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## **GENESIS AND CREATION: TOWARDS A DEBATE**

REVIEW ARTICLE: Seraphim Rose, *Genesis, Creation and Early Man: The Orthodox Christian Vision* (St Herman of Alaska Brotherhood, Platina, California: 2000), 709 pages.

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The overall theme of this book can be stated fairly simply: Because it is not possible to prove or disprove evolution by science, it is a theological problem. Genesis, the true word of God, is properly interpreted only by the Church Fathers who are unanimous in that Genesis not only leaves no room for evolution but is absolutely contrary to it. Christian evolutionists, who try to reconcile Genesis with evolution, do not understand the Fathers and fail to appreciate that evolution is not science but atheistic philosophy. They are seduced by fashionable ideas and are afraid to be thought backward by the modern world. The only alternative to a literal understanding of Genesis is atheism.

This seemingly simple thesis raises a number of theological questions; furthermore, the treatment of the subject demands review and correction of almost all of what is presented as science in this book.

Aspects of this thesis are here developed in various writings of Fr Seraphim Rose, liberally supplemented by even more trenchant additions from his editor, Hieromonk Damascene, who enthusiastically assumes the role of Rose's bulldog. The contents include lectures on the patristic interpretation of Genesis; notes and lectures under the heading "The philosophy of evolution"; a lengthy response to Dr Alexander Kalomiros; answers to questions, notes, and excerpts from letters. Given the composite nature of the book,

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compiled some 20 years after Fr Seraphim's death, it is not surprising that it is quite repetitive.

### ***How do we read the Fathers?***

The selection from patristic commentaries on the creation and fall stories contains much valuable material; Fr Seraphim is right to stress the importance of appreciating the broad picture of what the Fathers are trying to say, rather than taking excerpts out of context. The Editor notes that Fr Seraphim became rather bored with having to present patristic teaching on creation exclusively

as it relates to evolution (35); this “boredom” is the reader’s gain, because it means that this section is somewhat less polemical than the rest of the book. Even so, there is a distinct difference in emphasis and tone between a patristic treatise on Genesis and Fr Seraphim’s compilation. The Fathers assume that Genesis has a basis in historical fact, but seem primarily interested in what it tells us about God’s ways and His relationship with His creatures; in Fr Seraphim’s commentary, the literal interpretation becomes the main point.

Beyond presenting us with a selection of patristic thought, Fr Seraphim forces us to confront hard questions about the way we read patristic commentaries on Scripture. For him, there is no difficulty: we read the Scriptures as the Fathers direct us, since “the Fathers link the ancient text with today’s reality’ (72). But do they? Or do they themselves need interpreting? The Editor underlines Fr Seraphim’s desire to *acquire the mind of the Fathers* (23, his emphasis), rather than simply becoming a scholar specializing in their writings; and the repeated implication is that this “mind” can only lead us to accept all aspects of the Fathers’ interpretation, except for a few trivial details. But where does this leave other theologians of our day, such as Fr Georges Florovsky or Bishop Kallistos Ware, who have not felt obliged to follow the Fathers’ literal understanding of the creation story? Must we write off as delusion their dedication to recovering the mind of the Fathers as “an existential attitude and a spiritual orientation” (Florovsky, “Patristic Theology and the Ethos of the Orthodox Church”) and “re-experiencing the meaning

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of Tradition in a manner that is exploratory, courageous and full of imaginative curiosity’ (Ware, *The Orthodox Church*)? Is it so indisputably clear how the patristic attitude is to be applied to today’s world? We are told (34) that Fr Seraphim originally thought of titling a book such as the present one “...An Orthodox View’; but the subtitle eventually chosen is “*The Orthodox Christian Vision.*” Therein lies one of the main problems with this book.

Fr Seraphim is commendably honest in recognizing that if one believes, as he does, that we must read Genesis exactly as the Fathers did, one is then committed to a thorough-going young earth creationism, however much contrary evidence there may appear to be. It is therefore a little surprising that he is so unreservedly commended in the Introduction by Phillip Johnson, author of *Darwin on Trial*, etc. Johnson is “gratified” that Fr Seraphim’s presentation of the Fathers “has thoroughly demolished one of the favorite canards of accommodationists” (50); he does not seem to mind that it has equally “demolished” any notion of “intelligently designed” life forms coming into being after the Six Days.

Precisely because Fr Seraphim’s approach is fundamentally honest and his arguments usually precise and coherent—at least as regards the patristic sources—it is very important to recognize his presuppositions. Fundamental to his entire case is the premise that evolution, and any other scientific theory antithetical to young earth creationism, constitutes philosophy rather than

science: we will return to this later. Closely allied to this premise is the assertion that evolution is “Clearly” of the same order as views about the cosmos current in St Basil’s time that were rejected by that Father (285).

The latter premise does much to explain why Fr Seraphim, for all his emphasis on taking the Fathers in context and on their own terms, does not always avoid enlisting them in modern battles-in effect, interpreting them in terms of our own context. An example is his use of Gregory of Nyssa’s comments on transmigration of souls, a teaching which Fr Seraphim characterizes as “a strange parallel with the modern theory of universal evolution” (138). Strange, indeed. Gregory sees reincarnation as amounting to a belief that “one single

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nature runs through all beings” (139), which, according to Fr Seraphim, “lies at the heart of the theory of universal evolution”; but he is making the debatable assumption that “nature” means the same thing for St Gregory of Nyssa and for Erasmus Darwin. Evolution can hardly be said to “blend and confuse hopelessly all the marks by which one could be distinguished from another,” as the Saint continues *apropos* of reincarnation. One might further note that St Gregory, while rejecting any “blending and confusion,” strongly affirms a certain connection between all material creatures; consider his notion of man as a mingling of the intelligible and the sensible “so that one grace of a sort might equally pervade the whole creation, *the lower nature (sic)* being mingled with the supramundane” (*Great Catechism*, 6). Would it be any more arbitrary to see in this a “strange parallel” with the physical connectedness between living things which we now recognize, and for which evolution provides a neat explanation?

