Intelligent Design – Renewed science or old Creationism in new Design?

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Summary

Intelligent Design (ID) is a doctrine set up as an alleged alternative to evolution theory. It aims at explaining the development of intelligent life and other complex structures of the empirical world by appeal to an intelligent cause. The theory is so designed that it can be theistically interpreted identifying this cause with the Creator-God of a Biblicist reading of the Genesis story of creation. For this doctrine resembles Creationism, this article scrutinizes ID's relation to Creationism from a historical and a systematical point of view. They turn out to be quite closely related and to be only allegedly, but not really science. Nevertheless, Theology and Biology can draw some lessons from the debate about ID.

1 Introduction

Intelligent Design (ID), first a purely US-American phenomenon, has now reached Europe. The famous German magazine *Der Spiegel* – not very renowned for reports on religious topics – had a cover story on it.[1] Some famous church officials commented on ID and on what they consider to be flaws in evolution theory.[2] One could get the impression that a spectacular new step is reached in the debate between Biology and Theology. To be sure, such a debate is of utmost importance. But is ID really a step forward in it? Is it not just the old naive dilemma "Science or Bible"? ID people suggest their audiences to have a solution satisfying for both, theologians and scientists. Is it really?

To assess these questions, one has to ask what exactly ID means, what its origins are, and what goals it is intended to reach. Its claims to be a scientific alternative to evolution theory have to be scrutinized. As ID aims to be supportive of Christian belief in the creation of God, one also has to ask whether it is really the Christian belief in creation what it argues for.

This paper is organized as follows: Section 2 presents an historical overview of Creationism in the U.S. Section 3 then tries to assess the relation between ID and

[1] See Der Spiegel 52/2005, top cover.

[2] See Schönborn 2005.

Creationism. Section 4 deals with arguments for and against ID, and Section 5 proposes some conclusions as to which ends the ID debate could be fruitfully used.

2 Creationism – Highlights in the history of quite an American problem

The debate on ID in the U.S. is quite hot tempered. This can only be understood if one considers the history of Creationism with its political, pedagogical, and religious aspects. This background information will allow to understand the formation of ID and to critically assess the self-description of ID supporters according to which ID is not a version of Creationism. Due to the lack of space the following historical considerations will be presented in a shortened version.

The roots of Creationism reach back until the time of reformation in Europe. Luther, Calvin, and Zwingli emphasized that nothing should stand between the bible and its readers. The famous *sola scriptura* became a shibboleth that officially precluded any norms for interpretation established by a religious tradition or community. This individualization paved the way for Biblicist readings, i. e., for readings that take most of the text as historical report. Biblicism led some protestant groups to form opinions that differed strongly from common sense. As a result, these groups were socially isolated and tended to leave Europe for America. This early historical developments gave rise to the paradoxical situation of the U.S. until today: the most liberal religious country hosts the strongest religious radicals of Christianity.

Another root is evolution theory. Charles Darwin's two main works – *On the Origin of Species by Means of Natural Selection* (1859) and *The Descent of Man* (1871) – were for sure the most important individual contribution to it. The former one explains the plurality of species by the metaphor of the "tree of descent" according to which different species can well have a common predecessor. The principle of the development of species is natural selection: advantageous variations allow to reproduce and survive better. The public reaction to *The Origin of Species* was more or less calm, biologists found it worth discussing, and most theologians did not feel the need to worry about it. This changed dramatically when in his *The Descent of Man* Darwin asserted that apes and man have common predecessors and developed from them by evolutionary, selective processes. The public reactions now were furious, and not restricted to religious groups. For many people the assertion that humans descended from apes – so the somewhat oblique slogan went – was "coming on strong". The controversial subjects included the common origin of all species including humans (macro evolution), the principle of natural selection, the non-directedness of evolution, and the age of the earth. It is interesting to note that there was no consensus in 19th century science about a high age of the earth, and that, to the contrary, geologists and cosmologists generally assumed an age that was too low for evolution to have taken place.

The challenges for the Christian belief in God's creation of the world, however, are therewith at hand: What about the dignity of man and his position as creation's

crown, if he has descended from animals or even stands on the same level? What about the belief in the creation of the world *in one act* of God, if it continually develops and changes? How relate evolution theory's presupposition of (at least) some hundred millions of years to the 6 days from the biblical book of Genesis? – These questions are not easy to answer. The simple-minded Biblicist reader of the bible here sees plain contradictions which in turn put him in opposition to evolution theory.

In the U.S., the strongest responses came from the south, from radical religious groups like the Seventh-Day Adventists or the Southern Baptists who opposed evolution theory right from the beginning. Furthermore, segregationists could hardly accept it as it can be seen to level the differences between human races. A running slogan was: "Who assents publicly that Adam was not made from soil, can just start looking for a new job." On the other side, evolution theory prevailed in science and made its way via college alumni and teachers to broad areas of the American public. So, at the end of 19th century, the American society showed a patchy picture of different tendencies.

