

posed of 100 amino acid residues is about one chance in  $10^{65}$  per try.<sup>9</sup> The maximum number of individual organisms from all species ever existent on Earth is far less than  $10^{50}$  individual organisms.<sup>10</sup> Every step of naturalistic macroevolution must be accounted for with fewer than  $10^{50}$  tries, but  $10^{50}$  tries fails to be enough for the probable naturalistic assembly of even one gene coding for a small, integrated, functional, complex enzyme. Naturalistic macroevolution is an extremely irrational scientific hypothesis.

Since naturalistic macroevolution is a scientific hypothesis, which lacks unique and unequivocal scientific data and which is extremely irrational, it should be excluded from all scientific curricula.

### Notes

<sup>1</sup>The Westminster Confession of Faith, "Of God's Eternal Decree," chap. III, no. 1.

<sup>2</sup>Prov. 16:33.

<sup>3</sup>H. J. Van Till, "Is the ID Movement Capable of Defeating Naturalism? A Response to Madden and Discher," *Perspectives on Science and Christian Faith* 56, no. 4 (Dec. 2004): 292.

<sup>4</sup>The Westminster Confession of Faith, "Of Providence," chap. V, no. 1. 5Ps. 139:13.

<sup>6</sup>Exod. 4:11.

<sup>7</sup>Col. 1:17; and Heb. 1:3.

<sup>8</sup>Van Till, "Is the ID Movement Capable of Defeating Naturalism?" 292.

<sup>9</sup>H. P. Yockey, "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory," *Journal of Theoretical Biology* 67 (1997): 387; and J. F. Reidhaar-Olson and R. T. Sauer, "Functionally Acceptable Substitutions in Two  $\alpha$ -Helical Regions of  $\lambda$  Repressor," *Proteins: Structure, Function, and Genetics* 7, no. 4 (1990): 315.

<sup>10</sup>A total of fewer than  $10^{50}$  individual organisms from all species have existed on Earth over the past 3.5 billion years. *E. coli* are about 2 microns in length and 0.2 microns in diameter. With the multiple filamentous structures, a single organism has a volume greater than 0.25 cubic microns. A cubic meter contains  $10^{18}$  cubic microns. Less than  $4 \times 10^{18}$  *E. coli* could be stacked into one cubic meter. A collection of  $10^{50}$  *E. coli* would fill a volume greater than  $2.5 \times 10^{31}$  cubic meters. Earth contains less than  $1.5 \times 10^{18}$  cubic meters of water. A volume of  $2.5 \times 10^{31}$  cubic meters is  $1.666 \times 10^{13}$  times the volume of Earth's water. A collection of  $10^{50}$  *E. coli* could fill 100% of all bodies of water on Earth every day for more than 45 billion years, which is some nine times the age of Earth and three times the age of the universe. As a corollary of interest, a total of fewer than  $10^{50}$  individual organisms from all species have existed on Earth over the past 3.5 billion years.

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### Stem Cell Research: Critiques and Views

I would like to comment to David Siemens' recent letter (*PSCF* 56, no. 4 [December 2004]: 309) critiquing Kristyn Mannoia's "An Evaluation of Three Religious Perspectives on Stem Cell Research" (*PSCF* 56, no. 3 [September 2004]: 216-25). Our ASA area discussion group, which meets periodically to discuss *PSCF* articles, thought Ms. Mannoia's article was excellent. We did not find her arguments foolish, though Timothy Chen said her portrayal of the various positions could have been more nuanced.

Siemens begins by pointing out contra Stanley Hauerwas that "following our intuitions is not an adequate basis for moral standards." Fair enough, but

Mannoia does not say they are. Her reference to intuitions occurs within the larger context of the Wesleyan Quadrilateral and, as she says, "illuminates one facet of truth." Intuition "may suggest that embryos are indeed persons." She makes no other claim for them.

Siemens then attacks Gilbert Meilaender's argument that a person is someone who has a history. This argument, Mannoia says, can be applied to the zygote since it too has a history. Siemens counters that lots of impersonal things have histories. That is true, but the question is one of values, and it is also true that we frequently value impersonal things because of the history attached to them. If we do not value the zygote, it is because we do not value its history, but not valuing its history is the first step in devaluing its personhood. I suspect Mannoia means no more than this.

In this regard, Siemens points out that a large percentage of fertilized ova do not implant. Well, so what? Lots of other people meet tragic deaths. But perhaps a fertilized ova is no person until it implants, or until it reaches a certain stage of development. We simply do not know, so, since we do not know, Siemens' argument is only suggestive, not conclusive.

The same cannot be said of Siemens' reference to Caiaphas' prophecy in relation to personal choice. Caiaphas did not give himself for a sacrifice, he simply—and ignorantly—proclaimed the purposes of God. Therefore Siemens' appeal to the passage has no bearing on the argument addressed.

While it may be true that an ovum stimulated in the right way can produce a viable human being (the reality of Turner females suggests this, something neither Mannoia or Siemens mentions), it is also true that a fertilized egg is the first step to a fully formed human being. Trying to avoid that fact by an appeal to stimulated ova is irrelevant.

Nor does Siemens' attempt to qualify the testimony of the church fathers pass muster. They may not have known precisely when pregnancy occurred, but they spoke in one voice in defense of the unborn when they knew it had occurred.

Siemens then pounces on Mannoia's point that "hES research involves something conceived in the womb." That is ridiculous, he says, since hES uses ova acquired through *in vitro* fertilization. Apparently everyone but Siemens snoozed past that one! Or did they? Since *in vitro* fertilization was unknown until the late twentieth century, the early church would not have addressed it. Plainly Mannoia is trying to apply the principle that a fertilized ovum is the first step toward a fully developed human being to the current situation, and, until very recently, such an ovum would only have been conceived in the womb.

Mannoia purposed to apply Ian Barbour's work to the question of stem cell research. I think she did a credible job. Indeed for an undergraduate she did a remarkable job. I also think it is a shame that David Siemens missed it.

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