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Dear Attendee,

Thank you for taking the time to write to me about these very important questions. I understand that you are strongly committed to maintaining a seriously devout approach to the Bible, not letting things drop with the latest fashion. I remember your question (at least I suspect you are the one who had a question at the end of my talk) the same one at the end of this letter, but one which you did not fully express at the time.

Let me begin with this question and then turn to the geologic column, the question of miracles, and the Pontifical Biblical Commission.

### *Scientific method*

Scientific method relies on observation, measurement, and experiment. Observation and experiment, indeed, may be viewed as types of measurement, and with improvements in technology, measurements can be made increasingly exact. In this context, things that are long past, or things which are deep in space, have sometimes been argued not to be proper subjects of science: nobody was -- or nobody can be -- there to observe, and the materials do not fit into a test tube or any other sort of apparatus appropriate to experiments, so the study is not scientific!

Since this would put the entire sciences of astronomy and paleontology outside the proper realm of scientific discourse, it is important to resolve this issue.

There are several ways that ideas about the physical world can be considered in an experimental manner.

First, even when we cannot observe an entire process, such as the very slow formation of a fossil, we can often observe and measure the individual parts of the process. We can watch how minerals behave in solution, how they deposit themselves, how one mineral exchanges itself for another in a solution. We can look at oceans and at their lagoons, and also at mineral pools and at drying lakes, so that we see how stronger concentrations of minerals behave. In these ways, we can observe the individual parts of a process which we believe to have occurred, and we can know whether such a process is possible, probable, or even, given the chemistry and physics of a situation, practically inevitable.

Thus, even when we cannot observe an entire process from start to finish, we can observe whether the parts of that process are able to happen, and how fast they can or will happen in specific circumstances. This is the kind of thing that puts historical processes within the purview of scientific research.

Similarly, we cannot put a supernova into a test tube, nor, indeed, can we put any star into any lab, for they are too large. Traveling to the stars for research is not practical, because even if we had the time and resources, stars are just too hot to get near enough for anything like the lab experiments that we use for microbes or even for lightning.

Nevertheless, the light of stars is right here, right now, and we are able to analyze that light to discover a wealth of information -- what is burning, first of all. Once we know what is burning, we have an immediate line on the temperature of the star, because different elements fuse and burn at different temperatures.

We can also find the distance to an increasing number of stars, and this, along with their brightness and chemical composition, allows us to figure out their size. In such ways and in many others, astronomy is able to take its place as a science, even though experimenting with stars as such is, as you know, out of the question.

Turning to the question of semi-meiosis, John Davison's hypothesis, let me begin with a brief disclaimer:

It is a hypothesis.

Since he was pushed out of his job, Davison was not able to experiment in the ways he desired and thus it was not possible to move from hypothesis to theory.

Nevertheless, I believe his hypothesis is worth knowing first of all because it illustrates that there is a viable option for explaining the origin of one species from another. Furthermore, this option is surprisingly attractive and answers many, perhaps all, of the objections that naturally arise with respect to classical Darwinism, and even neo-Darwinism. From the point of view of paleontology and the geologic column, for example, it would readily explain why there is always a jump in the fossil record, never a completely smooth transition from one species to the next. From the point of view of comparative genomes, it would take account of the change in chromosome number which is gradually being established as the difference between species of the same genus. This concept is not very familiar, but it goes back 50 years, and is, rather quietly, being researched. So this is another line of important research.

From the point of view of Catholic philosophy, semi-meiosis would entirely close the question of polygenism. There would be no question of a race of primates "gradually" developing humanity. They might get taller, stand straighter, pull their thumbs around, or drop their larynxes, perhaps; I don't know. But there would be only a single generation, only a single moment, at which they dropped their chromosome number, (from 24 pairs to 23 pairs) and this would happen to the offspring of one female, and all the new offspring would be the new species with a species barrier against copulation with the ancestral species.

This is a very important matter, because it is the gradual process, the polygenism, that implies racism.