Anti-evolutionist tendencies became a reality in actions of individuals, small groups and miniature organizations, which cannot be discussed in detail here. Just to mention three examples: Geologist and Adventist George McCready Price (1870–1963) fought for Creationism in science. In his books (1906 and 1923) he disputed the methods to determine the age of fossils and propagated that all geological evidence was produced by a large flood like the one in the biblical narrative about Noah (Gn 6–9). His arguments completely lost ground when the exact methods of radioactive decomposition analysis had been established. William Bell Riley (1861–1947), a Baptist pastor, was one of the most eminent exponents of the so-called "Day Age theory" according to which the "days" in the biblical Genesis story are not to be taken as real days, but (in accordance to Ps 90,4: "thousand days are for you like the day that passed yesterday") as larger time intervals, either as exactly 1000 years or as any longer time intervals. Riley construed a strong contrast between true science and mere scientific hypotheses – a contrast that is today still effective in the background when evolution theory is dubbed "hypothesis" or "mere theory". William Jennings Bryan (1860–1925), a democratic politician who ran three times for US-presidency without success and once became secretary of state, diagnosed "Darwinism" as the main cause for growing faithlessness, as a threat for democracy and Christianity, and as the true cause for the World War I. He mounted country-wide campaigns against evolution theory in biology classes and therewith started a movement that lasts until today.

The political campaigns of anti-evolutionists met their first successes in the mid 1920s. Three states (Tennessee 1925, Mississippi 1926, and Arkansas 1928) prohibited teaching evolution theory in biology classes, and other states restricted the use of school books with chapters on evolution. It was judged "inappropriate" and "pernicious" for academic education. Bryan and his fellows extended their campaign to the rigorous prosecution of the new laws. The most famous episode concerned a Tennessee high school teacher named John Thomas Scopes (1901–1970), who was arrested and put on trial for having held a biology class on evolution

theory at a high school in Tennessee. The trail evoked an enormous press echo, partly due to American society's splitting into a liberating movement in urban regions and a traditionalist-minded moralism in rural regions. The trial made its way into American history as the "monkey trial". In public opinion, it ended with a "moral victory" of the "evolutionists" even though Scopes was fined. Tennessee became a synonym for "benighted" and Arkansas gave its name to a new subspecies: the "homo nesciens arkansas" – the ignorant Arkansas man.

In the following times the attempts to establish Creationism in schools fairly receded for the Creationist "scene" suffered from fragmentation. This was not changed by the many newly founded Creationist "societies for religion and science" either. Their social influence was limited to attaining a cutback of some chapters on evolution theory in school books or a "marking" of them like: "Darwin's theory, like the one of Lamarck, is not generally accepted."[3]

The late 1950s saw a revitalization of the debate. A theater play and a film were made about the "monkey trial". The Russian satellite "Sputnik" produced a new interest in science and technology and that, in turn, lead to reconsiderations which scientific topics should be taught in public schools. Many parents in the mid-west of the U.S. did not want their tax dollars to be used for "indoctrinating" their children against the bible. A 1960 public poll showed that 94% of the Adventists and 91% of the Assemblies of God were opposed to evolution theory. New publications put forward the full spectrum of Creationist theses.[4] On the other side, the American Institute of Biological Sciences published the school book *Biological Science: Molecules to Man*, and the U.S. Supreme Court judged the Arkansas anti-evolution law unconstitutional.

In reaction to that, the Creationists inaugurated a new strategy, namely, to supplement their critique on evolution by broad attempts to argue scientifically for Biblicist "theories". The new headword for the movement was "Scientific Creationism" at first, before it was changed into "Creation Science" in order to emphasize the pretense to do science. Put into a recipe, it was: take the Genesis-story as a factual report, eliminate all religious elements from it ("God", "creation", "6-days'-work", "Noah's ark", and the like), form a corresponding scientific-looking theory, take in only the supportive empirical evidence, put the resulting dough into the oven of school book publishers and enforce it to be served as a side to every piece of evolution theory. – This caricature has a serious point, namely, that Creationists tried to establish "Creation Science" in schools by arguing: Creationism is a competitor to evolution theory, so neutrality of the state and equality of rights demand to teach both theories equally. High court's decisions crossed out this line of argument for Creationism not being a scientific theory.

Nevertheless, this strategy had some success like the Californian Board of Education's 1969 decision that "Creation Science" had to be taught equally to evolu-

[3] See the school book "Dynamic Biology" of Arthur O. Baker and Lewis H. Mills (New York 1933).

[4] See, for example, Morris/Whitcomb 1961.

tion theory. A public poll about what should be taught in schools showed in 1981 that 75% were in favor of both and 10% in favor of Creationism only. Not more than 8% of the Americans opted for evolution theory only.

