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## ДОКАЗИ ТОЧНИХ НАУК ЩОДО ІСНУВАННЯ РОЗУМНОГО ЗАДУМУ

*Анотація.* Визначається та обговорюється парадигма Розумного Задуму. Наводяться докази точного доопрацювання фундаментальних постійних величин та передумов стандартної моделі Великого Вибуху, яка підтримувала ідею виникнення планети, що створює умови для життя людини. Розумний Задум як вищу наукову парадигму, як обговорюється у цій статті, можливо найбільш вичерпно показати на прикладі молекулярної біології.

**Ключові слова:** Розумний Задум, теорія Великого Вибуху, молекулярна біологія.

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## ДОКАЗАТЕЛЬСТВА ТОЧНЫХ НАУК О СУЩЕСТВОВАНИИ РАЗУМНОГО ЗАМЫСЛА

*Аннотация.* Определяется и обсуждается парадигма Разумного Замысла. Приводятся главные доказательства точной доработки фундаментальных констант и изначальных обстоятельств стандартной модели Большого Взрыва, которая поддерживала идею возникновения планеты, что создает условия для жизни человека. Разумный Замысел как высшую научную парадигму, как описывается в этой статье, возможно, наиболее исчерпывающе показать на примере молекулярной биологии.

**Ключевые слова:** Разумный Замысел, теория Большого Взрыва, молекулярная биология.

*Richard Carhart*

## EVIDENCE FROM THE EXACT SCIENCES FOR INTELLIGENT DESIGN

*Annotation.* The intelligent design (ID) paradigm is defined and discussed. Representative evidence of precise fine tuning in fundamental constants and initial conditions for the standard model of the Big Bang, to produce a planet which can support human life is presented. ID as a superior scientific paradigm will probably be fully shown in molecular biology we argue.

**Key words:** Intelligent Design, "Big Bang" theory, molecular biology.

**What is the Intelligent Design Paradigm?** After over 25 years of discussion, the Intelligent Design Paradigm and its resulting scientific description are better defined, but it still faces strong opposition. The intelligent design paradigm in a field of science says that certain objects and systems required intelligent agency (agency = design *and* assembly), and could not result from only physical law, chance, and environmental constraints. They did not self-design and self-assemble, even though

they function according to known natural laws. In this article we use the term intelligent design to mean intelligent agency.

To establish that an object or system is intelligently designed it is necessary to observe the purposeful, preplanned function of it. Dr. William Dembski has named the existence of this preplanned purpose or function of a complex system “*specified complexity*.” He has proposed a 3-step logical process, also called “*the explanatory filter*” [5, p.36 ff.] to test whether an object or system is intelligently designed.

In Dembski’s filter to identify intelligently designed systems, one must (1) *rule out that natural laws require the form and function observed*, (2) *show extreme improbability*, and (3) *identify pre-specified purpose or function*.

**Brief Review of “The Standard Model”.** The Standard Model of the “Big Bang” for the origin of space, time, and matter as we observe it today is well accepted among cosmologists, astrophysicists, and physicists at this time. It is based on known laws of physics, including Einstein’s general theory of relativity. In this model the universe began in an incredibly dense, hot, and small region with a quark-gluon plasma as one of its first stages about 13.7 GYA. (1 GYA =  $10^9$  years ago.) A period of very rapid expansion (called “inflation”) was followed by a sudden transition to a much slower expansion, which continued to slow, but now is believed to be increasing in rate.

Early inhomogeneities in the universe’s expanding matter and radiation led to the formation of super clusters of galaxies, clusters within the super clusters, galaxies within the clusters, and stars within the galaxies. When nuclei and atoms condensed out of the hot expanding matter, mostly hydrogen, deuterium, and helium formed.

By now there have been multiple generations of stars formed in many galaxies. The main sequence of star development has been formulated, but the time for a star to gather material, ignite, live, and “die” in a nova or supernova explosion depends on its mass. The heavier elements that make up much of our inner solar system were formed in an earlier generation of the heavier stars, which have already finished their journey through the sequence.

When stars “die” they explode in a nova or supernova, which disperses the heavier elements up to iron they have produced. During the explosion the nuclei heavier than iron (like lead and uranium) including the radioactive nuclei are formed by energy-absorbing fusion and neutron capture. Without this “enrichment” of our galactic cloud of matter, there would be no Earth as we know it, with its supply of heavier elements to form our bodies. In particular, carbon, nitrogen, and oxygen are formed as stars burn, and must be dispersed and re-gathered into a planet like ours for human life to be possible. A molten iron core also proves to be important for a life-friendly planet.

As a new solar nebula gathers by gravity from the galactic material, a new star forms at the center burning hydrogen and helium again. When the star ignites by gravitational collapse and heating, the remaining materials go through fractional distillation as a function of distance from the star, with inner planets containing the elements necessary for carbon-based life in the form of condensed “dust” particles. The particles start to stick together and collect others by gravity to form planets. Earth formed from the solar nebula about 4.5 GYA.