To what extent can we observe this process?

Certainly we can observe the individual steps involved in this process.

For example, we can observe parthenogenesis. If we observe it carefully, we can learn precisely what happens, because we actually don't understand it very well. It's there, but there has perhaps been no reason to study it all that fully. It is possible to stimulate eggs electrically and cause parthenogenesis, so we can make this a subject of research. That would be helpful.

It is also possible, as you know, to splice genes into the chromosome of a creature, and thus change the offspring. We have done this in many cases; it is now the standard procedure for genetically modified plants. This is another research avenue that can be pursued, asking ourselves what are the limits of that modification?

Another line of research would study the specific differences between the chromosomes of species that seem to be closely related. To put it most simply, we might represent the genes on one of the chromosomes of a species as letters of the alphabet: ABCDEFG. If another species of the same genus had, on the analogous chromosome the letters: BACDEFG, we could easily see that only two had exchanged places. We could experiment and see whether it was possible to make that exchange in the lab.

Now, in fact, differences between existing creatures are very complex. I don't mean to make it sound so simple that one thinks it could easily have been done. I only mean that each of the parts of the

hypothesis can be tested.

If all the parts of the hypothesis were tested, and if the total theory was in harmony with the genome and the geologic record, that would move it from hypothesis to theory, and that would be very exciting. It can only happen if people are able to do research, however.

## ***Geology***

You express doubt that the geologic column really indicates anything about age. I respectfully submit that it has strong indications. The most useful source on this is the work of Glen Morton, because he started out as a creationist, and it was his work in the field that led him to abandon his young-earth ideas. He has written an extended description of the Williston Basin, and it is available online. It is a bit technical, so you may need some help reading it, but there's just nothing better. A little patience will be very rewarding.

The semester that I taught geology here in South Dakota, I made a simplified version of his description, and if that is of interest to you, it is part of my book *A Doorway of Amethyst*, which you can purchase online. Two of the most persuasive sections of this basin are the salt deposits and the Minnelusa Formation. Whatever else might happen, flat or sideways, the laying down of 300 feet of salt during a flood must be viewed as most improbable. The Minnelusa is a different issue; I encourage you to pursue an understanding of this matter so that you see why it is incompatible with the idea of all sediments being laid down in Noah's Flood.

It is true, particularly of sandstones, that many forms must have been buried in local landslides or other sudden events. In the coal, it is different.

I do not think that anyone is completely clear about the way the petrified trees were preserved in those locations where their roots are intact, but not their branches. Those dating from the Triassic may have been involved in whatever cataclysm brought the Paleozoic to an end and initiated the Mesozoic. Volcanic covering seems to have been involved, and this would have provided a strong mineral solution in the context of local flooding. That might have sufficed. Keep in mind that geologists are not averse to recognizing cataclysmic events, only to attributing everything to a single cataclysm when there are obvious explanations in slow processes, or especially when there is evidence of a slow process, such as dessication cracks, which imply the drying of one sedimentary layer before the next layer is added.

## ***A word about miracles***

To express the doubt that events of no particular spiritual importance are not likely to be miraculous is not to doubt that miracles occur. I was once at a dinner where chicken was multiplied, just as Jesus multiplied loaves and fishes. I was once in the room when someone who had "hiccups" from brain damage just stopped hicking when one of the members of the prayer group laid hands on him. I believe that Jesus performed miracles, and that many saints did, and that God expects us to see a few in our own day.

But we cannot say that a miracle is really demonstrative in a scientific sense, because it is particular, and it cannot be produced on demand like a natural event that science discovers. I mean, I can show you how acid makes egg coagulate any day of the week, but my multiplied chicken is just something I saw. I can't make it happen again with someone to measure the chicken before and after and in everyone's gut just to be sure. One eyewitness is never enough. Even a hundred eyewitnesses from long ago are not always enough.