The 1970s saw a large number of Creationist institutions being founded, and in 1974 the first school book called "Scientific Creationism" appeared in print. Interestingly, there were two editions of this book: one for public schools without any biblical references, and another one for Christian schools with a chapter on the "creation according to scripture". In order to emphasize the alleged scientific character, they appealed even to Popper's principle of falsification and Kuhn's concept of science as competition of theories.

The idea of so-called "balanced treatment" pervaded U.S. politics deeply. In the presidential election campaign in 1980, later US-president Ronald Reagan said: "If evolutionary theory is going to be taught in schools, then I would think that also the biblical theory of creation, which is not a theory but the biblical story of creation, should also be taught." To call for equal rights was surely the best strategy as to what concerns the American mentality.

In 1980, Arkansas and Louisiana stipulated the "balanced treatment" of evolution theory and "Creation Science" in schools. The Arkansas law defined "Creation Science" – notabene: a state law determines what is to be understood by a supposedly scientific theory! – noting the following characteristics:

- Sudden creation out of the void
- Mutation and selection do not suffice as explanations for the development of life
- Change takes place only within biological species
- No common tree of descent of men and apes
- Geological evidence is explicable by the assumption of a great flood
- The age of the world is fairly small.

Later, high court jurisdiction in the U.S. took over these seven characteristics and even ID supporters refer to them when they attempt to contrast ID with "Creation Science".

The Arkansas law was judged to be unconstitutional in 1982 for that "Creation Science" is not science and that evolution theory says nothing about the existence or non-existence of a creator. In 1987 US Supreme Court judged also a similar Louisiana law to be unconstitutional for that "Creation Science" serves religious purposes and not scientific ones.

Since the 1980s, this legal interpretation consolidated. "Creation Science" is regarded as unscientific and associated to religious objectives. Therefore, Creationists' chances to pursue their aims by law faded away. Creationism was confined to local actions. Their focus was then on local "school boards" through which the U.S. parents exert a strong influence on school matters. In the mid-1990s, a new wave of allegedly scientific works under the title "Intelligent Design" arose. What their relation to Creationism is will be discussed in the next section.

3 Intelligent Design and Creationism

"Intelligent Design" means a body of thought committed to the thesis that the structures of the empirical world can be best explained by appeal to an intelligent overall-cause and not as results of an undirected, arbitrary process.

This working definition shows some important characteristics of ID: an anti-evolutionist thrust, a resemblance to scientific methodology (analyzing structures and patterns of empirical reality, searching to explain them by laws and causality), and a special emphasis on the explanation of *intelligent* life and of *complex* structures as should give rise to conclude an *intelligent* cause. A less scientific point is ID's claim to exclusiveness, i. e., to offer the best explanation of the structures of reality allowing only for slight improvements in the future.

The different variants of Creationism have in common their historico-literal reading of the Bible. They are set against evolution and hold that the variety of species cannot be explained by natural selection, but rather be put down to special acts of God. Some Creationists, however, believe in an individual act for each species, while others hold that all species have been created in one single act. "Day Age theory" conceives the days of creation from the Genesis narrative as longer periods of time, and "Gap theory" assumes a big time gap between the creation of the world from vain and the creation of life as told in the Genesis narrative. Some Creationists even assume Noah's big flood to be an historical event.

In a certain way, ID people are surely right when they claim not to be Creationists, because there are obvious differences between both doctrines. Creationism is explicitly bond to the Bible whereas ID is not. But there are also obvious similarities like the anti-evolutionist orientation, so that the question arises how big the differences really are. In terms of a famous cartoon one could ask whether ID is not the creationist wolf in a sheep's clothing. One should keep in mind that, even if ID supporters had the same goals as Creationists, they would have to hide them in order to avoid the legal problems Creationists had.

A first link between ID and Creationism consists in an institution. Since its founding in 1990, the Discovery Institute in Seattle became the leading institution in propagating Creationism, financially backed by wealthy evangelical circles and strongly anchored in the "religious right". In 1996 this institute established a new department named "Center for Renewal of Science and Culture" (CRSC) with the task to spread Creationist ideas, especially in education. Though, to speak of a "renewal" was counterproductive to the attempt to establish "Creation Science" as a scientific alternative to evolution theory for it imposed the suspicion of a non-scientific motivation. So the center was renamed into "Center for Science and Culture" (CSC) and as such it exists until today. Changing the name, however, did not mean to change the objectives. According to an internal strategy paper, which became know as the "Wedge paper" in 1998,[5] the CSC wants to "defeat scientific materialism" and "to replace materialistic explanations with the theistic under-

[5] See http://www.geocities.com/CapeCanaveral/Hangar/2437/wedge.html (10. 04. 2007).

standing that nature and human beings are created by God." The Center explicitly named it a five year goal to "see intelligent design theory as an accepted alternative in the sciences and scientific research being done from the perspective of design theory". So, the same institute which was initially founded to propagate Creationist thoughts later became a major supporting institution of ID.

