

Teleology and Science

-Mike Gene, 2/26/2000

As a product of the government schools and universities, I was always under the impression that the argument about design began with William Paley and ended with Charles Darwin. In fact, in keeping with my indoctrination about the warfare between science and religion, I was under the impression that design was strictly a religious issue and objective science, ala Darwin, had shown a better way. And what is going on today is nothing more than the echoes of those religious knee-jerk reactions to Darwin's brilliant explanation of our biological origins.

But alas, I should have known that my public education was about as accurate as any other form of one-sided indoctrination. It turned out as it always turns out; things are far more complicated than a simplistic materialistic-based education lets on. A nice way of finding this out is to read the first chapter of Barrow and Tipler's book, "The Anthropic Cosmological Principle." In this chapter (entitled 'Design Arguments'), Barrow and Tipler offer an excellent historical overview of both the design and anti-design positions. I thought I would share some of their insights so we can see the current design/anti-design debate in its proper context (rather than the simple-minded 'Inherit the Wind' context that dictates so much of this debate) for the new millennium.

The Argument is Old

Imagine you walk into a room full of scholars representing two very different perspectives on the world. One group argues that living things are the products of some greater wisdom. These scholars point to various biological structures, such as the human eye, and argue that the optimal arrangement of the parts seen in these structures point to some type of designer as their cause. This same group also highlights the harmony and beauty that is seen in the natural world, again suggesting a form of wisdom that lies behind it all. The other group sees things very differently. They appeal to chance and a huge span of time and argue that the harmony and optimal arrangements could very well have arisen by chance. They argue that natural forces, over huge spans of time, served to stabilize these ordered configurations and thus there is no need to invoke any type of designer. This same group then highlights various chaotic features of the world that suggest there is no designer.

You might be thinking that I have been talking about a group of creationists and evolutionary scientists arguing in the auditorium of a local college. You would be wrong. The scholars arguing in that room actually once argued in the halls of Ancient Greece. The teleologists were represented by men such as Socrates, Plato, Diogenes, and Aristotle. The nonteleologists were represented by such men as Democritus, Leucippus of Elea, and Epicurus of Samos. These thinkers argued back-and-forth with each other over a period of about 200 years. Their works would later influence such European scientists and philosophers as Robert Boyle, William Paley and David Hume.

In other words, the arguments for design did not start with Paley, nor did they start with naïve religious believers. No, such arguments began with people like Socrates and Aristotle. For example, Socrates once extolled the human eye as a proof of the wisdom of the gods:

"Is not that providence, Aristodemus, in a most eminent manner conspicuous, which because the eye of man is delicate in its contexture, hath therefore prepared eyelids like doors, whereby to screen it, which extend themselves whenever it is needful, and again close when sleep approaches?...And can't thou still doubt Aristodemus, whether a disposition of parts like this should be the work of chance, or of wisdom and contrivance?"

Of course, Aristotle would take this all much further. As Barrow and Tipler (B&T) point out:

"Aristotelian science was based upon presupposition of an 'intelligent natural world that functions according to some deliberate design'. Its supporters were therefore very critical of all those pre-Socratic thinkers who regarded the world structure as simply the inevitable residue of chance or necessity."

But what of the non-teleologists? B&T write:

"The Epicureans were, of course, anxious to scotch any notions of supernatural causation or the appeal to any entity who controls or ordains events. Interestingly, no useful scientific structure was erected upon this materialistic foundation because Epicurus had a very low view of mundane scientific investigation."

And then there is the Roman poet Lucretius Carus (99-55BC). B&T write:

"Lucretius believed life to have originated at some definite moment in the past by natural processes but that created beings included 'a host of monsters, grotesque in build and aspect' who were subsequently eliminated by their sterility."

These ideas sound strangely similar to those of Charles Darwin. In fact, Lucretius even wrote:

"In those days, again, many species must have died out altogether and failed to reproduce their kind. Every species that you now see drawing the breath of the world survived either by cunning or by prowess or by speed. In addition, there are many that survive under human protection because their usefulness has commended them to our care."

I wouldn't be surprised if Darwin borrowed these ideas and thus his views about natural selection are not something that was forced upon him by the raw data (as the romantic story book version of history teaches).

And speaking of borrowing, does this sound familiar?:

"When we see some example of a mechanism, such as a globe or clock or some such device, do we doubt that it is the creation of a conscious intelligence? So when we see the movement of the heavenly bodies...how can we doubt that these too are not only the works of reason but of a reason which is perfect and divine?"