### ***Reading the Fathers— Principles and their application***

The commentary section of the book begins with some principles on how to understand both Genesis and the Holy Fathers. These are for the most part very wise; but as is so often the case, the problem is how these principles themselves are to be understood and applied. We are warned, for instance, that “we should carefully distinguish [the Fathers’] science from their theological statements” (83). This distinction is very important to Fr Seraphim, because it allows him to disagree with the Fathers when their teaching conflicts with facts that one cannot avoid accepting as such. But it is dubious whether the distinction was so clear cut in the Fathers’ own minds; consider the liberal doses of cosmology in St John of Damascus’ *On the Orthodox Faith* or St Gregory Palamas’ *Topics of Natural and Theological Science*. Furthermore, theological statements are not made in a vacuum. Especially when the Fathers are touching on theological cosmology, as in interpretation of the creation accounts, it is not always a straightforward matter to discern how far presuppositions inherited from the science of their day have shaped the way they formulate their theological insights.

For example, Fr Seraphim rightly stresses that “the idea of the consistency of nature and the integrity and distinctiveness of its “kinds” runs throughout patristic literature” (138). Earlier, he has characterized St Basil as teaching that “the ‘kinds’ of Genesis (except, of course, for those that may have become extinct) maintain their nature to the end of time” (134). But there is no “of course” about the exception. St Basil does indeed remark that reeds produce reeds rather than olives, eagles produce eagles: and the most ardent proponent of evolution would hardly disagree. But he is just as adamant that “no length of time causes the specific characteristics of the animals to be corrupted or go extinct...” (135). Chrysostom, incidentally, says even more explicitly that not a single race of animal has suffered diminution; God’s blessing and command to multiply bestowed this permanence upon them (*On Genesis*, Hom. 7.4). Is this science or theology? Quoting the same passage from St Basil again elsewhere, Fr Seraphim is explicit: it is “a statement not of science but of philosophy” (334). Now, many readers will see it as quite legitimate to accept the Fathers’ “philosophical” positions while rejecting as factually inaccurate some of the assumptions that contributed to their conclusions. That, indeed, is what “Christian evolutionists” try to do; but it is questionable how far this approach is consistent with the line Fr Seraphim takes everywhere else in the book, where the specifics of the Fathers’ interpretation of Genesis appear to determine what we can accept in modern science. To be sure, the question of whether some creatures have gone extinct is not of the highest importance; but it does highlight a problem with Fr Seraphim’s approach. If one is trying to “think as the Fathers thought, surely it is relevant to ask whether St Basil would have considered his belief in the survival of all the “kinds” any more negotiable than the belief in their consistent distinctiveness on which Fr Seraphim places such weight.

Or does he? Fr Seraphim not only affirms that “anything genuinely true in Scripture cannot contradict anything that is genuinely true in science” (82, cf. 417); he also makes the striking admission that “if it were really a *scientific fact* that one kind of creature can be

transformed into another kind, I would have no difficulty believing it, since God can do anything...” (388, emphasis in the original). Leaving aside the question of whether “one kind of creature being transformed into another kind” is an accurate characterization of the process of evolution as generally understood, one is entitled to ask: where does this leave the Fathers’ inspired interpretation of Moses’ inspired text? If one accepts that notions such as the immutability of kinds can be jettisoned in the face of “scientific fact,” how can they serve as an

argument against entertaining the possibility that an evolutionary explanation of the data might be “factual”?

In his response to Dr Kalomiros, Fr Seraphim adds a further “basic principle of interpreting the writings of the Holy Fathers,” and one that is crucial to the picture he builds up: “*When they are giving the teaching of the Church, the Holy Fathers (if only they are genuine Holy Fathers...) do not contradict each other...*” (406, cf. 85; emphasis in original). The one practical problem with this principle is that it is doubly tautological: a genuine Holy Father is by definition someone who expresses the teaching of the Church, and anyone who is truly expressing the teaching of the Church will necessarily be in agreement with others who do likewise. The interesting question is how one then deals with apparent contradictions, particularly relating to details concerning creation. Fr Seraphim invokes the above principle to justify explaining them away. But he does not make clear the criterion for determining whether the premise of this principle is valid—whether in a given case a Holy Father is indeed expressing the teaching of the Church, rather than his private opinion. When Fathers appear to contradict one another, what prevents us from concluding that they actually do disagree, and hence that the question at issue is not in fact a matter on which the Church has a precisely defined teaching?

#### ***Answering the questions raised by evolution?***

In Fr Seraphim's view, which he (and, *a fortiori*, his editor) hammers home relentlessly throughout the book, we are faced with a stark choice: do we accept the Holy Fathers, or “modern wisdom”?

