

Intelligent Design in Historical Perspective*

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The advocates of intelligent design hold that important properties or aspects of nature are intended i.e., that they are the results of intelligent planning and design. In other words, they maintain that some features of cosmos and nature (i.e., the physical universe and the living things) are caused by non-human intelligence. Nothing in particular is said about the nature of the designer. However, it is clear that most advocates of intelligent design imagine a transcendent designer and not some other sort of extra-terrestrial intelligence. In this way, the position is mainly related to the various religious beliefs according to which the universe is conceived as the outcome of divine intention.

The very notion of ‘design’, however, certainly needs some kind of clarification. According to Del Ratzsch [2001, p.3], a design is “a deliberately intended or produced pattern”, and he adds that a pattern may be understood as “an abstract structure which correlates in special ways to mind or is *mind correlative*” in such a way that the structure “fits human processes of cognition” or “makes sense to humans”. This means that a design is not just any order in nature. To be a design it has to be a pattern, which is there because of a plan or intent, and which has been realized in the physical world.

The claim of intelligent design is not that everything in the universe is designed or planned. It is consistent with the view that certain aspects of nature are caused by stochastic processes in nature. The claim of intelligent

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design is merely that a number of initial conditions and essential properties of cosmos and nature are in fact planned or designed intelligently. The main argument of the advocates of intelligent design is that there are some very complex structures in nature, which cannot be satisfactorily explained as the result of natural processes. As pointed out by Howard J. van Till, proponents of Intelligent Design have argued that “there is empirical evidence that the universe’s system of natural capabilities for forming things is inadequate for assembling certain information-rich biological structures” [2003]. It could be added that similar claims have been made regarding very complex patterns in physics and cosmology. For this reason the advocates of intelligent design have maintained that a proper and satisfactory description of cosmos and nature should include references to ‘purpose’ i.e. that, in principle, teleological descriptions should not in principle be excluded from the scientific literature.

A great majority of the scientific community rejects the scientific validity and relevance of the ideas of intelligent design. Some writers have even claimed that these ideas are scientifically dangerous, since a conclusion such as ‘it is designed’ in their opinion is likely to stop further inquiry into the topics in question. In many cases, the ideas of intelligent design have been characterized as non-serious at least when presented as scientifically relevant descriptions of cosmos and nature. Instead, intelligent design has been viewed as based on various religious beliefs and on a certain reactionary political agenda.

Intelligent design has sometimes been presented as a new view invented in the 1990s by ultra-rightwing fundamentalists in USA. However, although it is true that a new intelligent design movement has become very strong and that it has been intensely debated in USA and in other parts of the world since the mid 1990s, and although it is probably true that some of the founders and defenders of the ideas of intelligent design have related their interests in these ideas to their ideological and political ambitions, it will be a severe mistake to see the idea of plan and design in the physical and biological world as something brand new invented in the 1990s in USA. The basic idea of nature and cosmos as being intended is definitely not new. On the contrary, the view that essential characteristics of cosmos and nature are

results of planning rather than chance or accidents is very old. In this paper, we are going to argue that this view was essential in the process that led to the rise of modern science.

In a letter to J.E. Switzer, written in 1953, Albert Einstein stated that modern science presupposes

- 1) The invention of formal logical systems, and
- 2) The discovery of the possibility of finding out causal relationships by systematic experiment (see [Needham 1969, p.43]).

The former invention was made by Aristotle and further developed by later ancient and medieval philosophers working in the Aristotelian tradition, whereas scientists discovered the latter during the Renaissance.

Einstein's analysis is obviously true, and it can be added that both prerequisites of modern science should originally be understood in the context of design and transcendence.

