INTELLIGENT DESIGN – THE NARROW WAY FROM INFORMATION TECHNOLOGY TO SCIENTIFIC ANTI-EVOLUTIONIST THEORY BY MATHEMATICAL DEMONSTRATION

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Abstract

The evolution of computer technology in the last several decades allowed a few open-mind scientist to overtake the meaning of an IT feature – design – and translate it into scientific language, by denominating a new, daring theory of the origins of life, contradicting the already accepted and pre-supposed theory of evolutionism created by naturalist Charles Darwin over a century ago. One of the founders of this theory, mathematician William Dembski, uses statistic algorithms to unlock the criteria for establishing whether something is "designed" or created by pure chance or the randomness of nature`s laws.

Key-words: *intelligent design, recognisable pattern, probability, specificity, irreducible complexity*

Roots of Intelligent Design

In 1993, Phillip Johnson, professor at University of California, invited a few specialists in sciences of nature, law, philosophy, medicine etc. to a debate-session regarding origins of life on Earth. They were all sharing the same discontent about evolutionary theory and, especially, the explaining of beginning of life given by Darwin in his "Origin of species by means of natural selection". They tried to sum up the updated information, by giving up to any prejudges, including the scientific ones which are the base of methodological naturalism. One of the points which they were supposed to take apart was that creationist-type explanation was totally unscientific. So, it took place the birth of a new scientific current of opinion, named Intelligent Design, a term which was previously used in computer science and information technology, in the COD (Computer Aided Design) systems.

While usually admitting that life on earth is billions of years old and that people, pigs, and petunias are related by common descent, the Intelligent Design (ID) movement maintains that some bits of biology show the unmistakable handiwork of an intelligent agent. And while this agent may not wholly displace Darwin, the two at least stand shoulder to shoulder. The ID movement further maintains that intelligent design, as a legitimate scientific hypothesis, deserves a place alongside blind evolution in public schools and that students should, at the least, be exposed to both sides of the debate. Indeed Ohio, which is revising its curricular standards, is currently embroiled in a dispute over the possible introduction of intelligent design into its biology classes. (Texas, which dominates the U.S. textbook market, is gearing up for a similar dispute next year.) The ID movement is led by four tireless academics or ex-academics: Michael Behe (professor

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of biochemistry at Lehigh University), Jonathan Wells (biologist and senior fellow at the Discovery Institute, a Seattle think tank concerned with the "renewal of science and culture"), Phillip Johnson (professor emeritus of law at Berkeley), and William Dembski (associate research professor in the conceptual foundations of science at Baylor University and senior fellow at the Discovery Institute).

What is CAD?

Computer-Aided Design is the use of computer technology for the design of objects, real or virtual. CAD often involves more than just shapes. As in the manual drafting of technical and engineering drawings, the output of CAD must convey information, such as materials, processes, dimensions, and tolerances, according to application-specific conventions. CAD can be used to design curves and figures in two-dimensional (2D) space; or curves, surfaces and solids in three-dimensional (3D) objects.

CAD is an important industrial art extensively used in many applications, including automotive, shipbuilding and aerospace industries, industrial and architectural design, prosthetics and many more. CAD is also widely used to produce computer animation for special effects in movies, advertising and technical manuals. The modern ubiquity and power of computer means that even perfume bottles and shampoo dispenses are designed using techniques unheard of by engineers of the 1960s. Because of its enormous economic importance, CAD has been a major driving force for research in computational geometry, computer graphics (both hardware and software), and discrete differential geometry.

Introducing knowledge within design

During the second part of the eighties, intelligent design was based on introducing and using knowledge within the design tools. In 1989 it was considered that the term intelligent CAD is understood as an environment to support the designer`s intellectual activities which contains tools with built-in design knowledge. The word `intelligent` in “intelligent design” must be interpreted as providing the possibility to manipulate and extend the amount of knowledge stored in the system. The amount of knowledge stored in the system may be divided into three categories: (1) domain specific knowledge, (2) procedural knowledge, (3) meta-knowledge.

In practice, intelligent design was developed along three axes:
(1) Introducing mechanisms from artificial intelligence into CAD environments;
(2) Coupling CAD tools with expert systems;
(3) Developing new des
(4) ign tools from artificial intelligence bases.

Criteria for design

Therefore, by taking over the meaning of `intelligent design` used in computer science, mathematician William Dembski enounces, in his book, `*The Design Inference*`,

a series of empiric criteria to establish if something was “designed”. The two basic criteria are low probability and specificity, another feature which can make the distinction between creative intelligence and the result of randomness in nature. In the book, Dembski talks about recognizable patterns. A few examples of such patterns are: the sculptures of faces of the four american presidents on the Rushmore mountain in South Dakota, the inscriptions any kind (on walls, trees, sand, grafitti) – like “John loves Mary”, or the softs that can be installed on computers. An example of science that operates with such patterns is archeology. By far, the most impressive example of such patterns is the DNA. All these are generators and transmitters of codified information. But, unlike the other two entities of science, information cannot be generated otherwise but by a creative intelligence, either man, either God. There is no natural, accidental cause, capable of producing information.