ID and Creationism also share the intention to place an alternative theory to evolution which is compatible with a historic-literal reading of the bible and a corresponding idea of creation. ID exponents like William Dembski, however, frequently emphasize that this compatibility is a *result* of their scientific endeavors (concluding an intelligent cause) and not its starting point as it is in the case of Creationism (stipulating a supernatural creator).[6] On the surface of the matter, this is fairly correct. Usually in ID arguments, no religious presuppositions are required. But the question is whether the proposed arguments are not still ideology-driven. Religious commitments may play an important role in fixing the goals of the alleged scientific theory even if they are withhold to present the resulting theory as a scientific and religiously neutral one. The institutional links discussed above speak very much in favor of that. According to Dembski, ID and Creationism differ in that "ID nowhere attempts to identify the intelligent cause responsible for the design in nature."[7] Two important objections to this claim (lack of scientific character and explanatory insufficiency) will be discussed in Section 4. If these objections are true, they show ID trying to get rid of certain problems just by hiding problematic parts of the theory and leaving appropriate gaps which, once the theory is accepted, could be filled with the old religious stipulations. It is not only Creationists who "usually" conceive the supernatural agent as the transcendent-personal God of Christianity. Of course, Dembski is right, ID refrains from answering the questions for the nature of the intelligent world cause, assigning it to the domain of philosophy and religion. But "usually", ID people too will understand this intelligent cause as the Christian God for their theories always have exactly fitting gaps.

The continuity between Creationism and ID is confirmed by the similarity of their goals. In most cases, these goals are hard to find out for ID exponents seldom disclose them. Still there are few statements like the following one by Dembski: "Indeed, once materialism is no longer an option, Christianity again becomes an option." Even if Dembski literally speaks only about relations between different "options", this statement shows the same intention as the "Wedge Paper": to defeat Materialism and to establish (pseudo-)Christian (pseudo-)alternatives.

So ID originated both, in what concerns its objectives and in what concerns its organizational structures, in the environment of Creationism. Many people who had supported Creationism are now fostering ID. In historical background stands that Creationists' political ambitions in the U.S. failed for their anti-evolutionary

[6] See Dembski 1999, 247: "Scientific creationism has prior religious commitments whereas ID does not."

[7] See Dembski 1999, 247.

theories being judged to be unscientific – a clear motivation to "try again" with ID. One of the objectives of Discovery Institute's initiative ID was to "replace atheistic interpretations". ID does not make detailed claims about the nature of the intelligent cause they advocate, but they leave the blanks very deliberately. It is not by chance that religious entities fit well into these blanks.

4 Arguments

In this section three arguments for and seven arguments against ID are discussed. They are not ordered according to their importance.

4.1 Pros

4.1.1 Analogy to usual design inferences

If an archeologist finds a statue, he concludes that it is not an arbitrarily formed piece of stone or wood, but that it has been designed. Similarly, we all proceed in our everyday lives when we have buttons to press, levers to switch and so on. We take those objects not to be arbitrary natural objects but to be artifacts designed for a special purpose.

In analogy to that kind of reasoning, ID people want to infer from the structures of the empirical world that it has been designed. Therefore they use three criteria for design: contingency, complexity, and specificness or irreducibility. If these are plausible criteria in cases of human design, then, so the argument goes, these criteria will generally allow concluding design from structures in the empirical world, even in case there cannot be a human or natural designer.

This kind of analogical reasoning has two flaws: the criteria seem to be inadequate already in the human / natural domain, and there is few if not zero evidence for transferring the design inference from the human / natural domain to cases in which a human / natural designer cannot exist.

To the first point, consider the notion of complexity. ID exponents like William Dembski specify complexity as to be measured by improbability: the less probable an event is, the more complex it is. But is improbability really a criterion for design? Take the German "Lotto" sweepstake. The probability to hit the jackpot is very low, approximately 1 to 140 millions. But nevertheless nobody would conclude from their improbability that last Saturday's "Lotto numbers" were intentionally brought about or designed. The mere improbability of a particular event is not a reason for its being intended.

The second point concerns a general problem with transfers by analogy. The question is whether there are enough similarities between the two sides of the analogy in order to justify the transfer. This is particularly unclear in the case of human vs. supernatural design, for designing is usually seen as a typically human activity. Furthermore, we have gained certitude with design inferences in our everyday lives

by try-and-error procedures, by success and failure in reaching goals, and by accordingly adjusting our system of beliefs. This is not the case in the domain of supernatural design. Therefore, hasty inferences by this analogy are highly questionable if not completely implausible.

4.1.2 Irreducible Complexity

Michael Behe, a biochemist and ID exponent, has coined the notion of "irreducible complexity". A system is irreducibly complex if every part of the system is indispensable for the system's functioning. If one of the parts was removed, the system would cease to work.

From the definition of an irreducible complex system it seems to follow that an irreducibly complex system cannot emerge stepwise from precursors. Behe's argument runs as follows:

(1) Animals have irreducibly complex systems (e. g. organs).
(2) Irreducibly complex systems cannot emerge stepwise from precursor systems with the same function.
(3) Ergo, animals cannot have been created by an evolutionary process.