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This epitomises an approach which many readers will see as missing the point. Fr Seraphim is firmly convinced that “*the doctrine of evolution was invented... to account for the universe on the assumption that God either does not exist or is incapable of creating in six days or bringing the world into existence by His mere word*” (44 1, emphasis original), and that Christians accept it only because they have fallen into the latter two of those assumptions. This quite fails to recognize that many Christians accept evolution for a reason of quite a different order: that while God is perfectly capable of creating everything in six days, the weight of evidence suggests that in point of fact He did not. In this light, arguments from the incorruption of Christ's birth to the incorruption of the newly created world (cf. 418-19) becomes irrelevant. So does the insistence that the six days of creation lie outside the reach of science. No one is suggesting that science can tell us about a period when the laws of nature as we know them did not apply, in which everything came into being in its present form within six days in a state of incorruption; they are pointing to strong circumstantial evidence for species coming into being at a time when death already reigned and the laws of fallen nature were well in place.

Fr Seraphim quite rightly points to the nature of paradise and the question of corruption and mortality as some of the most intractable anthropological and cosmological questions raised by the modern scientific understanding of the history of the earth (cf. 216); nor is he wholly unfair in regarding as unsatisfactory most attempts on the part of Orthodox theologians to address them. So when he promises that, in the patristic commentary on Genesis, “the most pressing questions raised by the doctrine of evolution will be answered for us” (376), the reader may have high hopes. They are likely to be dashed, however, because Fr Seraphim’s answer” is to rule such questions out of order.

Even without the complicating factor of evolution, we might consider Fr Seraphim a little optimistic in speaking of a “precise and coherent doctrine” (376) when it comes to the nature of the world before the Fall. For example, Fr Seraphim’s insistence on the

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original immortality of animals (410ff.) is not easily reconciled with Gregory of Nyssa’s interpretation of the “garments of skin” as the “capacity for dying which had been foreseen as being the special attribute of the animal creation” (*Great Catechism*, 8). Perhaps more significant, Fr Seraphim insists-with some justification that when the Fathers formally disagree as to whether man was immortal by nature or by grace (438ff), they are simply talking about two aspects of the same reality; and he distinguishes their view sharply from Aquinas’ doctrine that the immortality of Adam was based on a supernatural force in his soul-a doctrine Fr Seraphim considers “quite compatible with the idea of evolution” (447). He fails to explain, however, what we are to make of St Athanasius’ very explicit insistence that Adam fell into a state *according to nature* in becoming corruptible and subject to death. St Athanasius is certainly not saying that what is *natural* was meant to be *normal*; but that is rather a different question. Mortality and nature would appear to go hand in hand.

### ***The nature of the Fathers’ authority***

Although Fr Seraphim states that “we can actually know rather little about the details of the Creation of the Six Days” (100), he seems to have supreme confidence in the precision of “that *knowledge* of the first and last things which God has revealed to His chosen people, the Orthodox Christians” (376). It is not always easy to share this confidence. Consider, for instance, Fr Seraphim’s discussion of the location of paradise. It is fair enough to point out that we too readily divide things into “spirit vs. matter” and therefore have difficulty understanding how the Fathers speak of paradise as both geographical and spiritual; but he resists any notion that the Fathers’ view of its physical aspect might be inextricably bound up with the admitted limits of their geographical knowledge. Commenting on Chrysostom’s literal interpretation of the four rivers of paradise, and noting that these rivers as we know them today have four different sources, he has recourse to radical changes in geography brought about by the Flood. The only

problem with the invocation of this trusty workhorse among cataclysms is the testimony of St Gregory of Sinai, who,

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as Fr Seraphim tells us, speaks from first-hand experience, having visited paradise in a state of divine vision (166): the Saint speaks of Eden, complete with rivers, in the present tense, as a reality at once spiritual and sensible (*On Commandments and Doctrines*, 10; Fr Seraphim quotes from this passage, but omits the rivers).

The purpose of raising this point is not to disparage the spiritual authority of St Gregory of Sinai, or any other Father of the Church, but to question Fr Seraphim's understanding of their divine inspiration. Noting that St Gregory of Sinai includes contemplation of the composition of visible things among the "eight primary visions," Fr Seraphim concludes that "the Holy Fathers of the highest spiritual life beheld the first-created world in the state of divine vision, which is beyond all natural knowledge" (416). Fr Seraphim's consistent rendering of *theoria* as "vision" rather than "contemplation" reinforces the impression that the Fathers enjoy a hot line to spiritual knowledge about the creation of the world *not mediated through their own human understanding and frame of reference*. But is this actually what we affirm when we claim the Fathers as spiritual and theological authorities? It is far from apparent from the Fathers' own writings, however, that they would claim for themselves this degree of assurance; one thinks of St Gregory the Theologian's qualification "whatever that paradise may have been," or his tentative interpretation of the tree and the garments of skin (*On Theophany* 12); or indeed St Ambrose resorting to allegory of the animals in paradise (*On Paradise*, 11; quoted p. 180). Notwithstanding St Basil's appeal to hear what God says "in person and without riddles" (*Hexaemeron* 6. 1, quoted p. 100), his brother speaks of Moses setting forth teachings "in the guise of history and in riddles" (*Great Catechism*, 8). Are the Fathers giving us the last word—or contributing to an understanding which we must then bring to bear on problems quite foreign to them?

