

Intelligent Design is not Optimal Design

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I was recently on an NPR program with skeptic Michael Shermer and paleontologist Donald Prothero to discuss intelligent design. As the discussion unfolded, it became clear that they were using the phrase "intelligent design" in a way quite different from how the emerging intelligent design community is using it.

The confusion centered on what the adjective "intelligent" is doing in the phrase "intelligent design." "Intelligent," after all, can mean nothing more than being the result of an intelligent agent, even one who acts stupidly. On the other hand, it can mean that an intelligent agent acted with skill, mastery, and éclat. Shermer and Prothero understood the "intelligent" in "intelligent design" to mean the latter, and thus presumed that intelligent design must entail optimal design. The intelligent design community, on the other hand, means the former and thus separates intelligent design from questions of optimality.

But why then place the adjective "intelligent" in front of the noun "design"? Doesn't design already include the idea of intelligent agency, so that juxtaposing the two becomes an exercise in redundancy? Not at all. *Intelligent design* needs to be distinguished from *apparent design* on the one hand and *optimal design* on the other. Apparent design looks designed but really isn't. Optimal design is perfect design and hence cannot exist except in an idealized realm (sometimes called a "Platonic heaven"). Apparent and optimal design empty design of all practical significance.

A common strategy of opponents to design in biology (like Stephen Jay Gould, [Richard Dawkins](#), and Francisco Ayala) is to assimilate intelligent design to one of these categories--apparent or optimal design. The problem with this move is that it constitutes an evasion. Indeed, it utterly sidesteps the question of intelligent, or actual, design. The automobiles that roll off the assembly plants in Detroit are intelligently designed in the sense that human intelligences are responsible for them. Nevertheless, even if we think Detroit manufactures the best cars in the world, it would still be wrong to say they are optimally designed. Nor is it correct to say that they are only apparently designed.

Within biology, intelligent design holds that a designing intelligence is indispensable for explaining the specified complexity of living systems. Nevertheless, taken strictly as a scientific theory, intelligent design refuses to speculate about the nature of this designing intelligence. Whereas optimal design demands a perfectionistic, anal-retentive designer who has to get everything just right, intelligent design fits our ordinary experience of design, which is always conditioned by the needs of a situation and therefore always falls short of some idealized global optimum.

No real designer attempts optimality in the sense of attaining perfect design. Indeed, there is no such thing as perfect design. Real designers strive for *constrained optimization*, which is something completely different. As Henry Petroski, an engineer and historian at Duke, aptly remarks in *Invention by Design*: "All design involves conflicting objectives and hence compromise, and the best designs will always be those that come up with the best compromise." [1] Constrained optimization is the art of compromise between conflicting objectives. This is what design is all about. To find fault with biological design because it misses an idealized optimum, as Stephen Jay Gould regularly does, is therefore gratuitous. Not knowing the objectives of the designer, Gould is in no position to say whether the designer has come up with a faulty compromise among those objectives. [2]

Nonetheless, the claim that biological design is suboptimal has been tremendously successful at shutting down discussion about design. Interestingly, that success comes not from analyzing a given biological structure and showing how a constrained optimization for constructing that structure might have been improved. This would constitute a legitimate scientific inquiry so long as the proposed improvements can be concretely implemented and do not degenerate into wish-fulfillment where one imagines some improvement, but has no idea how it can be effected or whether it might lead to deficits elsewhere. Just because we can always imagine some improvement in design doesn't mean that the structure in question wasn't designed, or that the improvement can be effected, or that the improvement, even if it could be effected, would not

entail deficits elsewhere.

The success of the suboptimality objection comes not from science at all, but from shifting the terms of the discussion from science to theology. In place of *How specifically can an existing structure be improved?* the question instead becomes *What sort of God would create a structure like that?* Darwin, for instance, thought there was just "too much misery in the world" to accept design: "I cannot persuade myself that a beneficent and omnipotent God would have designedly created the *Ichneumonidae* with the express intention of their feeding within the living bodies of Caterpillars, or that a cat should play with mice." [3] Other examples he pointed to included "ants making slaves" and "the young cuckoo ejecting its foster-brother." [4] The problem of suboptimal design is thus transformed into the problem of evil.

The problem of evil is to reconcile the following three propositions: (1) GOD IS GOOD; (2) GOD IS ALL-POWERFUL; (3) EVIL EXISTS. Since the existence of evil is taken for granted, the problem is to account for evil given that God is both good and all-powerful. If God is all-powerful but not good there is no problem reconciling the existence of evil (in that case God is free to be nasty). Alternatively, if God is good but fails to be all-powerful, there is no problem reconciling the existence of evil (in that case God means well but can't quite pull it off).

Critics who invoke the problem of evil against design have left science behind and entered the waters of philosophy and theology. A torture chamber replete with implements of torture is designed, and the evil of its designer does nothing to undercut the torture chamber's design. The existence of design is distinct from the morality, aesthetics, goodness, optimality, or perfection of design. Moreover, there are reliable indicators of design that work irrespective of whether design includes these additional features (cf. my previous posts to META).