No, this is not from William Paley, but instead was written by the Roman lawyer and orator, Marcus Cicero (106-43 BC). Cicero would also write something that sounds equally familiar:

"Can I but wonder here that anyone can persuade himself that certain solid and individual bodies should be moved by their natural forces and gravitation in such a manner that a world so beautiful adorned should be made by fortuitous concourse. He who believes this possible may as well believe, that if a great quantity of the one and twenty letters, composed of gold or any other matter, were thrown upon the ground, they would fall into such order as legibly to form the 'Annals of Ennius'. I doubt whether fortune could make a single verse of them."

Finally, even something as odd as the current Many Worlds Hypothesis (used to side-step Fine Tuning) may not really be new. The materialist Democritus would write:

"There are worlds infinite in number and different in size. In some there is neither sun nor moon, in others there are more than one sun and moon."

The point is that this debate between teleology and materialism is at least 2500 years old and has involved some of history's greatest thinkers. The notion that current ID arguments are nothing more than Christian reactions to the painful "truth" of Darwinism is a notion divorced from historical context.

If one's sense of history goes no further than 100 years, it's easy to get the impression that materialism has been vindicated and teleology has been refuted. But if that sense spans 2500 years, one suspects only that materialism has just recently obtained the upper hand with more sophisticated versions of the same arguments. The ID movement has the potential of evening the playing field by reviving its arguments in more sophisticated versions. Is the 2500 year-old debate really over? Of course not.

Teleology Important to Science

Design critics often claim that the concept of design has never been useful in science. They are plain wrong. A nice example that demonstrates this comes from William Harvey, who employed teleological reasoning to uncover the circulation of blood. According to B&T:

"The way in which this respect for Aristotle was realized in Harvey's works seems to have been in the search for discernible purpose in the workings of living organisms- indeed, the expectation of purposeful activity.....he tried to conceive of how a purposeful designer would have constructed a system of motion."

In a conversation with Robert Boyle, Harvey explained how he hit upon such an idea as the circulation of blood. He noted the positioning and shape of the valves in the veins and was

"invited to imagine, that so Provident a cause as Nature had not so placed many valves without Design; and no Design seem'd more possible than that, since the Blood could not well, because of the interposing valves, be sent, by the veins to the limbs; it should be sent through the Arteries and return through the veins."

The success of Harvey (and science) owed much to design reasoning.

Boyle himself is often considered the father of modern chemistry and was also a huge proponent of Design. According to B&T:

"It was Robert Boyle who became the most eloquent expositor and spirited supporter of the 'new' design argument. Boyle laid emphasis upon specific examples and coincidences of Nature, claiming them as 'curious' and excellent tokens and effects of divine artifice."

And, more importantly:

"Another original aspect of Boyle's approach to final causes was his claim that the discovery of features pointing to design in Nature is promoted principally by experimental science and provides a strong motivation for these empirical investigations."

Teleology played a crucial role in providing the motivation for doing science. Recall that the Epicureans disdained mundane science and contrast this attitude with that of Boyle.

In fact, let's go back to consider something from another teleologist, the Roman philosopher Boethius (470-525). Boethius championed the teleologists Socrates and Aristotle at the expense of the Stoics and Epicureans. In my opinion, he would succinctly capture the essence of the 2500 year old debate:

"Thinkest thou that this world is governed by haphazard and chance? Or rather dost thou believe that it is ruled by reason?"

In my opinion, teleology is its strongest in this form. Namely, is not the core of reality based on reason? Modern science is premised on the faith that reality is rational and coherent and it owes this faith to the teleologists and not the materialists.

In fact, even Kant would recognize the importance of the Design argument. B&T write:

"He admits great respect for the argument because of its stimulus to scientific enquiry: he realizes that many biological investigations have been motivated by the expectation of purpose in organic structures."

Kant writes of Design:

"It enlivens the study of nature...It suggests ends and purposes, where our observation would not have detected them by itself, and extends our knowledge of nature by means of the guiding concept of special unity, the principle of which is outside Nature."