This argument has serious flaws. A first one concerns the equality of its middle term and, in connection with that, the truth of the premises. Premise (1) seems plausible at first sight. There are organs with so complex a functional structure that they cease working if one removes one of their parts. But this initial plausibility is due to a weak reading of "irreducibly complex". Thesis (2), in contrast, gets support only from a strong reading which ensures that irreducibly complex systems cannot develop from precursors with the same function. Some biologists, however, have provided evidence that, under this strong reading, premise (1) is empirically false. So one gets caught in the following dilemma: Either one takes "irreducibly complex" in a weak sense, so that it is surely empirically detectable, but then thesis (2) is unfounded, or one takes "irreducibly complex" in a strong sense supporting thesis (2), but then it seems not to occur in the empirical world. The whole argument hinges on this dilemma.

Further questions challenge the conclusiveness of the argument. Why do precursor systems have to have the *same* function as the system itself? Is it not conceivable that the change of an organ part changes the function of the whole organ just a little? Then, thesis (2) does not lead to the negative conclusion (3) for there being other possibilities of stepwise development.

What if a system has *become* indispensable, if, for instance, a modification of another part has made it so? (Consider the system of a kitchen with a second, superfluous cooking pot. If the first pot is broken or lost, the second pot becomes indispensable for the system's function.) Then the irreducible complexity of the later system, which is the one found in empirical reality, is not a reason against it having gradually evolved.

Or consider the case that each of two subsystems produces half the amount of a certain substance needed for the functioning of the whole system. Such a system is

irreducibly complex as it requires both subsystems. Nevertheless one of the subsystems could by and by take over the function of the other one, just by producing more and more of the substance. This scenario shows again that stepwise development would be possible even under the conditions of irreducible complexity.

In conclusion, there is no valid inference from irreducible complexity to non-evolution, if irreducible complexity exists at all. The initial plausibility of Behe's argument seems to be due to the limitations of our imaginative powers: it is hard to imagine complete chains of intermediate steps in an evolutionary process over millions and millions of years. That gaps in the picture are hard to fill, does, however, not mean that the picture is false. Such were a fallacy from the epistemological to the ontological level.

4.1.3 Fine-tuned universe

Another argument for ID operates with the notion of a "fine-tuned universe". It starts from the observation (?) that the natural laws and the natural constants are very precisely adjusted to the values they have. The development of complex forms of life on earth was possible only under these circumstances for the tiniest variation of the values would have resulted in environmental conditions hostile to the development of life. From these considerations they conclude that those laws and values must have been set by an intelligence.

Arguments of this kind involve a huge amount of problems which cannot be dealt with in detail here. What should it mean to say of a constant that it is "adjusted"? Is there any sense in talking as if natural constants are some sort of variables that get their values by some sort of assignment? (Is there any example in the natural sciences for such a "variable natural constant"?) Generally speaking: What does it help for our understanding of the world if we know that it would be different if it were different?

Even if one grants the premise for the sake of the argument, it is not plausible to maintain that this would have excluded the development of life on earth. Why would it be unimaginable that life had developed in different forms than it did? Why not think of "organic" molecules in which silicon takes the place of carbon? In that case, different circumstances would even have been needed for life to develop.

Finally, it is conceivable that at some later stage in the development of physics a more uniform theory of the world is found and that in this theory the various "old" natural constants turn out to be depending on a few or even only one "new" constant. Natural constants are theory-related in a way that precludes immediate inferences from the fact that they have a certain value.

4.2 Cons

4.2.1 *God-of-the-Gaps*

If we know that the events A, B, C und D are causally related in the form of the chain A → B → C → D then we call such a chain "closed". If we do not know all of the causal relations, there may be gaps in the chains, e. g. A → B *gap* C → D. The notion of causality asks, of course, for closed chains without gaps. What if a natural causal link between B and C is not known yet? Some religious scientist may be tempted to insert a supernatural cause instead. The problem with such a procedure is obvious: Where natural causes suffice, supernatural ones are unnecessary and have to be avoided (Occam's razor). But how do we know that natural explanations will always do?

A nice illustration of the God-of-the-Gaps-fallacy is given in Daniel Defoe's' "Robinson Crusoe". When Crusoe finds an old-English barley on his lonely island he firstly concludes that this must be a work of divine grace for him. Some times later he remembers, however, that it was exactly the place where he had shaken out a package of chicken feed, and immediately he prefers this natural explanation to the supernatural one. It is interesting to note that Crusoe does not renounce his belief in the divine grace. For him, it was the divine providence that had made him shaking the package out exactly in the place with the best weather conditions, and it was divine providence that had made the rats spare some of the seEds. – This story illustrates how a supernatural explanation "naturally" becomes questionable when a natural explanation is found. Plugging God into the gaps of causal (or other natural explanatory) chains may result in the opposite of what was intended. It generates a drive to naturalizing, as one will prefer the natural explanation as soon as it is at hand.