In section one of this paper, we shall show that the tradition of logical investigation, on which scientific inquiry as such is based, is itself strongly related to the belief in transcendence according to which it is quite natural to look for order, plan and design in the world. In section two, it will be argued that the important pioneers of modern science in general maintained that the world was planned and designed by God, and that this view stimulated rather than stopped their scientific investigations. The reaction during the 18th and 19th centuries against the universe as designed will be discussed in section three, whereas the modern opening established through the anthropic principle for reintroducing the idea of design in the scientific discourse will be considered in section four. Finally, in section five, we shall briefly discuss the possible rôle of the vocabulary suggested by the advocates of intelligent design in future scientific discourse and also some of the problems, which the modern movement of intelligent design has to face.

1. The Logical Foundation of Science

It is commonly agreed that Aristotle was the founding father of Western logic, although elements of logic can certainly be pointed out in pre-Socratic thought and in the writings of Plato.

One of the basic concepts in Aristotle's approach to logic was the syllogism. In fact, his system of the valid syllogisms can be understood as the first axiomatic system ever. Aristotle argued that the set of the valid syllogisms can be organized in a beautiful deductive system. However, this obviously presupposes that the valid syllogisms are known. But which of the many possible syllogisms are valid and which are not? Aristotle provided a very clear answer to this question. In fact, it is most interesting that it is possible in any group of people to reach a very high degree of agreement on the question of validity of the syllogisms. For instance, everybody will agree that the syllogism:

some S are M
all M are P
ergo: some S are P

is valid whereas everybody will agree that the structure

some S are M
some M are P
ergo: some S are P

is certainly not a valid syllogism. But what is the origin of this agreement? The same fundamental question could be asked with respect to many other kinds of logical reasoning. Aristotle himself formulated the question in a very precise way:

And the starting-point of reason is not reason, but something superior to reason. What then could be superior even to knowledge and to intellect, except God? [Eudemian Ethics VIII. II, 22]

Aristotle obviously considered the origin of logic to be transcendent and ‘super-intelligent’. Although he did not present any detailed exposition of the nature of logic, he was obviously aware of the fact that the question of validity of logical arguments is related to the problem of the semantic structures of natural language. His interest in language and semantics becomes evident when one considers his famous ten categories, which can be used in order to explain the meaning of a sentence. The categories can be viewed as basic components of meaning. The very fact that we are able to understand and to reason about essential elements of the world may lead us to believe in a transcendent designer. That was at least the way things were conceived in the mainstream of scholastic interpretation of Aristotelian thought.

One of the most important scholars in the medieval tradition was Thomas Aquinas (1224-74), who suggested five ways to God based on reflection and reasoning about the world. In the present context, the most important argument is the fifth way, which is now seen as the classical argument from design. It may be described in the following manner:

The Fifth way starts from the orderly character of the mundane events, argues that all things are directed toward one end (the principle of finality), and concludes that this universal order points to the existence of an Orderer of all things. [Bourke 1967, p. 110]

According to Thomas, this ‘Orderer of all things’ is the Christian God, the Creator. This conclusion is not part of the argument from design as such. However, following the scholastic (and Aristotelian) line of thinking, man’s capability of logic and rationality as well as the validity of logic and rationality as such must come from something superior, something or someone transcendent. Much later, C.S. Peirce (1839-1914) tried to answer a similar question: How can it be that man using scientific investigation relatively effectively can find important aspects of the truth about nature? In answering questions like that he formulated what he called ‘A Neglected Argument for the Reality of God’, which was first published in the Hibbert Journal (1908). Peirce rejected the idea that the scientific results have come about only “by some such modification of chance as the

Darwinian supposes” [CP 6.476]. To Peirce, this was simply too unrealistic. It seemed obvious to him that man has done much better than that during the history of science. Peirce formulated his own answer in the following way:

There is a reason, an interpretation, a logic, in the course of scientific advance, and this indisputably proves to him who has perceptions of rational or significant relations, that man's mind must have been attuned to the truth of things in order to discover what he has discovered. It is the very bedrock of logical truth. [CP 6.476]