Still, I do believe that there have been and still are miracles. I just don't think it likely that each new species was created miraculously; I believe that such an event belongs to the natural world and that we should expect to find a natural explanation. Even if the explanation points to design, the mechanical aspect may not require miraculous intervention.

We have so much to learn about God's ways, please do not impute a spiritual doubt just because you cannot imagine my thoughts. I believe in God.

Your concern with the 1909 document remains to be addressed. So I turn to that.

### ***Pontifical Biblical Commission***

You have provided an introductory statement to the effect that anyone who contradicts this document is subject to the charge of disobedience. Disobedience. This is itself very revealing. Disobedience is the sin we commit when we disobey the rules. It is serious, but it is not heresy. Do you understand the difference? Pius X said we had to keep the rules; he did not say that we had to maintain each opinion as if it were dogma. This is not a dogmatic statement but a disciplinary statement. So it is fair to ask whether that rule still applies.

Here are the 8 questions in order:

Question I: Whether the various exegetical systems which have been proposed to exclude the literal historical sense of the three first chapters of the Book of Genesis, and have been defended by the pretense of science, are sustained by a solid foundation? -- Reply: In the negative.

**In other words, is Darwinism solidly scientific? It is not. Fine.**

Question II: Whether, when the nature and historical form of the Book of Genesis does not oppose, because of the peculiar connections of the three first chapters with each other and with the following chapters, because of the manifold testimony of the Old and New Testaments; because of the almost unanimous opinion of the Holy Fathers, and because of the traditional sense which, transmitted from the Israelite people, the Church always held, it can be taught that the three aforesaid chapters of Genesis do not contain the stories of events which really happened, that is, which correspond with objective reality and historical truth; but are either accounts celebrated in fable drawn from the mythologies and cosmogonies of ancient peoples and adapted by a holy writer to monotheistic doctrine, after expurgating any error of polytheism; or allegories and symbols, devoid of a basis of objective reality, set forth under the guise of history to inculcate religious and philosophical truths; or, finally, legends, historical in part and fictitious in part, composed freely for the instruction and edification of souls? -- Reply: In the negative to both parts.

**In other words, may the first chapters of Genesis be treated merely as a nice and instructive fable? It may not. Fine.**

Question III: Whether in particular the literal and historical sense can be called into question, where it is a matter of facts related in the same chapters, which pertain to the foundation of the Christian religion; for example, among others, the creation of all things wrought by God in the beginning of time; the special creation of man; the formation of the first woman from the first man; the oneness of the human race; the original happiness of our first parents in the state of justice, integrity, and immortality; the command given to man by God to prove his obedience; the transgression of the divine command through the devil's persuasion under the guise of a serpent; the casting of our first parents out of that first state of innocence; and also the promise of a future restorer? -- Reply: In the negative

**In other words, can various things *which are foundational to the Christian faith*, and which are presented in Genesis 1-3 as facts, be called into question? The answer is no, and among the several examples given are:**

- 1) the special creation of Adam,
- 2) the creation of Eve from Adam, and
- 3) the oneness of the human race.

In this case, let me point out that from the perspective of Darwinism, these three examples are one, and are rejected in the single stroke or polygenism. From the perspective of semi-meiosis, they are distinct questions and I will take them one by one:

1) the creation of Adam is special in the sense that he is a specific person, not the metaphorical name for a process over an indefinite number of generations.

2) The creation of Eve is not from Adam's rib, but it is from the same genome. Thus, Eve does not descend from a separate race, as is, for example, suggested in the story called Clan of the Cave Bear, which is, I assume, based on some sort of Darwinism hypothesis. Furthermore, the rib as the enclosure of the breath and heart suggests that Eve was made to be the wife of Adam, and this concept is retained in semi-meiosis.