From the point of view of Christian theology one has to ask: Can we really conceive God's acting in the world like a naturally working cause in the midst of the network of natural causal chains? Christian theology traditionally holds that God's acting is always mediated by secondary causes and never isolated from them. With this view it seems incompatible to make God into a secondary cause amongst others.

4.2.2 *Mixing causality levels*

Generally, one can distinguish two levels of causal explanations. *Physical* or generally scientific descriptions and explanations are located on a level E_1. Events and (natural) laws are the important tools at this level and the type of causality is "event-causality". By contrast, *subject-involving* descriptions and explanations, like ethical or aesthetical ones, form a different level E_2 of "agent-causality". Both levels are surely related but the relations are not completely clear. In most cases the alleged relations can be made explicit only in form of metaphors or narratives. There are few if any linking concepts between the two levels. ID theorists, however, tend to mix up the two levels and try to explain phenomena described on E_1 by explanations on E_2.

4.2.3 *Disservice to theism*

ID or any kind of Creationist position respectively presupposes that difficulties in science count as reasons against scientific explanations and for immediate divine interventions. This involves a problematic "logic of thought": If the difficulties are brought to bear for God, then it is plausible to see scientific success as speaking against Him.[8] Can a truly Christian belief in creation really be a rival of science in general and of evolution theory in particular?

Another problem is that the notion of "design" suggests a completed, a finished construction, whereas the Christian belief in creation comprises incomplete- or openness (cf. the theological concepts of *creatio continua* and *creatio nova*), and of an involvement of God in the world (*cooperatio Dei*).

Furthermore, the basic ideas of ID can be illustrated by very simple mechanical examples. This makes it very easily digestible for simple minds. It also shows the mentioned mechanical conception of creation which is in considerable tension with Christian theology. Christian doctrine has it not that God relates to creation like a watchmaker to a watch. Theology of creation does not celebrate Gods "skillfulness" but his universal power of live and his faithfulness.

In sum, ID does a disservice to theology insofar as it gives rise to an unnecessary opposition of science and Christian faith, and it disseminates ideas that are not compatible with Christian faith.

4.2.4 *Anthropomorphism*

It is plain that human beings use human concepts and ideas for everything one can think of. Problems occur, if a notion "impregnated" with too many human connotations is used for a non-human domain like the divine. From this standpoint, one can criticize ID's concept of an architect- or a watchmaker-God.

The problems with the design inference by analogy discussed above (4.1.1) strengthen this critique. When ID concludes an intelligent cause from the structures of empirical reality by means of an analogy to natural design, this conclusion is justified only because of certain commonalities among the two poles of the analogy. But that means that it is valid only, if natural designers and the intelligent designer have enough in common, as it is plausible if the intelligent designer is conceived of as a watchmaker, an architect, or some other craftsman. This is not only in tension to Christian notions of God and creation, but also anthropomorphic: it transfers to God ideas or pictures that are tied too much to their human prototypes. In this respect, Ian Barbour is right saying: "Intelligent Design is not very intelligent. It is, taken literally, a case of insulting God."[9]

[8] So argues, for example, Kenneth R. Miller in the section „Searching the Shadows" of his book *Finding Darwin's God*, (New York 2000), see online http://brownalumni magazine.com/storydetail.cfm?Id=1838.

[9] Verbal statement on a conference in Philadelphia, 02. 06. 2006.

4.2.5 *Lacking scientific character*

The strongest objection to ID is that it is unscientific. So, for instance, the *US National Academy of Sciences* published a statement saying: "Creationism, intelligent design, and other claims of supernatural intervention in the origin of life or of species are not science because they are not testable by the methods of science." This statement does not only concern the scientific assessment of ID, but also its political and legal strategy. It was quoted in the opinions of the *US Supreme Court* when it decided that Creationism and ID cannot appeal to the principle of equality in order to get their doctrines taught at school. To the contrary, the court said, Creationism and ID are theories stemming from religious world views, so that teaching them in schools would contravene the neutrality precept of the American constitution.

In order to decide whether ID is science or not, one needs criteria for science. Which criteria to take, how exactly to formulate them, what their interrelations are, and how to apply them, are lively debated questions in the philosophy of science. While there is no consensus in detail, some criteria are at least broadly accepted. The more or better something fulfills the criteria, the more is it acceptable as science: consistency (internal as well as external), economy (concerning entities and explanations, cf. Occam's principle), usefulness (description, explanation, prediction), empirical testability, falsifiability, a broad basis of observational data (e. g. repeatable experiments), correctability and dynamic (new data lead to changes), progressiveness (no fall back behind preceding theories), caution or modesty (taking into account the possibility of improvement instead of promising false reliability), scientific self-control mechanisms (peer review), ideological neutrality, and so on. For most of these criteria it is doubtful whether they are met by ID. This cannot be discussed in further detail here. One point may be worth noticing, however. Whilst a theory can sometimes be *made* to look like fulfilling many of these criteria, an important question is how one arrives at a theory. In the eyes of ID supporters, ID starts from empirical data and uses nothing but scientific methods to conclude an intelligent cause of the empirical world. In the eyes of ID opponents, however, ID starts from a Creationist position, which was experienced as unenforceable. Then, the framework of a scientific theory is obtained by crossing out the explicit religious or world view references. The observations are brought into line with this framework. If necessary, evidence is withhold or reinterpreted. The result is a scientifically "designed" theory that can cope with empirical data and that has the proper gaps to be filled by Biblicist doctrines of creation. The divergence between both views shows that although ID theories may be designed as to look scientific this does not mean that they really are.