As follows, Dembski, whose new book, *No Free Lunch*, is sure to ignite new firestorms over design vs. Darwin, is perhaps the most impressively credentialed of the lot. An object, event, or structure exhibits specified complexity if it is both complex (i.e., one of many live possibilities) and specified (i.e., displays an independently given pattern). A long sequence of randomly strewn Scrabble pieces is complex without being specified. A short sequence spelling the word “the” is specified without being complex. A sequence corresponding to a Shakespearean sonnet is both complex and specified. Dembski argues that biology is replete with specified complexity. It is certainly true that organisms are fantastically complex. It is also true that in some ways (but not others—this will become an issue) they are specified. It is clear for instance that the various parts of an organism are fitted to each other: the curvature of the lens is fitted to the distance to the retina so as to produce a sharp image.

Proving specificity step by step - Dawkins's algorithm

Dembski spends a great deal of time formalizing specified complexity in the language of information theory. Roughly speaking, we know we have a case of complex specified information if out of all possible ways of putting together a set of elements — say, all possible sequences of a set of letters and blank spaces — only a small subset represents a prespecified target and the actual outcome belongs to this target. Meaningful English phrases, for instance, represent a small target: the overwhelming majority of random combinations of English letters and blank spaces yield gibberish. So if you see a meaningful phrase (as you hopefully are now), you're seeing complex specified information. Now it's obvious how we go about making meaningful phrases: we use intelligence and crank them out at will. Biologists explain the complexity that resides in organisms by Darwinism. To get a feel for what this means, consider the following caricature of Darwinism offered by Richard Dawkins and discussed at length by Dembski.

On pp. 47-48 of THE BLIND WATCHMAKER, Richard Dawkins gives two runs of his WEASEL program (note that there were typos in both initial seeds — one had 27 characters, the other 29 whereas they should have 28). The target will be Hamlet's line, METHINKS IT IS LIKE A WEASEL. First consider the odds of forming this target

sequence by blind chance, i.e., with monkeys at word-processors. Draw a random letter from the alphabet for the first position in the phrase; now another for the second position, and so on. The odds that you've spelled out the phrase METHINKS… are essentially nil: in fact, with twenty-six letters plus a blank space, the odds of getting the word METHINKS alone are already less than one in 280 billion. But now consider the following "evolutionary algorithm." Start with a random sequence as before but 1) randomly change each character that doesn't match the target sequence; 2) if a resulting character matches the target keep it and in the next round change only those characters that don't match. So, if we start with SATHINKS, at the next step we'll randomly change only the first two letters; and if those changes yield MQTHINKS, then at the next step we'll randomly change only the second letter. This two-step evolutionary algorithm of mutation plus selection arrives at the phrase METHINKS… with surprising speed. Here are the two runs using the Courier typeface, which assigns equal width to each character (spaces are represented by asterisks):

WDL*MNLT*DTJBKWIRZREZLMQCO*P
WDLTMNLT*DTJBSWIRZREZLMQCO*P
MDLDMNLS*ITJISWHRZREZ*MECS*P
MELDINLS*IT*ISWPRKE*Z*WECSEL
METHINGS*IT*ISWLIKE*B*WECSEL
METHINKS*IT*IS*LIKE*I*WEASEL
METHINKS*IT*IS*LIKE*A*WEASEL

Y*YVMQKZPFJXWVHGLAWFVCHQXYPY
Y*YVMQKSPFTXWSHLIKEFV*HQYSPY
YETHINKSPITXISHLIKEFA*WQYSEY
METHINKS*IT*ISSLIKE*A*WEFSEY
METHINKS*IT*ISBLIKE*A*WEASES
METHINKS*IT*ISJLIKE*A*WEASEO
METHINKS*IT*IS*LIKE*A*WEASEP
METHINKS*IT*IS*LIKE*A*WEASEL

These runs are incomplete. The first, according to Dawkins, required 43 iterations to converge, the second 64 (Dawkins omitted the other iterates to save space).

By using the Courier font, one can read up from the target sequence METHINKS*IT*IS*LIKE*A*WEASEL, as it were column by column, over each letter of the target sequence. From this it’s clear that once the right letter in the target sequence is latched on to, it locks on and never changes. In other words, in these examples of Dawkins’ WEASEL program as given in his book THE BLIND WATCHMAKER, it never happens (as far as we can tell) that some intermediate sequences achieves the corresponding letter in the target sequence, then loses it, and in the end regains it.