Some scientists, however, prefer to conflate science and theology (despite being members of the National Academy of Sciences and professing that these are separate and mutually exclusive realms). Consider, for instance, the following criticism of design by Stephen Jay Gould:

If God had designed a beautiful machine to reflect his wisdom and power, surely he would not have used a collection of parts generally fashioned for other purposes.... Odd arrangements and funny solutions are the proof of evolution--paths that a sensible God would never tread but that a natural process, constrained by history, follows perforce. [5]

Gould is here criticizing what he calls the "panda's thumb," a bony extrusion that helps the panda strip bamboo of its hard exterior and thus render the bamboo edible to the panda.

The first question that needs to be answered about the panda's thumb is whether it displays the clear marks of intelligence. The design theorist is not committed to every biological structure being designed. Mutation and selection do operate in natural history to adapt organisms to their environments. Perhaps the panda's thumb is such an adaptation. Nonetheless, mutation and selection are incapable of generating highly specific, information-rich structures that pervade biology. Organisms display the hallmarks of intelligently engineered high-tech systems: information storage and transfer capability; functioning codes; sorting and delivery systems; self-regulation and feed-back loops; signal transduction circuitry; and everywhere, complex, mutually-interdependent networks of parts. For this reason, University of Chicago molecular biologist James Shapiro regards Darwinism as almost completely unenlightening for understanding biological systems and prefers an information processing model. [6] Design theorists take this one step further, arguing that information processing presupposes a programmer.

Once the intelligent design of some structure has been established, it is a separate question whether a wise, powerful, and beneficent God ought to have designed a complex information-rich structure one way or another. For the sake of argument, let's grant that certain designed structures are not just, as Gould puts it, "odd" or "funny," but even cruel. What of it? Philosophical theology has abundant resources for dealing with the problem of evil, maintaining a God who is both omnipotent and benevolent in the face of evil. The line I find most convincing is that evil always parasitizes good. Indeed, all our words for evil presuppose a good that has been perverted. Impurity presupposes purity, unrighteousness presupposes righteousness, deviation presupposes a way (i.e., a *via*) from which we've departed, sin (the Greek *hamartia*) presupposes a target that was missed, etc. Boethius put it this way in his *Consolation of Philosophy*: "If God exists whence evil; but whence good if God does not exist?" [7]

One looks at some biological structure and remarks, "Gee, that sure looks evil." Did it start out evil? Was that its function when a good and all-powerful God created it? Objects invented for good purposes are regularly co-opted and used for evil purposes. Drugs that were meant to alleviate pain become sources of addiction. Knives that were meant to cut bread become implements for killing people. Political powers that were meant to maintain law and order become the means for enslaving citizens.

This is a fallen world. The good that God initially intended is no longer fully in evidence. Much has been perverted. Dysteleology, the perversion of design in nature, is a reality. It is evident all around us. But how do we explain it? The scientific naturalist explains dysteleology by claiming that the design in nature is only apparent, that it arose through mutation and natural selection (or some other natural mechanism), and that imperfection, cruelty, and waste are fully to be expected from such mechanisms. But such mechanisms cannot explain the complex, information-rich structures in nature that signal actual and not merely apparent design--that is, intelligent design.

The design in nature is actual. More often than we would like, that design has gotten perverted. But the perversion of design--dysteleology--is not explained by denying design, but by accepting it and meeting the problem of evil head on. The problem of evil is a theological problem. To force a resolution of the problem by reducing all design to apparent design is an evasion. It avoids both the scientific challenge posed by specified complexity, and it avoids the hard work of faith, whose job is to discern God's hand in creation despite the occlusions of evil.[8]

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[1] Henry Petroski, *Invention by Design: How Engineers Get from Thought to Thing* (Cambridge, Mass.: Harvard University Press, 1996), p. 30. Petroski is a professor of civil engineering as well as a professor of history at Duke University.

[2] For a critique of Gould's objections to design based on optimality see Paul Nelson, "The Role of Theology in Current Evolutionary Reasoning," *Biology and Philosophy* 11, 1996: 493-517.

[3] Francis Darwin, ed., *The Life and Letters of Charles Darwin*, vol. II (New York: D. Appleton and Co., 1888), p. 105.

[4] Charles Darwin, *On the Origin of Species*, facsimile 1st ed. (Cambridge, Mass.: Harvard University Press, 1964 [1859]), pp. 242-244.

[5] Stephen Jay Gould, *The Panda's Thumb* (New York: Norton, 1980), pp. 20-21.

[6] See his review of Michael Behe's *Darwin's Black Box* in James A. Shapiro, "In the Details ... What?" *National Review*, 19 September 1996: 62-65.

[7] See Boethius, *The Consolation of Philosophy*, in *Loeb Classical Library* (Cambridge, Mass.: Harvard University Press, 1973), p. 153. Alvin Plantinga's free will defense is a resolution of the problem of evil that has provoked much response from philosophers of religion--for a synopsis see Kelly James Clark, *Return to Reason* (Grand Rapids, Mich.: Eerdmans, 1990), ch. 2. Finally, a significant number of contemporary philosophers of religion resolve the problem of evil by denying traditional accounts of divine omniscience and omnipotence. Process theologians have taken this view for some time, but more traditional philosophers and theologians are now taking this line also--see William Hasker, *God, Time, and Knowledge* (Ithaca, N.Y.: Cornell University Press, 1989).

[8] For more in this vein see Diogenes Allen's *Spiritual Theology* (Cambridge, Mass.: Cowley Publications, 1997).

Original article can be found at [The Design Inference](#) website.