ID exponents like William Dembski hold that ID is science for it makes use of the following inference that is justified according to scientific standards:

(1) Specified Complexity (SC) occurs empirically.
(2) Natural causes cannot explain SC.
(3) An intelligent cause can explain SC.

Each single step is justified, Dembski says, and the whole procedure is as methodologically controlled as one asks science to be.

Generally, one can object once more that not everything that can "ex post" be made to look like a scientific method really comes from scientific methods. To be sure, if certain additional conditions are fulfilled (e. g., some sort of metaphysical principle of causality according to which everything that occurs empirically has a cause), Dembski's syllogism is more or less correct as it stands. But the fact that one can put some elements of a "theory" in form of simple syllogisms does not make them scientific.

Like in the case of the "irreducible complexity" argument, one can call into question all of the three premises as well as the conclusiveness of the argument. That should not be done here again (see section 4.1.2). But it is worth noting that the concept of SC is problematic. Identifying complexity with improbability makes complexity precise but still arbitrary (an event is complex if it is less probable than $1{:}10^{150}$. Why 150?) and is, as it stands, not sufficient for the inference to design. Specification on the other hand remains underdetermined. So, for example, Dembski says that the letter "A" is specific but not complex, a letter muddle like "ABLKJEVNFMDGDN" is complex but not specific, and a sentence like "Dembski is right" is complex as well as specific. In applying these notions, Dembski uses interpretive functions that map the possibly specific complex information to a form in which the specification can be demonstrated (e. g., a function that maps "HEHHHE" onto "101110"). But then it seems reasonable to assume that for every given structure and every precise version of the notion of specification one can construct counterexamples by a clever choice of such a function, that is: if Dembski presents a precise definition of being specific and an example for something unspecific one could make up an isomorphism such that the image of the unspecific becomes something specific.

An additional objection to premise (3), namely whether an explanation operating with an intelligent cause of the world is acceptable as an explanation at all, will be discussed later.

In conclusion one can say that the central notion of the alleged methodologically controlled procedure – under the conditions discussed – is imprecise, arbitrary, and underdetermined, so that the alleged inference must be seen as a *non-sequitur*.

If steps (2) and (3) are correct, they allow for an interesting little argument: if, by thesis (2), natural causes cannot explain SC, but the intelligent cause can, then the intelligent cause cannot be a natural cause. Under the premise that every cause is natural or supernatural it follows that the intelligent cause must be supernatural. Furthermore, design implies intentional acting. Hence, the intelligent cause of ID would be a supernatural agent, and Dembski's distinction between ID (inferring an intelligent cause) and Creationism (presupposing a supernatural agent) would melt down to inferring versus presupposing the agent. But if this were the only difference, than the suspicion of ID being only designed as if it were an edifice of inferences would be strongly intensified.

4.2.6 *Utilizability in politics and for religious aims*

A further objection to ID concerns the political, legal, and religious aims that are pursued with the help of ID. Originally, it was Creationism's strategy to appeal to a principle of equality in order to influence the teaching curricula. This strategy failed for Creationism not being a scientific theory at all. But ID allegedly is, so it can be used to reanimate the failed strategies and can be criticized for its ideological background.

4.2.7 *Immanent critique of the design hypothesis*

There rarely is some immanent critique of the design hypothesis. So, for instance, Zoologist Jerry Coyne (born 1950), asked: Is it really *intelligently* designed that vitamin C synthesis in humans is potentially laid out but not actually working? Is it really *intelligently* designed that certain islands are optimally suited for certain forms of life but are nevertheless uninhabited? Is it really *intelligently* designed when flora and fauna of certain islands and the nearby coastal region are almost identical even if there are completely different environmental influences?

ID exponent Michael Behe has reacted to these questions. He declared them unanswerable for we do not understand enough of the designer's thoughts and aims. Such an argument allows to get rid of many objections by an immunization that in turn strengthens the doubts about the scientific character of ID.

4.2.8 *Explanatory deficiency*

If ID exponents want to take advantage of the justification of inferences like the inference to the best explanation, they have to be submitted to standards that allow valuing the quality of explanations. It is neither claimed possible here nor asked from the ID supporters to identify unique and uniform such standards or that such were necessary. But certain basic principles are indispensable, for instance "Occam's Razor" or an (intuitive) access to quality degrees of explanations.