Let me now quote a long portion from B&T that helps set the context of the current debate:

"Kant's notion of teleology had an enormous influence on the work of German biologists in the first half of the nineteenth century. Like Kant, for the most part these biologists did not regard teleology and mechanism as polar opposites, but rather as explanatory modes complementary to each other. Mechanism was expected to provide a completely accurate picture of life at the chemical level, without the need to invoke 'vital forces.' Indeed, Kant and many of the German biologists were strongly committed to the idea that all objects in Nature, be they organic or inorganic, are completely controlled by mechanical physical laws. These scientists had no objection to the idea that living beings are brought into existence by the mechanical action of physical laws. What they objected to was the possibility of constructing a scientific theory, based on mechanism alone, which described that coming into being, and that could completely describe the organization of life...In Kant's view, a mechanical explanation...could be given only when there is a clear separation between cause and effect. In living beings, causes and effects are inextricably mixed...ultimate biological explanations require a special non-mechanical notion of causality - teleology - in which each part is simultaneously cause and effect. Parts related to the whole in this way transcend mechanical causality."

B&T continue:

"The limitation of explanation in terms of mechanical causality can perhaps be best understood by comparing a living being to a computer. As Michael Polanyi has pointed out the internal workings of the computer can of course be completely understood in terms of physical laws. What cannot be so explained is the computer's program. To explain the program requires reference to the purpose of the program, that is, to teleology. Even the evolution of a deterministic Universe cannot be completely understood in terms of the differential equations which govern evolution. The boundary conditions of the differential equations must also be specified. These boundary conditions are not determined by the laws of physics which are differential equations."

B&T then write something that I think nicely summarizes the where the modern ID movement stands:

"The universal boundary conditions are as fundamental as the physical laws themselves; they must be included in any explanation on par with the physical laws."

So What Went Wrong?

If teleological thinking has played such a crucial role in the formation of modern science, why has it seemingly been banished? B&T nicely answer this also:

"In spite of such scientific feats, by the latter part of the nineteenth century the telomechanists had been eclipsed by the reductionists. The great weakness of the telomechanists was their tendency to think of teleology not only as a plan of organization but also as an actual life force, a tendency which Kant warned against. This led them to believe it was impossible for organisms to change their fundamental plan of

organization, that is, to evolve, under the action of inorganic forces. As a consequence, they later opposed Darwin's theory of evolution by natural selection, and as the evidence for such evolution became overwhelming, they ceased to exert an influence on the development of biology."

Of course, B&T seem to be confusing evolution with Darwin's mechanism, as it is simply not true that there is overwhelming evidence that everything has evolved via variation and natural selection. But I think they are correct in noting that teleology tied itself with vitalism and this spelled its demise.

Can It Be Fixed?

The reason I think teleology will eventually re-assert its position in science is that vitalism is simply not entailed by teleology no more than pantheism is entailed by monotheism. The modern ID movement is not simply a religious reaction against Darwinism. Nor is it simply replaying old failed versions of teleology.

The modern ID movement is heeding Kant's warning and does think of teleology as a plan of organization and not a vital life force. The software is just as important as the hardware and the boundary conditions are just as important as the differential equations. These are valid insights and are being carried forward by those in the ID movement. For example, Bill Dembski does not seek out a vital force, he seeks out empirical detectors of a mind's ability to implement a plan.

I think ID will indeed develop into a very serious research approach to the extent that it does not tie itself to religious apologetics or become hyper-skeptical of anything that supports evolution. It will succeed when two things happen:

1. It becomes clear to many that biology has long been drawing from teleology to succeed. Although it officially denies teleology, biology works only because it *relies* on teleology. The illusion is that biology's success has been guided by the assumptions of materialism and Darwinian evolution. Yet materialism cannot justify the constant reference to intelligent design concepts and language so ubiquitous in biology and Darwinian evolution is more like icing on a cake than any kind of core ingredient.
2. It will take only a slight nudge to shift the hidden teleology of biology out into the open. That is, ID researchers can easily do all that science has done and perhaps more by simply viewing a protein as a sensor rather than being like a sensor. Science is built upon the faith that reality is rational and ID can take this faith into the realm of biology, where thus far, the discovery of the irrational has become the stop point at the hands of the irrational blind watchmaker.

ID will not win many converts among those practicing science or philosophy today. That's not typically how things happen. But when new generations of students begin to appreciate what it means to speak of the quality control and/or proof reading mechanisms of the cell (for example), and the manner in which ID is flippantly and arrogantly dismissed by the establishment, things will change. Materialists have only one hope: to quickly find a way to teach and study life without ID concepts and language. Since this hope is likely in vain, ID will probably return as a serious player. Biologists can say that life is not designed, but as biologists, they treat life *as if* it were designed. And sooner or later, people pay more heed to what you do than what you say.