Reading Guide 12

Specified complexity

For this class, we are reading Dembski [1998], Meyer [2009, pp. 215–224], and Stenger [2007], all of which are available on the class website. In the first of these readings, Dembski introduces his idea of "specified complexity," and explains how he uses it to draw inferences about intelligent design. He does not provide an application, however. For that, we go to the chapter by Meyer. Finally, Stenger's article provides a critique of these ideas.

12.1 Dembski [1998]: Science and design

1. What does Dembski mean by complexity? By specification?
2. Dembski agrees that if selection operates with reference to a goal, then it can produce specified complexity. But natural selection has no goal, and for this reason cannot generate specified complexity. Would you agree? Why or why not?

12.2 Meyer [2009, pp. 215–224]: Beyond the reach of chance

Meyer considers the probability that a particular protein, consisting of 150 amino acids, might evolve by random chance. There are 20 kinds of amino acid, so the number of possible proteins of this length is

$$\overbrace{20 \times 20 \times \cdots \times 20}^{\text{150 times}} = 20^{150} \approx 10^{195}.$$

In an apparent typo, Meyer puts this number at 10^{164}. No matter—you end up with the same conclusion either way.

1. Let us assume that Meyer is right about the three constants—10^{80}, 10^{17}, and 10^{43}. Does the product, 10^{140} of these three seem like a sensible upper bound on the number of events that have ever happened in the history of the universe?
2. Let's also accept that there are 10^{164} possible proteins of length 150. Would you agree with him that a fraction $1/10^{164}$ of these are "functional?"
3. Dembski uses the example of the archer to illustrate the right and wrong way to test hypotheses. If the archer hits a small target, that suggests he is a good shot. But if he draws the

target around the arrow after it lands, it tells us nothing at all. Which of these procedures has Meyer used in the protein example?

4. Describe the "chance" hypothesis, which Meyer rejects. Is it a fair characterization of evolution?

5. Is "intelligent design" the only plausible alternative to "pure chance?"

6. What is new about this argument, compared with that of [Murphy, 1866, col. 3], which we discussed last week?

12.3 Stenger [2007]: Physics, cosmology, and the new creationism

We will focus on pages 131–142, which deal with the ideas of William Dembski. We'll skip the remainder (pp. 142–148), which is about the origin of the universe and the so-called "anthropic coincidences." These latter topics do not involve evolution, so they are outside the scope of this course.

Dembski uses a statistical theory of information, which he attributes to Claude Shannon [1948]. As Stenger explains, Dembski's theory is somewhat different.

Before reading Stenger, look at my notes on information theory, which you'll find on the class web site. (Feel free to stop reading when you get to the math.) I'll lecture about this in class.

1. Under what circumstances is Dembski information the same as Shannon information?

2. Dembski defines what he calls the "Law of Conservation of Information," which holds that "the number of bits of information cannot change in any natural process such as chance or the operation of some physical law" [Stenger, 2007, p. 135]. On pp. 138–139, Stenger refutes this law by inventing an imaginary counterexample, involving magnets. How does Stenger's argument work? Is it fair? Convincing?

Bibliography

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