According to these considerations, another objection against ID can be formulated: *Even if* ID was a theory that can cope with the facts and meets scientific requirements, there would remain an immense lack of explanation, namely the "figure" of the designer. When ID supporters claim that their theory is scientific while "Creation Science" is admittedly not, then they rely on the fact that their explanation makes no use of religious elements and leaves the intelligent cause of the world unexplained. But if this is correct, then ID uses at the very heart of its body of thought an unexplained (and for ID even unexplainable) entity. How is the explanatory power of such a theory to be valued?

5 Conclusions

The preceding discussions have shown that ID is not a convincing theory. It cannot keep its promise to be a scientific alternative to evolution. The arguments for ID cannot make their case, and their counterparts are not convincingly disproved. The evidence for evolution theory is so persuasive that one might follow Jerry Coyne in his résumé: "Either life resulted not from intelligent design, but from evolution; or the intelligent designer is a cosmic prankster who designed everything to make it look as though it had evolved." [10] Contrary to the first impression, ID does not even support a genuine Christian belief in world's creation by God.

There are nevertheless some lessons to draw from the discussion about ID. From a political point of view one could try to newly recognize the advantages of the traditional German education system. U.S. scientists are more and more confronted with religious radicals, and one aspect of the dissatisfying situation is surely that theology in the U.S. is usually banned to the secluded atmosphere of seminaries and not, as in Germany, taught at universities where students and teachers are permanently in touch with other academic disciplines.

5.1 ID as stimulus for Theology

The fascination of ID for many people is at least partly due to the fact that it presents Christian faith as a theory that can be maintained even in scientifically oriented times. Furthermore, it seems to save Christian faith by backing it up with alleged scientific methods and results.

If all of this is only appearance and if, as was argued before, ID does not truly support Christian belief in creation, it can nevertheless be taken up fruitfully. The public interest in ID can serve as a stimulus to further develop a Christian theory of creation that is not against or aside science, but that processes and incorporates true scientific results in a theological framework. It would be necessary, then, to elaborate further how the concept of a continuously creatively acting God can be brought together with evolution biology's conception of a far-reaching evolutive process in the world. Is it not conceivable, that God acts through natural selection processes? To be sure, for such aims ID is not necessary. But it could be taken as a model on which one can study how such fittings may look like, which aspects of it are desirable, and which are not.

Further discussion of the theological problems with ID would certainly lead to deeper insights into theological topics, so, for example, if God's acting in the world is considered. Some new light may be shed to a traditional doctrine like the Thomist one which conceives God as acting as a primary cause, mediated by secondary causes. How does this doctrine fit together with the natural sciences' account to the "secondary causes" of the empirical world? – For that, it would be

[10] Coyne 2005.

necessary to delineate as exactly as possible where the transitions from science to world views take place.

5.2 ID as exhortation for Biology

ID exponents surely push things too far when they defend arguments that resemble proofs of the existence of God and claim these to be science. Maybe sometimes as a countermove, scientists also cross the borderlines of their disciplines when they not only advocate science but also its interpretation in specific world views science should be neutral in respect to. This was clearly visible in the different statements scientists made in reaction to Cardinal Schönborn's article in the New York Times. If Biologists do not want to make the same mistakes as their "opponents", they should reassure themselves of some principles one may call the "ethos of science". Biologists should be asked not to depreciate the quality trademark "scientifically proven" by using it ideologically. They have to restrict their own assertions to the domain of science proper, to be methodologically world view neutral, and to keep their own results open for different, world view bound interpretations. As long as theology highlights a true interest in the results of science and accepts them as they are, a biologist in turn should have nothing against a theologian who goes beyond those results in integrating them into his theological perspective. If such an interpretation is explicitly disapproved by a biologist, other biologists should draw their colleague's attention to the non-scientific presuppositions he used in order to come to his conclusion. Is it capable of compromise that world views and world view guided conclusions from scientific results are about reality and truth as is science itself?

5.3 A philosophical question to Biology and the Philosophy of Science

In the background of the ID debate stands a question central to natural philosophy: What about usefulness and goal-directedness as elements of scientific explanations in the natural sciences and especially in Biology? It seems that a science like Biology cannot be restricted to the purely mechanical view of nature that Bacon, Leibniz, and other philosopher-scientists have imposed on modern science. Behavioural research, the rationalization of animal behaviour and, quite generally, the ascription of mental states to animals actually go beyond a concept of science that has completely excluded the talk of final causes, i. e., of causes that act to a certain ends – something which played an important role in Aristotle's philosophy of science and is indispensable in all the humanities. The refusal of the concept of final causes has left a gap that concerns Biology much more than other natural sciences. Philosophers of science should scrutinize this point much further, and Biologists have to bring out how much talk of "final causes" they have to rely on. Why not think about the reanimation of a concept believed to be dead?

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