and say to himself: I am the fragment of a spiral developing in such and such a way? Now, it is certain – and Teilhard de

[24]*La Place de l'Homme dans la Nature*, p. 84.

Chardin recognizes this moreover – that man is able to judge of his own state. In effect he knows his own rank amid other terrestrial beings; he is even alone in knowing objectively both himself and the world. Far from being a simple phase in an indefinite evolution, man represents essentially a central possibility, unique therefore, irreplaceable and definitive. If the human species had to evolve toward another more perfect and more "spiritual" form, man would not already now be the "point of intersection" of the divine spirit with the terrestrial plane; he would neither be capable of salvation nor intellectually able to surmount the flux of becoming. To express these thoughts according to the Gospel perspective: Would God have become man if the form of the latter were not virtually "god on earth," that is to say, qualitatively central as well as definitive in relation to his own cosmic level?

As a symptom of our time, Teilhardism is comparable to one of those cracks that are due to the very solidification of the mental carapace,[25] and that do not open upward, toward the heaven of true and transcendent unity, but downward toward the realm of the inferior psychism. Weary of its own discontinuous vision of the world, the materialist mind lets itself slide toward a false continuity or unity, toward a pseudospiritual intoxication, of which this falsified and materialized faith – or this sublimated materialism – that we have just described marks a phase of particular significance.

[25]Guénon, *The Reign of Quantity and the Signs of the Times*, Chap. *XV*, "The Illusion of 'Ordinary Life'."