### ***Christian evolutionists***

There is a whole chapter on "Christian evolutionism," (a term that is placed in quotes throughout the chapter), which, polemical enough as it is, to some is outside the bounds of civil discourse in

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that it is permeated by *ad hominem* "guilt-by-association" insinuations. Here, the thesis that evolution is a Divinely supervised creative process is rejected, partly on the grounds that the

“philosophy” of evolution is atheistic, partly because it contradicts the Patristic understanding of Genesis, and partly because it is deistic! A number of Christian evolutionists, not all Orthodox, are reviewed. Although it is the Jesuit Teilhard de Chardin who is excoriated as “a prophet of Antichrist” (369), Orthodox writers Panagiotis Trempeles (340-341), Father Anthony Kosturos (345-46), Theodosius Dobzhansky (351-54) and our own Fr John Meyendorff (373, 375) are singled out for criticism. Because we were unable to gain access to the cited writings of these authors, we cannot judge to what extent the criticism is justified. However, in fairness to Fr John Meyendorff, it should be stated that he had a nuanced view of evolution which did not include evolution by natural selection.

Some Christians, who recognize the weight of scientific evidence supporting the Theory of Evolution, have pointed to the understanding in some of the Fathers of instantaneous creation of everything in potential *in the beginning*. This idea is found in St Ephrem (112-13), St Basil, St Ambrose, St Gregory of Nyssa, St Augustine, and in St Bede. What follows the creation of these potentialities is not so much the addition of new things but rather a kind of separation by the creative Word of God of creatures from already created matter. It is a calling forth into being of the potentialities that are already present. Fr Seraphim sees this (113) as “rather a ‘shaping’ than a ‘creation’ in the strict sense,” but he does not stop to consider the implications. Apart from this brief explanation of St Ephrem’s text, the only other reference to this potentially challenging insight is passing and dismissive (54 1).

### ***What is science?***

For all his insistence on abandoning worldly wisdom, Fr Seraphim recognizes that there are certain data (e.g. the fossil record, DNA analysis, and biogeography), which require some explanation in the light of a literal reading of Genesis. For this, he appeals to “creation

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science” that is presented as evolution’s scientific alternative. Hence at this point, it is well to clarify what science is. What follows is the view of a practicing scientist who has spent a lifetime working with the geological and fossil records.

Science is one kind of humanity’s intellectual response to the material world (= the visible creation), a language about a certain kind of human experience. Science seeks naturalistic and orderly relationships among phenomena and it is self-correcting, that is explanations and relationships inferred are falsifiable. This last means that it is possible to imagine circumstances which, if true, would show explanations and theories to be false. Science involves three activities: description of objects and phenomena; construction of explanatory relationships (theories) among objects and phenomena; and testing to establish confidence among observations and theories.

The fundamental assumptions of science as it is generally understood are twofold: first, that the material world is real, not an illusion; second, that the world is ordered. These assumptions are fully in accord with the Christian faith. First, the Church holds that the material world is real. To argue otherwise is to argue that the Incarnation is an illusion; the Church insists on the reality of the Incarnation. Secondly, the Church holds that Creation is ordered. Furthermore, study of the visible creation helps us to see the Creator through His Creation because "...since the Creation of the world His invisible attributes are clearly seen, being understood by the things that are made, even His eternal Power and Godhead..." (Rom 1:20). Nevertheless, the Church in Her Wisdom neither endorses nor rejects scientific theories.

Because science seeks naturalistic explanations, its *methodology* is materialistic. In this sense, it is reductionist. But this means that God is beyond the reach of science so that science can neither prove nor disprove the existence of God, a point that resonates with Dionysius the Areopagite. In this view, science falls short of being a world-view."

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### ***Fr Seraphim Rose's understanding of science***

The understanding of science presented above is substantially different from that of Fr Seraphim. He does not spell out explicitly what he means by science but the closest he comes to doing so is when he agrees (382) with one of his interlocutors that "You must not confuse *pure science* with the different theories written to *explain* the facts discovered by science. Facts are one thing (pure science) and explanations of facts is another (philosophy)." Later, when alluding to the evidence for evolution, he dismisses the scientific evidence (but not the evidence presented by "creation scientists") asserting that the philosophical presuppositions in the light of which the scientific facts are grouped are the sole basis of evolution. This strongly suggests that he confines science to the gathering of data, whether observational or experimental, and the construction of explanations (theories) he considers to be philosophy. It is perfectly proper for him to restrict his definition of science in this way, so long as he makes this quite explicit, but it is still an eccentric understanding of science. His lack of clarity in this regard can only confuse the unwary reader, particularly one who understands what science and philosophy are in the generally received sense.

### ***Evolution: Fact or Theory?***

Is evolution a fact or a theory? A fact is something that can be seen and verified by any competent observer. It is a fact that you are reading this review. A theory, on the other hand, is something seen in the mind, a human construct. The Ptolemaic (geocentric) universe is a scientific theory but it was replaced by the Copernican (heliocentric) because the latter is able to explain the movements and the phases of the inner planets more simply. The Theory of Evolution

holds that all living things are descended from a common ancestor as a result of the accumulation of change through geological time. It is not concerned with the origin of life, or with the origin of the universe. In common with all scientific theories, it is based on evidence and has explanatory power. But in common

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with all scientific theories, it is tentative. This means that it can be modified in the light of new knowledge or even superseded by a better theory.

Fr Seraphim states (511-12): "...the argument against the supposed 'scientific' theory of evolution is not in itself scientific, for 'science' itself can never prove nor disprove it... the argument against it is theological." That science as well as "creation science, "that is presented in the book as the scientific alternative to evolution, cannot prove or disprove evolution is in an important sense true. The question is: what is meant by "prove"? It is only in mathematics, a science that deals with abstract relationships, that it is possible to demonstrate absolute proof, proof in the sense that the theorem demonstrates that the result is implicit in the initial premises. We can call this verification. In the sciences of the "real," verification in this sense is not possible but falsification, already discussed, is possible. In principle, therefore, it is possible to disprove evolution but in practice it would now be difficult to do so because there is a vast body of different kinds of scientific data that support it. Fr Seraphim, and indeed anybody, is free to reject an evolutionary interpretation of these data but at the same time should recognize that there are vast numbers of people, familiar with the data, who find no other satisfactory way to interpret the data.