Geologists believe they have an accurate description of the history of Earth as it developed over time into the planet of today, including once having a single continent and single ocean. The continent broke up into tectonic plates which separated into the continents of today. The heat release of radioactive decay in the Earth's interior is believed necessary for this continental drift, recycling of crustal material, and enough surface melting to allow iron to concentrate in Earth's core. The iron core is also necessary to form the self-generating dynamo that gives Earth its protective magnetic field.

**How sure is the “Standard Model?”** The standard model is based on a web of current observations and their interpretations that tend all to support one another. The total body of evidence and interpretation is very impressive. However, we are trying to infer past conditions and events from presently observed data. In all fields of science that seek to learn about past events, we try to find a unique set of past events that must produce the present data *assuming uniformity of the laws over time and space*. In the case of cosmology, for example, we assume that Einstein's equations of general relativity hold in far away regions of space and time where we have never tested them directly. The history of science records many surprises when we actually do experiments under new conditions. Many billions of miles away or many billions of years ago (if they existed) are certainly new conditions.

Also, one is not sure how much selection of evidence has occurred. In any field, scientists seek evidence that tends to support the accepted picture, and question evidence that disagrees. This fact should also make us cautious about the web of supportive evidence. However, clear evidence in disagreement with the reigning paradigm can finally cause a new paradigm to be sought and accepted, as the history of science shows. And it usually requires scientists who are unwilling to discard data that disagrees with the accepted picture.

Also, there are difficulties in assuming “dark matter” that has never been observed except for its apparent gravitational effects, and some problems with large galaxies that seem to be far away where one expects only small galaxies based on the standard model. In other words, there is actually some data that disagrees. For those who believe the Universe and Earth are less than 10,000 years old, there is a formidable scientific challenge, however, to deconstruct the Standard Model scientifically.

Even in geology, where the history of Earth is studied, features like the ice ages are being debated. Very recent models suggest that  $10^6$  years ago the Earth may have been mainly mud, not towering piles of ice. [1] A careful discussion of how a historical science differs from laboratory science and the possible uncertainties of a historical science has been given by Meyer [10, pp. 150-172], and in a related form by Carhart [4].

**Fine Tuning in the Standard Model as Evidence for ID.** Those who consider that this model may describe the actual history of the Universe find very strong evidence in it for intelligent agency in its design and causation. A number of excellent books have presented the fine tuning evidence at a level accessible to the average scientifically literate person. [e.g. 9, pp. 58-77; 7, pp. 293-312] Here, only a few typical results are mentioned. Modern research with this model shows that the

fundamental force constants of gravity ( $G$ ), weak nuclear ( $G_w$ ), electromagnetic ( $e$ ), and strong nuclear ( $g$ ) must be extremely close to their measured values to produce a universe and a planet that can support intelligent carbon-based life like humans. Similarly, the masses of the electron, the proton, and the neutron, and possible neutrino masses, also can only be varied slightly and still produce a human-friendly environment.

For example, if  $e/g$  differs by 1 part in  $10^{16}$ , you do not get stars and thus cannot convert the initial hydrogen and helium into heavier elements like carbon, nitrogen, and oxygen. If you increase it by 1 in  $10^{40}$ , only small stars will form. If you decrease it by 1 in  $10^{40}$ , only large stars will form. Both sizes must be produced to get a solar system and an Earth like ours that has the right materials and temperature for intelligent carbon-based life. The cosmological constant is now known to require fine tuning of 1 in  $10^{53}$  at the Planck time of  $10^{-43}$  seconds to produce even one life-friendly planet. [11, online]

The fine tuning argument from the exact sciences says that the probability of all of the necessary constants of physics, and all of the special circumstances that must hold in solar system astrophysics and Earth geology is extremely small. Often small probabilities for each constant and circumstance are multiplied to produce a very small chance that this particular Universe happened. There seems to be an “anthropic principle” operating that all constants and circumstances are just what they must be for intelligent carbon-based life to exist, so that in some sense the Universe was designed with humans in mind.

One way to conclude ID is first to argue, according to Dembski, that a Universe can exist with a large range of values for all of the fundamental constants and with a large variety of special circumstances. It is not necessary for our Universe to be exactly as it is, giving a “yes” answer to step 1.

The fractional range of the value each constant can have and still produce an environment suitable for intelligent life is considered the probability of the existing value. Then the probabilities for all of the constants are multiplied to produce an overall probability. All who apply the method this way conclude the probability of the constants being right for life are much less than the  $10^{-27}$  that Dembski sets as the limit for inference to design in step 2. Step 3 in the explanatory filter is to identify the pre-planned purpose of the Universe. That purpose is to allow our existence as intelligent carbon-based life. One concludes that the Universe is intelligently designed for us. This conclusion has been reached by those with no religious bias in favor of it, so remarkable are the multiplied coincidences!