On the other hand, the making of a woman from the differentiated body cells of a man would involve several miracles more than were obvious either to the sacred writer or to the Biblical Commission of 1909, before the genome was understood. Of course, with God all things are possible; nevertheless, the call to faith is always a call to believe something specific and of value in relation to our salvation. We now recognize that, had God used Adam's body cells to make Eve, he would have had to change each cell, first to remove the Y chromosomes, and then to enable the specialized tissues which are locked out once tissues are specialized for lungs. All this is not about salvation, and, in the context of the semi-meiotic hypothesis, it cannot be considered foundational to our faith. The equal humanity of Eve with Adam, and the equal humanity of all their children is assured. That is foundational.

3) The oneness of the human race is absolutely upheld in the semi-meiotic hypothesis.

Question IV: Whether in interpreting those passages of these chapters, which the Fathers and Doctors have understood differently, but concerning which they have not taught anything certain and definite, it is permitted, while preserving the judgment of the Church and keeping the analogy of faith, to follow and defend that opinion which everyone has wisely approved? -- Reply: In the affirmative

In other words, may one defend a position which is generally accepted, even if it isn't traditional, so long as it does not contradict things which have been defined, and so long as one is open to the Church, to the Magisterium, as the last word? One may. So this amounts to a permission, an openness, though qualified. *Nota bene!*

Question V: Whether all and everything, namely, words and phrases which occur in the aforementioned chapters, are always and necessarily to be accepted in a special sense, so that there may be no deviation from this, even when the expressions themselves manifestly appear to have been taken improperly, or metaphorically or anthropomorphically, and either reason prohibits holding the proper sense, or necessity forces its abandonment? -- Reply: In the negative.

In other words, do we have to accept a particular and most literal interpretation even if it is clearly unintended and unreasonable? We do not. *Nota bene!* Reason is not to be set aside.

Question VI: Whether, presupposing the literal and historical sense, the allegorical and prophetic interpretation of some passages of the same chapters, with the example of the Holy Fathers and the Church herself showing the way, can be wisely and profitably applied? -- Reply: In the affirmative

In other words, may the allegorical interpretation be applied when the literal and historical sense is accepted? Yes, of course! Taking something literally doesn't prevent us from taking it allegorically as well; indeed the whole of poetry and of language itself is an exercise in going from the literal to the metaphorical and allegorical.

Question VII: Whether, since in writing the first chapter of Genesis it was not the mind of the sacred author to teach in a scientific manner the detailed constitution of visible things and the complete order of creation, but rather to give his people a popular notion, according as the common speech of the times went, accommodated to the understanding and capacity of men, the propriety of scientific language is to be investigated exactly and always in the interpretation of these? -- Reply: In the negative.

In other words, given that Genesis was not written as a science text, *must* it be read as one? The answer is no. *Nota bene!* This implies a genuine and unambiguous respect for the proper application of science.

Question VIII: Whether in that designation and distinction of six days, with which the account of the first chapter of Genesis deals, the word (dies) can be assumed either in its proper sense as a natural day, or in the improper sense of a certain space of time; and whether with regard to such a question there can be free disagreement among exegetes? -- Reply: In the affirmative

In other words, with regard to the literal meaning of the word “day” in Genesis 1, may there be a free disagreement among exegetes? There may. *Nota bene!* The requirement to take “day” literally had already been already abandoned in 1909.

So that’s all. Only question #3 even raises a possible issue; the rest is either in harmony with the semi-meiotic hypothesis or in harmony with the basic issue of being respectful about the proper domain of science.

With respect to #3, I think that if John Paul II said that evolution should be respected as a theory, and if the 1909 document is disciplinary rather than dogmatic, then the discipline must be understood to have been lifted. The only other interpretation would be that he was in error.

Thank you again for coming to my talk, and for writing to me afterwards. I have posted my talk -- well, not my talk, but the essay I wrote while planning my talk. It is posted on line at my web site, [www.hedgeschool.com](http://www.hedgeschool.com). I would like to add some portion of your letter, if I may. Would you like me to use your name? I will not use your name without your permission.

I have a new grandchild since I spoke in New Jersey. He is very healthy and beautiful, and I got to be there for the birth.