Thus, since Dawkins does not make explicit in THE BLIND WATCHMAKER just how his algorithm works, it is natural to conclude that it is a proximity search with locking (i.e., it locks on characters in the target sequence and never lets go).

This example also illustrates the idea of a fitness function. Fitness is a measure of quality; high fitness is good and low is bad. (In biology the only kind of quality that matters is how good you are at having kids. High fitness means you have a lot of kids and low means you have few.)

A fitness function is just a mathematical function that assigns a fitness value to each possible sequence. In our Hamlet example, the best sequence is the phrase METHINKS…, so the fitness function assigns it the highest value. A sequence that matches METHINKS… at every position but one gets a slightly lower fitness, and one that matches METHINKS… at every position but two gets a yet lower fitness, and so on. A random sequence typically suffers a quite low fitness. If we now pretend that all possible sequences sit in a plane, we could plot their corresponding fitness values above this plane, forming a 3-D plot. Evolutionists thus sometimes speak of fitness "surfaces" or "landscapes". Because evolution always moves from a sequence to another having higher fitness, natural selection can be thought of as moving populations uphill on fitness surfaces. In Dawkins's example this process ultimately arrives at the sequence METHINKS…, which sits atop a fitness peak.

Main Supposition

Dembski's chief argument is that Dawkins's algorithm and Darwinism generally - does not do what it seems - enter the No Free Lunch theorems. Hence Dembski's big claim: "Darwinian mechanisms of any kind, whether in nature or in silico, are in principle incapable of generating specified complexity." At best, Darwinism just shuffles around preexisting specified complexity, using up that available in the fitness function to give the appearance of producing it de novo.

It is now possible to complete the Dembskian Syllogism: Organisms show specified complexity; Darwinism can't make it; therefore, something else does and that something else is intelligence. Indeed the "great myth of contemporary evolutionary biology is that the information needed to explain complex biological structures can be purchased without intelligence." Darwinism isn't trying to reach a prespecified target, but is sheer cold demographics. Darwinism says that one sequence has more kids than another sequence and so first sequence gets common and second gets rare. If there's another sequence out there that has more kids than first, it'll displace it. But there's no pre-set target in this game.

One of these suppositions is that, in each generation of selective "breeding", the mutant "progeny" phrases were judged according to the criterion of resemblance to a distant ideal target, the phrase METHINKS IT IS LIKE A WEASEL. Life isn't like that. Evolution has no long-term goal. There is no long-distance target, no final perfection to

serve as a criterion for selection….In real life, the criterion for selection is always short-term, either simple survival or, more generally, reproductive success.

Michael Behe`s irreducible complexity

In the last half of his book, Dembski gets specific. The idea comes from Michael Behe, the ID biochemist and author of Darwin's Black Box. Behe's argument was that some structures are "irreducibly complex": remove any part and the whole thing stops working. His favorite example was the mousetrap. Take away any part — spring or hammer, say — and function collapses. You won't catch mice. Behe claimed the biological cell is also loaded with irreducibly complex structures. His pet example, and one Dembski loves, was the bacterial flagellum, which sports a dizzying number of proteins that have to be arrayed in just the right way. The importance of irreducibly complex structures is that they cannot be built by Darwinism. Darwinism demands that each step in the long walk to the present structure be functional. But that can't be: since all parts are required for function natural selection couldn't possibly have added them one at a time.

Irreducible complexity is therefore a reliable marker of intelligent design. This argument sold a lot of books and got tremendous media airplay. Though Behe griped that evolutionists hadn't faced up to particular biochemical machines, his chief claim was that Darwinism just couldn't get here from there. He asked "What type of biological system could not be formed by 'numerous, successive, slight modifications'?" and answered "a system that is irreducibly complex." He announced that "[i]rreducibly complex systems are nasty roadblocks for Darwinian evolution" and spoke of "unbridgeable chasms".

Intelligent design is a non religious, but theistic scientific theory

Dembski devotes some time at the close of his book to what ID as a practicing "science" might look like. This is one of the more interesting parts of the book. Dembski knows a fair amount about the history and philosophy of science and his observations here are on the whole worth hearing. It's also here that we learn Dembski's thoughts not on design, but the designer. Dembski considers two questions that reside in the No Man's Land between science and theology: Is the designer embodied or unembodied? And is design front-loaded in the universe (e.g., at the Big Bang and is now playing itself out) or periodically injected throughout cosmic history?

Are these two questions a root for a new era in design theory, scientifically regarded? The answer is in the theological and social movements and arguments which are now being questioned by many scientist mostly in U.S.A., where there are several trials on role, regarding possibility of teaching intelligent design alongside with evolutionism in public schools biology classes. Time will confirm the (i)relevance of this scientific attempts to demonstrate the existence of a designer. By then, it is enough evidence for religious people to claim God can be, at last, taken in consideration by science.

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