Peirce’s idea is that man has been created with a special kind of mind, which makes him able to discover truth. For Peirce, this view was intimately related to his belief in God, according to which man may even “see” God, if he opens his eyes and heart! [CP 6.493]

A similar reflection on man’s ability to find truth can be found in the writings of the great Polish logician Jan Łukasiewicz (1878-1956), who beautifully formulated his view in the following way:

Now, whenever I work even on the least significant logistic problem, for instance, when I search for the shortest axiom of the implicational propositional calculus I always have the impression that I am facing a powerful, most coherent and most resistant structure. I sense that structure as if it were a concrete, tangible object, made of the hardest metal, a hundred times stronger than steel and concrete. I cannot change anything in it; I do not create anything of my own will, but by strenuous work I discover in it ever new details and arrive at unshakable and eternal truths. Where is and what is that ideal structure? A believer would say that it is in God and is His thought. [Łukasiewicz 1970, p.249]

This view is very close to the traditional Christian view: Given the belief in a rational God and the belief that man is created in the image of God, it becomes natural and reasonable to understand the logical structure of reality as an essential aspect of the designed order of the created universe i.e. as a reflection of the divine wisdom. In fact, a similar view of a cosmic rationality

and wisdom much deeper than the positivistic approach to reason has recently been strongly defended by Pope Benedikt XVI:

Modern scientific reason quite simply has to accept the rational structure of matter and the correspondence between our spirit and the prevailing rational structures of nature as a given, on which its methodology has to be based. [Pope Benedikt XVI, 2006]

If the pope is right, the belief in a rational world order is essential for science as such. This view seems very convincing. Without a belief in a structure or design in the physical universe, many scientists will probably lose their motivation. As we shall see in the next section, a strong belief in the rational structure of the physical universe was a very important background for the rise of modern science.

2. The Pioneers of Natural Science and the Belief in Intelligent Design

The history of science is very long, but the scientific idea of establishing causal relationships by systematic experiments is relatively recent. It was invented in Europe during the Renaissance and it turned out to be essential to what we now call natural science. But why was this invention not made in India or in China. In many respects, these civilisations in the East were more advanced than the European civilisation in the 16th century. According to J. Needham, this should be explained referring to the rather different approaches to nature in Europe and the civilisations in the East:

(In China) there was no confidence that the code of Nature's laws could ever be unveiled and read, because there was no assurance that a divine being, even more rational than ourselves, had ever formulated such a code capable of being read. [Needham 1969, p. 327].

If Needham is right, it would also be correct to say that the rise of modern science is at least partly based on the belief in some sort of intelligent design in nature. As it has been argued elsewhere (see e.g. [Thorvaldsen 2002]) that the pioneers of natural science saw the very fact that we may gain reliable and meaningful information about reality from our senses and our reason as an indication of some kind of divine order and design in nature. One may say that this is how the pioneers of natural science understood why understanding is possible at all. One interesting example would be Johannes Kepler (1571-1630) who believed that man could acknowledge the mathematical order in the universe. In a letter to Mästerlin, April 19, 1597, he wrote:

Those laws [which govern the material world] lie within the power of understanding of the human mind; God wanted us to perceive them when He created us in His image in order that we may take part in His own thoughts...[Caspar and Dyck 1930, band I, p. 44]

Kepler maintained that since man is created in the image of God, the human mind is at least to some extent in fact capable of understanding the divine rationality and design expressed in nature. It seems that Kepler's view can meaningfully be explained in terms of the following diagram:

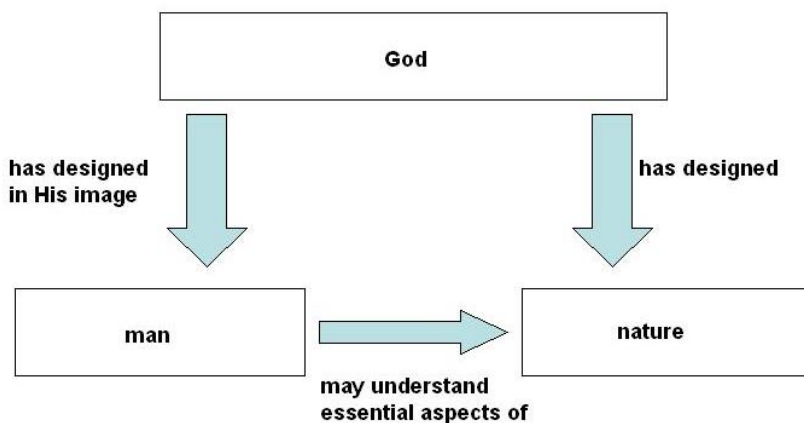


Figure 1: Diagram of Kepler's view.

According to this view, God has created the physical world giving form, design and structure in accordance with certain mathematical and logical ideas. In addition, God has created man with the capability of understanding this mathematical and logical code according to which the physical universe has been structured. A similar view can be found in the writings of Galileo Galilei (1564-1643):

Philosophy is written in that great book which ever lies before our eyes - I mean the universe - but we cannot understand it if we do not first learn the language and grasp the symbols, in which it is written. This book is written in the mathematical language ... [Drake 1957, p. 237]

Obviously, the idea of the universe as similar to a book presupposes the view that important patterns of the universe are intended i.e. designed. Galilei did not claim that we as human beings will be able to read all the parts of “that great book”, but to the extent that we can understand its language we may understand essential parts of the divine wisdom expressed in the physical universe.

The view of the universe as intended by God in his wisdom was basically common to all the important pioneers of modern science. As Isaac Newton (1642-1727), they all believed that the universe is intended, created, and ruled by God who is understood as a living, intelligent, powerful, and supreme being (see [Thorvaldsen 2002, p.27]).

3. The Rejection of the Idea of Nature as Designed

During the 18th century, it became important for many writers to make a distinction between science and religion. This was among others the view of Immanuel Kant (1724-1804). He had clear objections to the classical argument from design. On the other hand, in his *Critique of Practical Reason* (1788) he wrote:

Two things fill the mind with ever new and increasing admiration and awe, the more often and steadily we reflect upon them: the starry heavens above me and the moral law within me. (Quoted from [Schönfeld 2003]).

This at least suggests that he was sensitive to the kind of observations, which have led people to the belief in the world as intended.

During the 19th and 20th centuries, the belief in the universe as designed became less influential. Many scientists and philosophers wanted to have a worldview without any direct or indirect reference to a divine creator. Charles Darwin was one of the most famous scientists who gave up his belief in a divine designer. In his autobiography, he wrote:

The old argument from design in nature as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection has been discovered. (Quoted from [Dembski 1998, p. 84])

It seems, however, that one of Darwin's main reasons for giving up his former belief in God was based on considerations regarding the problem of evil i.e. not a strictly scientific reason. In his own words:

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 bodies of Caterpillars, or that a cat should play with mice. (Quoted from [Dembski 1998, p. 90-91])

It has in fact often been the case that various non-scientific, but rather philosophical or existential reasons have been given for rejecting the idea of divine designer of nature.

The replacement of the design idea has been some sort of mythology dealing with the notion of chance. One of the strong claims regarding this view has been made by Jacques Monod in his *Chance and Necessity* (1971):

Man at last knows that he is alone in the unfeeling immensity of the universe, of which he has emerged only by chance. Neither his destiny nor his duty has been written down. [Monod 1971, p.167]

It has become an essential part of this new paradigm to exclude all references to ‘purpose’ and teleological explanations in general from scientific discourse. As stated by one of the famous advocates of this view, G.G. Simpson, even man should be conceived as ‘purposeless’:

The meaning of evolution is that man is the result of a purposeless and materialistic process that did not have him in mind. [Simpson 1953, p.179].