**Evidences of Fine Tuning That Are Independent of the Age of the Earth.** A number of the anthropic coincidences (AC) do not depend on modeling the development of a Universe, galaxy, star, solar system, and an Earth of great age. For example the value of  $e$  determines possible chemistry, along with the value of the nuclear force constant  $g$ , and the value of the neutron-proton mass difference. Within narrow limits these must be as they are to have proper carbon-based chemistry for intelligent life.

The existence of Earth’s molten iron core due to radioactive heating and the resultant protective magnetic field is another AC. Our solar system is currently (and

for another  $10^6$  years will be) in a high vacuum in our galaxy relative to the normal particle density in “empty space.” Otherwise impacts with these particles as we travel through the interstellar region between spiral arms of the galaxy would modify Earth’s magnetic field, destroying its ability to deflect solar protons from reaching the surface. Life would be destroyed if the AC of being in this higher vacuum bubble did not occur. Gonzalez and Richards [7, pp. 143-168] give a large list of ACs related to our galactic environment. A careful sorting of their examples yields many that do not depend on the model of an old Earth.

### **Counter Arguments to the Fine Tuning Argument in the Exact Sciences.**

There are two basic counter arguments to the argument to ID of the Universe from fine tuning in the exact sciences. The first says that probability calculations have no meaning because the Universe is the only one we can know, not one of many possible trial universes. We are just very lucky to be here!

The second argument postulates an extremely large number of universes with all possible values of the physical constants and all possible options for development. So, of course, the Universe we as intelligent carbon-based life find ourselves in has very narrowly the right values and circumstances. This view grants many trial universes and accepts the probability argument, but solves the dilemma by multiplying a very small probability by a very large number of trials. Since we cannot observe these other universes, their use in this probability argument is suspect, because their existence is not falsifiable.

**Molecular Biology May Settle the Discussion Within a Few Years.** The most powerful evidence for intelligent agency comes from the structure of life on Earth, especially within the cell. Every week new discoveries are announced that show ever increasing complexity and sophistication in the “computer program” directing the vast chemical factory inside the cell. Bill Gates, owner of Microsoft, has already told us that just the DNA code is far more complicated and sophisticated than anything Microsoft has written. But, new levels of logical programming that regulate DNA expression are being studied now, called “epigenetic programming.” [2] At present, no mechanism to produce this level of complex information processing by chance variation and natural selection has been identified. The limits of single and simultaneous double nucleotide substitution have been proven, and are hopelessly inadequate for the task. The action of intelligent agency is strongly suggested.

In describing life, the ID paradigm has passed through the first two stages of the scientific development of a new paradigm. It has stated a new overarching concept that raises new objective questions and can guide investigation. And, secondly, it has begun to make predictions and contribute to the peer-reviewed scientific literature.

But to qualify as a new scientific paradigm, ID will need to develop quantitative measures of complex specified information (CSI), especially in molecular biology, and find quantitative theorems regulating this CSI. This has begun also in at least two recent key papers, [6, 8] where CSI is called “functional information” as distinguished from the older, simpler concept of Shannon information. A companion paper by this author for this conference discusses these points further. [3]

**Who/What is the Designer?** Usually scientists interested in the ID paradigm refuse to speculate about who or what the Designer is. But, since Dembski’s

explanatory filter rules out that natural causes require the form of the system or object, and demonstrates that its appearance by chance is extremely unlikely, the actual intelligent cause of it could come from beyond the web of natural cause and effect. Of course, science progresses, and the realm of natural causes can expand and probability estimates can change. But gaps in our ability to explain using natural causes and reasonable probabilities can grow with further study as well as shrink. The conclusion that an object or system has no natural non-intelligent cause must be somewhat tentative, unless precise theorems are proven that forbid the system to arise naturally. Examples of such theorems are energy conservation, or the necessary increase of the entropy of the universe in any process.

If a system or object passes through Dembski's filter and qualifies as intelligently designed, it is at least possible that it has been produced by a supernatural designer and builder. It is not unreasonable to assert, for example, that such a system was created by the Hebrew/Christian God. In the case of the extreme complexity of life or the size, mass, and energy of the Universe, the Designer appears to have several qualities usually attributed to God.

St. Paul in his letter to the Romans [Rom. 1:19-20] says that every human being can discern two qualities of the Creator from the observable world: His *eternal power* and *deity*. Of course, even if one can prove that the Universe is intelligently designed, it would not prove that the God of the Bible did it. But, it would leave this as a reasonable conclusion from a scientific perspective built from the ID paradigm.

**Conclusion.** The fine tuning arguments for the Universe from the exact sciences do seem to have strong persuasive power for many people, leading them to accept that it is designed, and that there must be a designer. However, the counter arguments also seem quite strong for many people. We can say that intelligent design is consistent with the fine tuning of the Universe and our Earth habitat and environment in space. It is rational to believe that the God of the Hebrew/Christian Bible is the Designer and Builder of our Universe, Earth, and life itself.

A subset of the fine tuning evidence can be used by those who believe that the Universe and Earth may only be about 10,000 years old or less. But the evidence from molecular biology in its study of life is probably the strongest ID evidence for those who believe the Earth is "young" compared to  $4.5 \times 10^9$  years.

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