It is certainly fair to ask what would falsify the Theory of Evolution. For instance, Evolution would be falsified, or at least placed in considerable doubt, if a segment of any accepted ancestor-descendent lineage were found in strata older than strata containing the earliest differentiated member of that lineage. An example might make this clearer. The standard evolutionary interpretation of the human fossil record is that humans descended from some ape-like ancestor which, in turn, descended from earlier, more primitive primates. All primates occur in strata that are younger than strata with dinosaurs. The standard picture would be placed in doubt, to say the least, if, in addition to the primate fossil record as described, genuine human fossils were found in strata with dinosaurs, or in even still older strata. Should this ever happen, it would mean that

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the earliest primates could not possibly be ancestral to humans and hence the standard sequence through apes is irrelevant to the origin of Man.

### ***The Theory of Evolution vs. Evolutionary Theory***

It is important to appreciate that Evolutionary Theory is not the same as the Theory of Evolution, a distinction that “creation scientists” and their constituency by and large fail to make. Evolutionary Theory is concerned with *how* evolution occurs. The current, most widely accepted, theory is Neo-Darwinism and is the subject of vigorous debate on the part of scientists but this debate is not about the Theory of Evolution. For instance, one question being debated is whether or not the gradualism that is a feature of Darwinism (properly speaking, this term refers to the theory as presented by Darwin in “The Origin of Species,” and it is not a blanket term for all evolutionary theories) is adequate to produce the diversity of life we see. In other words, is there some other process, some kind of macroevolution, some kind of saltation, perhaps something like Goldschmidt’s “Hopeful monsters” that Fr Seraphim cites (468)? Macroevolution, supported by some, and Punctuated Equilibria, also supported by some, would each be non-Darwinian because each is non-gradualistic.

### ***The science of evolution and the metaphysical baggage added to it***

The Neo-Darwinian as well as non-Darwinian evolutionary theories have an internal logic and all the appearance of an adequate explanation. Although an *adequate* explanation is not necessarily a *complete* explanation, atheist materialists, whether scientists or not, have welcomed the science of evolution and have added heavy metaphysical baggage to it. Fr Seraphim seems to understand this when he states (340) “...there is nothing in the evolutionary view of the world in itself which requires it to be atheistic...” What this means is not entirely clear because Fr Seraphim and Heiromonk Damascene persist throughout the book to characterize evolution as philosophy, atheistic to boot. Indeed, it is this package of science

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with materialistic metaphysics grafted to it that many see as Evolution. In this package, the science claims that all living things are descended from a common ancestor as a result of the accumulation of change over geological time and the metaphysics claims that as the science provides an adequate explanation, it follows that there is no need for Laplace’s “God-hypothesis.” This, of course, depends on the validity or otherwise of the assumption that all truth can be discovered by application of the scientific method. This goes beyond science and is properly speaking *scientism*. We find that typically the advocates of scientism have the most primitive understanding of religion.

***“Creation science”***

Fr Seraphim's critique of evolution appears in his chapter, "A Brief Critique of the Evolutionary Model," as well as in his answers to students' questions and in his letters. For his understanding of evolution and the substance of his critique, Fr Seraphim relies heavily, perhaps unwittingly, on the "creation science" literature. So do Phillip Johnson and Heiromonk Damascene, the other contributors to this book.

There are many reasons why this reliance presents a distorted picture of the scientific side of the questions addressed in the book. First, because "creation scientists" present their "creation model" as a scientific model, it must stand or fall on the basis of scientific evidence. However, they have done very little original scientific work of their own in support of the "creation model." Just about the only exception is their "Flood Geology" which we will examine later.

The main activities of "creation scientists" attempt to disprove evolution by finding inconsistencies and contradictions in the scientific literature. In the view of "creation scientists," falsification of the "evolution model" would establish the "creation model." Here they make a serious philosophical error because it is possible that a third, so-far unknown, "model" could replace the "evolution model." Hence, the "creation model" cannot be established simply by falsifying the "evolution model." Perhaps they would heed Phillip

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Johnson: "Exposing Darwinism [*sic*] to possible falsification would not imply support for any other theory, certainly not any pseudoscientific theory based upon a religious dogma." (*Darwin on Trial*, 156). What scientific evidence would be required to support the "creation model" is not easy to specify. But in the scientific context, the "evolution model" holds that species appearing for the first time in the fossil record have ancestors. In contrast, the "creation model" holds that each "kind" (a term never defined taxonomically) is a "special creation" without ancestors and that there are no intermediate forms. It is true that many organisms appear in the fossil record abruptly, with no ancestor species in the immediately underlying strata. But this absence may be due to poor fossilization potential, either in the organisms or in the sedimentary environment, or alternatively, the ancestors may have been physically absent from the area, being confined to areas more or less adjacent. If so, the appearance of an organism in an area from which ancestors were absent would be due to migration, driven by environmental shift, from another area. "Creation scientists" might consider these possibilities and they would have a much stronger case if they could develop a research agenda to resolve this question. Such work would have the potential of yielding valuable scientific insights, quite apart from the metaphysical presuppositions it seeks to prove.