Following this line of thought it has been important to most scientific writers to avoid all references to ‘purpose’ in nature. The physical and biological world has in general been conceived as ‘purposeless’. Until recently, this kind of very strong ‘teleophobia’ - in fact almost a teleology taboo - has dominated scientific circles i.e. there has been a clear reaction among scientists against any reference to purpose in nature. On the other hand, some well known scientists have maintained that we still need to explain why so many elements and aspects of nature at least appear to be designed, and they have argued that this can only be done using ideas of “a new kind of science” [Wolfram 2002, p.861].

4. The Anthropic Principle and the Reintroduced Idea of Design

During the 1980s, it became evident that an expanding universe must have some very specific properties at its beginning if it is going to include biological life at some later stage of its history. In 1986, the scientists John D. Barrow and Frank J. Tipler published their very influential book, *The Anthropic Cosmological Principle*, in which they discussed the interpretation of the fact that the universe at its beginning had these very rare properties which would allow biological life (including man) to exist at some later stage

of its history. It is outside the scope of this paper to give a detailed account of the many different versions of the anthropic principle discussed by Barrow and Tipler – and later also by others. But it should be noted that in their book, Barrow and Tipler suggested a clear relation between their findings and the long tradition of dealing with teleological explanations. One of the principles, which they considered in their book was the so-called ‘strong anthropic principle’:

There exists one possible Universe 'designed' with the goal of generating and sustaining 'observers.' [Barrow and Tipler 1986, p. 22]

The interesting point here is, of course, the use of the word ‘designed’. In a sense, the authors are here breaking the teleology taboo. The idea seems to be that if a designer at the beginning of the universe wanted to make sure that biological (including intelligent) life could exist at a later stage of the history of the universe, he would have to make sure that the laws of nature work in a certain way and that the fundamental constants of nature have certain rather specific values.

The need for very special conditions at the beginning of the expanding universe is a rather established insight. As the theoretical physicist Paul Davies has put it in his book *The Cosmic Blueprint* (1988):

The really amazing thing is not that life on Earth is balanced on a knife-edge, but that the entire universe is balanced on a knife-edge, and would be total chaos if any of the natural constants were off even slightly. You see, even if you dismiss man as a chance happening, the fact remains that the universe seems unreasonably suited to the existence of life - almost contrived - you might say a put-up job. (Quoted from [Bossard 2005]).

And Paul Davies adds:

I hope the foregoing discussion will have convinced the reader that the natural world is not just any old concoction of entities and forces, but a marvellously ingenious and unified mathematical

scheme... these rules look as if they are the product of intelligent design. I do not see how that can be denied. (Quoted from [Bossard 2005]).

However, although the properties of the universe may look as if they are the product of intelligent design, they do not have to be exactly that. Other interpretations are possible. One alternative possibility would be the so-called multiverse-hypothesis i.e. the idea that there is not only one universe, but in fact infinitely many universes with all kinds of different properties. According to this view, we live in one of these parallel universes, which will of course be one with the properties suited for biological life. Paul Davies has made the following comment on this idea:

To postulate an infinity of unseen and unseeable universes just to explain the one we do see seems like a case of excess baggage carried to the extreme. It is simpler to postulate one unseen God. (Quoted from [Bossard 2005])

Although, this criticism of the multiverse-hypothesis sounds very reasonable, it does not finally settle the questions regarding the interpretation of the facts, which have given rise to the various anthropic principles. These interpretation questions are still open, and they may in fact be undecidable from a logical point of view. What is important in the present context, however, is that the discussions regarding the anthropic principles have made it acceptable to include teleological explanations in the scientific discourse. In other words, the discussion regarding the anthropic principles has made it possible for scientists to reintroduce design notions in various scientific contexts.