Secondly, much of the "creation science" literature is of poor quality and misleading. The "creationist" objections ("evidence against evolution") have been answered by a number of scientists and philosophers such as, more recently, Kenneth Miller and Philip Kitcher. Hence,

although there is no point in responding to every creationist objection yet again, it is instructive to examine a few examples of the kind of thing seen in the “creationist” literature. Page 306 provides sufficient examples both in Fr Seraphim’s text and Hieromonk Damascene’s footnotes. With regard to the modern coelacanth, Heiromonk Damascene quotes Phillip Johnson: “...it’s [sic] internal organs showed no signs of being pre-adapted for a land environment...” It is true that its “lung” is not used for gas exchange but for fat storage instead but this is hardly

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relevant to the argument because the modern coelacanth (*Latimeria*) lives in deep-water, just above the ocean floor, and its adaptation is to that habitat. It is a survivor, a relict form, that continues to eke out a living in the deep-water environment. In contrast, the fossil coelacanths that are interpreted as being close to the ancestors of amphibians are found in strata deposited in fresh-water continental environments similiar to those inhabited by modern air-breathing fish.

With regard to *Archaeopteryx*, Heiromonk Damascene quotes from Henry Morris that *Archaeopteryx* is a “mosaic form [which] possessed no transitional *structures*.” *Archaeopteryx* really is a mosaic of undoubted reptilian and undoubted avian features. Its skeleton is reptilian, the details of which suggest that it was almost certainly a glider rather than a flapper, and it has been stated quite reasonably that if there never had been any birds, *Archaeopteryx* would have been classified as a rather eccentric reptile. What Morris presumably means by “no transitional structures” becomes a little clearer in the statement found on the same page that Gould and Eldredge “acknowledge that curious mosaics like *archaeopteryx* [sic] do not count as smooth intermediates...” Reference to Gould and Eldredge’s original text shows they are saying that gradualism between basic body-plans, that is gradualistic transition of all structures in lock-step, is not a feature of the fossil record. As *Archaeopteryx* is a mosaic, it cannot be cited as an example of this gradualistic transition in lock-step. Perhaps these are relatively trivial matters which “creation scientists” could clear up when they do some genuine scientific work of their own.

### ***The “Young Earth” theme***

Readers will soon discover that there is one “creation science” theme that is of profound importance to the agenda of the book. This is the age of the Earth. Clearly, if the Earth is young, only a few thousand years old, there is insufficient time for the diversity of life we see to-day to have evolved. Except for the “day-age” creationists, “creation scientists” themselves admit that if they can undermine

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the “old-earth assumption,” evolution itself would fall. To this end, as readers will note, they reject uniformitarianism and favor catastrophism.

In the “young Earth” theme, there are three “creation science” sub-themes that are of fundamental importance to this cause: rejection of the principle of uniformitarianism in favor of catastrophism; rejection of the geological time scale on the supposed grounds that it is based on the *a priori* assumption of evolution of organisms now represented by fossils; and rejection of radiometric dating on the grounds that it is based on uniformitarianism and other unfounded assumptions.

In the latter part of the eighteenth and the first couple of decades or so of the nineteenth century, the fossil record was seen in terms of a doctrine, later called Catastrophism, that held that the history of the Earth was generally quiescent, not very different from present conditions, but was punctuated by a number of revolutions that caused local extinctions followed by repopulation by intercontinental migration. It was thought that these revolutions must have been sudden and that no presently observable process could account for them. The latest revolution was transformed into the Noachian Flood by William Buckland (1784-1856), an ordained member of the Church of England. In time, doubts were raised as to the universal nature of the deposits supposed to be the products of the Noachian Flood because they are largely confined to the northern latitudes. They were later shown to be the products of a number of discrete and locally restricted glacial events. We shall return to this topic later, in connection with Flood Geology.

Catastrophism was gradually replaced by the Principle of Uniformitarianism, the fundamental interpretive principle in reading the geological and fossil records. Encapsulated by Sir Archibald Geikie (1835-1924) as “the present is the key to the past,” uniformitarianism is commonly attributed to James Hutton (1726-1797) with later development by Charles Lyell (1797-1875). The passage from Lyell quoted by Fr Seraphim (298) presents uniformitarianism as gradualistic. But there are two kinds of uniform-

itarianism: Lyell's version which specifies that processes acted in the past at the same rate as to-day (this is called substantive uniformitarianism); and another that leaves rates open (this is methodological uniformitarianism) and which may correspond to some form of neo-catastrophism. Most contemporary geologists understand uniformitarianism as methodological uniformitarianism.

Uniformitarianism is an assumption, but is it a reasonable assumption? For example, the study of soft sediments forming at present in various environments has yielded modern analogues of sedimentary features that are seen in various kinds of sedimentary rocks. For instance, modern

sand-dunes show large-scale cross-bedding like that seen on sandstones which are, on this basis, interpreted as fossil sand-dunes.

The authors reject uniformitarianism (see especially pp. 163, 585) but it is instructive to examine Paley's famous "watchmaker" argument favored by "creation scientists," the scenario about finding a watch and knowing that it had a designer. How would one know this? One would know this only if one had seen one or more watches that one knew by observation or reputation had a designer. In other words, the conclusion that the watch had a designer depends on prior knowledge that similar objects are not naturally occurring but had a designer. Failing this prior knowledge, one could quite legitimately conclude that the watch is a rather odd natural object. The methodology here is precisely the same as the methodology of uniformitarianism. In both cases, there is the analogy inferred between the object or objects of known origin and the historical object examined.

Finally, it is ironic that St Basil uses something remarkably like the principle of uniformitarianism:

The command was given...not even in mud and marshes did the water remain idle; it took its part in creation. Everywhere from its ebullition frogs, gnats and flies came forth. For that which we see to-day is the sign of the past. Thus everywhere the water hastened to obey the Creator's command. (Hexaemeron: VII, 1)

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Turning now to the second sub-theme, that the geological time scale is based on an *a priori* assumption of evolution, Fr Seraphim quotes (3 10) from W.B.N. Berry's "Growth of a Prehistoric Time Scale":

Evolution thus is the very basis of the geologic time scale although the scale itself was erected before Darwin and Wallace presented their principle of natural selection to the scientific world.

As far as it goes, this sentence is accurately quoted. But it is the second sentence of a two-sentence paragraph. The first sentence reads:

The succession of faunas and floras seen in the rocks of the earth's crust is the product of several factors of which the most important is the evolution of organisms through natural selection.

If these are read consecutively, as written, it becomes clear that Berry is saying that the geological time scale is based on a succession of faunas and floras, their succession (what is seen in the strata) being to an important extent the product of evolution.

The removal of Berry's statement from its context makes him say something quite different from what he is really saying and it is this sort of distortion that is made to support the "creation science" notions that the geological time scale is based on the assumption of evolution. What this is supposed to mean is that the stratigraphic order of fossil-bearing strata is somehow based on an *a priori* assumption placing the faunas and floras in evolutionary sequence so that strata containing organisms considered as primitive would have to be the oldest and strata containing successively more advanced organisms would have to be successively younger. This allegation is simply not true in any sense. The historic fact is that the order of stratigraphic succession of faunas and floras has been determined on the basis of superposition. Thus, the underlying strata, being older, enclose the older faunas and floras, and correspondingly, successively overlying strata enclose successively younger faunas and floras. This is quite simply based on empirical fact and does not rely in the remotest way on any understanding of evo-

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lutionary relationships among the organisms. The same principle would apply if the lowest strata contained purple marbles, the next overlying paper clips, and the uppermost beer bottles. Because nobody would seriously suggest that purple marbles evolved into paper clips, and these into beer bottles, a supposed evolutionary basis may be eliminated. A chronological succession (purple marbles [oldest]-paper clips-beer bottles [youngest]) is derived strictly and exclusively from the superpositional relationships of the strata containing the named objects. Fr Seraphim and Heiromonk Damascene (311) are unequivocally wrong when they claim that the establishment of the order of faunas and floras in the geological strata involves circular reasoning.

With regard to the third sub-theme, the book includes, as one of its appendices, a critique of radiometric dating by Curt Sewell, an electronic engineer. In addition to repeating the error that the geological time-scale is based on the "assumption of evolution," Sewell (633) states that "without this foundational belief [uniformitarianism], all the various long-age dating measurements would be meaningless." Uniformitarianism enters radiometric dating in postulating that radioactive decay rates are constant. But this is more p than a matter of faith. Radioactive decay is proof against external influences because it is controlled by forces that are vastly more effective at short atomic distances than forces working in physicochemical reactions. In fact, attempts have been made to modify these rates under various physical and chemical conditions but with no success.

Sewell acknowledges the several radioactive decay sequences used for dating but denies that the application of multiple decay sequences to the same sample gives concordant ages. This is not true. The concordance of such ages is quite remarkable.

This so-called critique of radiometric dating is nothing other than a digest of the “creation science” literature on radiometric dating and is made up almost entirely of distortions and fantasy. It badly damages the credibility of those sections of the book that deal with science.

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### ***Flood geology***

As mentioned earlier, about the only genuine scientific work done by the “creation scientists” is Flood Geology. This interprets almost all of the geological strata as the product of the Noachian Flood. The idea that any part of the geological strata was formed by the Noachian Flood was considered and rejected in the early years of the 19th century by geologists, most of whom believed that species are immutable. Many of these geologists were ordained members of the Anglican Church.

It should be noted that Flood Geology has a different scope from the earlier “catastrophism” that interpreted the relatively recent sands, gravels, and boulders, now known to be of glacial origin, as products of the Noachian deluge. In “Flood geology” terms, these deposits are post-Flood but it is virtually all the fossiliferous strata underlying the glacial deposits that are considered to be products of the Noachian Flood. In scientific terms, this means all strata from the upper part of the Proterozoic to the onset of glaciation at the end of the Cenozoic.

“Creation scientists” have cited the conglomerates (fossil gravels) and coarse sandstones as evidence of deposition from fast-flowing water but there are also enormous thicknesses of strikingly uniform fine-grained finely-laminated deposits traceable over vast distances that could only have been deposited under quiescent conditions. Furthermore, there are lots of strata with trace fossils (trails, burrows, etc.) which are formed on stable sea-floor. As trace fossils would be destroyed by the erosion of the sediment holding them, their presence in the stratigraphic record can only indicate quiescent conditions with episodic deposition of sediment.

There is an order in the succession of faunas and floras found in the fossiliferous strata and, in this connection, it is worth reminding ourselves that this order is not based on any *a priori* assumptions about the evolutionary positions of the faunas and floras but entirely on the superpositional order of the strata containing them.

If, as Fr Seraphim insists, all living creatures were created in a six-

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day period, the fossil record should show just one more or less homogeneous assemblage of organisms throughout, from the oldest layers to the newest. However, this is not the case at all: there is a definite order, a successional replacement of assemblages hardly supportive of a literal six-day creation period. In common with all young earth” creationists, Fr Seraphim has a problem which he solves to his satisfaction by invoking science, or rather “creation science.” The explanation of this order is “Flood Geology.”