It should, however, be added that it will be possible to make a distinction between the use of teleological explanations and concepts in the context of fundamental cosmology and the use of the same explanations and concepts within biology. It seems that Paul Davies is ready to accept the idea of the laws and natural constants being designed, whereas he refuses the idea of the miraculous intervention of a divine designed in the course of time. In his own words:

There is no doubt that ... the hypothesis of an intelligent designer applied to the laws of nature is far superior than the designer ... who violates the laws of nature from time to time by working miracles in the evolutionary history. Design-be-laws is incomparably more intelligent than design-by-miracles. [Davies 2006, p. 226]

When formulated in this way, Davies' reaction is quite understandable. Why should a transcendent designer want to violate his own laws? But maybe the problem lies in the very notion of 'law of nature'. Again, we may refer to C.S. Peirce, according to whom the traditional notion of a 'law of nature' should be conceived as a "course of nature" or a "habit of nature". For this reason Peirce would not see miracles as violations of laws of nature but as special and important events in history. (See [O'Hara 2006, p. 14]).

5. Design, Purpose and Scientific Discourse

Given the impact of the debate regarding the anthropic principles and the present discussions regarding intelligent design, it becomes relevant to discuss whether notions of design should again be allowed in scientific theories and descriptions. As mentioned above, most scientists are still against including such notions in the scientific discourse. As mentioned, some scientists even fear that the use of teleological explanations in science is likely to stop further inquiry into the topics in question. However, given the historical background, it will definitely be a misunderstanding to assume that the use of teleological explanations as such will be dangerous in science and that we therefore should ban all references to 'plan', 'design', and 'purpose' from serious scientific discussions on the features of cosmos and nature. The use of such references has never been a hindrance to scientific progress, and there is no reason to believe that it should function in that way now if accepted in scientific theory and vocabulary.

Allowing teleological explanations and the formulation of scientific problems referring to 'purpose' and 'design' will obviously broaden the scientific discourse. And it should be added that an extended language will

bring us back to the basic scientific language used by the pioneers of modern science. There is no reason to exclude the possibility that a wider scientific language may lead to new questions and new ideas, which may in turn give rise to new findings in science. A similar view has been defended by Owen Gingerich, who is a Harvard professor of astronomy and the history of science, in his fascinating paper: “Dare a Scientist Believe in Design?”:

So, while I differ from those Christian biochemists who postulate some new kind of “origin science”, I do think a science totally devoid of the idea of design may be in danger of running into a blank wall. And this brings me to ask again, is the idea of design a threat to science? And I answer no, perhaps design might even be a necessary ingredient in science. [Gingerich 1994, p.31-2].

However, there are still many questions, which should be discussed in relation to the question of reintroducing notions of ‘plan’ and ‘design’ in scientific discourse. As pointed out by Paul Davies, one of the difficult notions which need further clarification is the idea of cosmological design prior to time itself (see [Davies 2006, p. 227 ff.]).

Conclusion

As we have argued, the pioneers of modern science used teleological explanations as well as ideas of design and plan in their scientific discourse. We have also seen that such explanations and ideas became banned in scientific texts during the following period, and that some scientists and philosophers of science have recently argued that notions of design, etc. should be accepted again in science. Since the publication of Barrow and Tipler’s book in 1986, it has often been argued that the anthropic principles can only be discussed in a satisfactory manner if teleological explanations and concepts are accepted in the discussion. Recently, advocates of intelligent design have made similar claims. Of course, such questions will also be tied up with the ambition to give a true account of nature. As pointed out by Pope Benedikt XVI in his recent lecture in Regensburg, honest

scientists who treasure scientific ethos will always want “to be obedient to the truth”. If the advocates of intelligent design are right, scientific truth cannot be fully accounted for without accepting teleological ingredients in the scientific language. If they are wrong, all cases of apparent purpose and design in nature are in fact nothing more than apparent and definitely not signs of any real intention or plan. From a strictly scientific point of view, however, it may formally and empirically be both undecidable and unknowable who is in fact right and who is wrong [Yockey 2005, p.171-175]. The matter ultimately has to be decided on the basis of metaphysical and other philosophical arguments. This obviously does not make the discussion between the positions uninteresting or unimportant.

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