The “Flood Geology” explanation offered is that the order seen in the strata reflects the order in which the bodies of creatures were buried. Three explanatory factors are proposed for this sorting: (1) Habitat: Creatures living at lower elevations would be buried first (i.e. in lower strata) than those living at higher elevations; (2) Hydraulic properties: Some, the thinner ones, would be more easily suspended in the water, sinking more slowly and would therefore be buried after the more globular; (3) Mobility: The more active, mobile animals would climb to higher elevations to escape the rising waters and would be buried by the upper layers.

While it is generally true that the earliest fossil faunas consist largely of bottom-dwellers, the fossil record as a whole cannot be explained in terms of Flood Geology. Here are some stumbling blocks: (a) Bottom-dwellers are found at all levels; (b) Modern bony fish (teleosts) are found only in higher layers and are entirely absent from older layers that contain primitive jawless fish, primitive jawed fish, sharks and primitive bony fish; (c) Whales and dolphins occur only at higher levels while similar sized marine reptiles are confined to lower strata; (d) Ground sloths appear in the highest layers while more agile animals such as horses and carnivores occur in lower layers; (e) Birds have a good fossil record well below the highest strata. They should be confined to the highest when presumably the flood waters had covered all available perches that could have been used as refuges. However, pterodactyls are confined to older strata. (f) Large mammals occur in strata younger than those to which dinosaurs are confined. (g) Although marine invertebrates occur throughout the range of fossiliferous strata,

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there is a clear succession of invertebrate assemblages: There is an assemblage with trilobites in the lower levels, one with ammonites above, and finally one dominated by snails and clams. Furthermore, if one considers families, genera and species rather than larger groups, there is a similar kind of distribution, a similar non-repeating order, but on a finer scale.

Before leaving “Flood Geology,” it is instructive to identify the interpretive principles used by “creation scientists” in formulating the “Flood Geology model.” First, they recognize that fossils are the remains of once-living organisms. Second, they recognize that the superpositional succession of layers represents a chronological succession. Third, they recognize that coarse sands and gravels had been deposited from fast-moving water. All three have been determined, if not by “creation scientists” then by others, by the application of the principle of

uniformitarianism. The point here is that catastrophes (by this is meant non-gradualistic events such as volcanic eruptions and tsunamis) can be recognised in the geological record only by the application of uniformitarianism. "Flood Geology" is therefore uniformitarian and according to the criteria articulated by Fr Seraphim and Heiromonk Damascene, it has to be philosophy, not science.

### ***Epilogue***

Leaving aside Fr Seraphim Rose for the moment, it hardly needs to be stated that in the United States fundamentalist evangelical Christians are trying to introduce the teaching of "creation science" into the schools as an alternative to "evolution science." Despite an appeal to fairness, in other contexts creationists adopt an either/or position, that it is either special creation or evolution, no other view being possible. Some Orthodox even think that the Orthodox Church should join creationists in their efforts, oblivious of the fact that the Church does not endorse or condemn scientific theories and that the fundamentalist evangelical understanding of the Bible is quite different from that of the Orthodox Church.

But if we reject the position of the fundamentalist evangelicals,

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we must equally critically examine the position of its counterpart: scientism, already noted earlier. It is ironic that each, in claiming that the other is the only alternative, authenticates the other. Each, using the same criterion, science, claims that science proves/disproves the truth of the Bible. Each is a form of fundamentalism and is foreign to the Orthodox Church.

Nevertheless, many are troubled by the question of evolution, and concern is often expressed that Orthodox young adults are exposed to science as a World-view, opposed to a Christian Worldview. The problem here is the either/or position adopted by evangelical fundamentalists and Fr Seraphim Rose as well as by atheists. Someone taking good, non-doctrinaire courses in Biology or Geology would most likely recognize that there is, *pace* Fr Seraphim, a great deal of evidence supporting evolution. Given an either/or mind-set the result is hardly surprising. There is, indeed, a parallel situation in the former Communist countries where evolution is seen as Marxist and hence anathema.

What is the remedy? An essential component of the remedy is the recognition that the evolutionary package as presented by Dawkins and others includes a great deal of metaphysical baggage, as explained earlier. It is also important to bear in mind that a non-deistic God continues to work in and through his Creation. Evolution, seen in this light, is subsumed to a theistic World-view and can be regarded as God's chosen way of creation.

Returning now to Fr Seraphim Rose, his book, whatever its shortcomings, represents the views of a more or less clearly defined Orthodox constituency and in this it is valuable. These views deserve to be heard along with other views articulated by Orthodox. The book raises many questions and these questions are theological. They need to be addressed seriously in ongoing debate but not with the objective of securing a verdict, one way or the other, on the validity of a scientific theory.

Some of the questions that suggest themselves can be stated here. What is the authority of the Fathers? To what extent are the Fathers infallible? Is it legitimate to interpret the Fathers in the light of later

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experience? In this connection, dare one point out that the Fathers, especially the early Fathers, did carry on a conversation, often heated, with the world and that Holy Tradition is not a museum but is dynamic? Furthermore, is everything in the Fathers of equal authority, of equal weight? Thus, where the Fathers seem to disagree, is it possible that there is no defined doctrine on this matter? It may also prove to be fruitful to develop the implications of the creation of everything in potential *in the beginning*.