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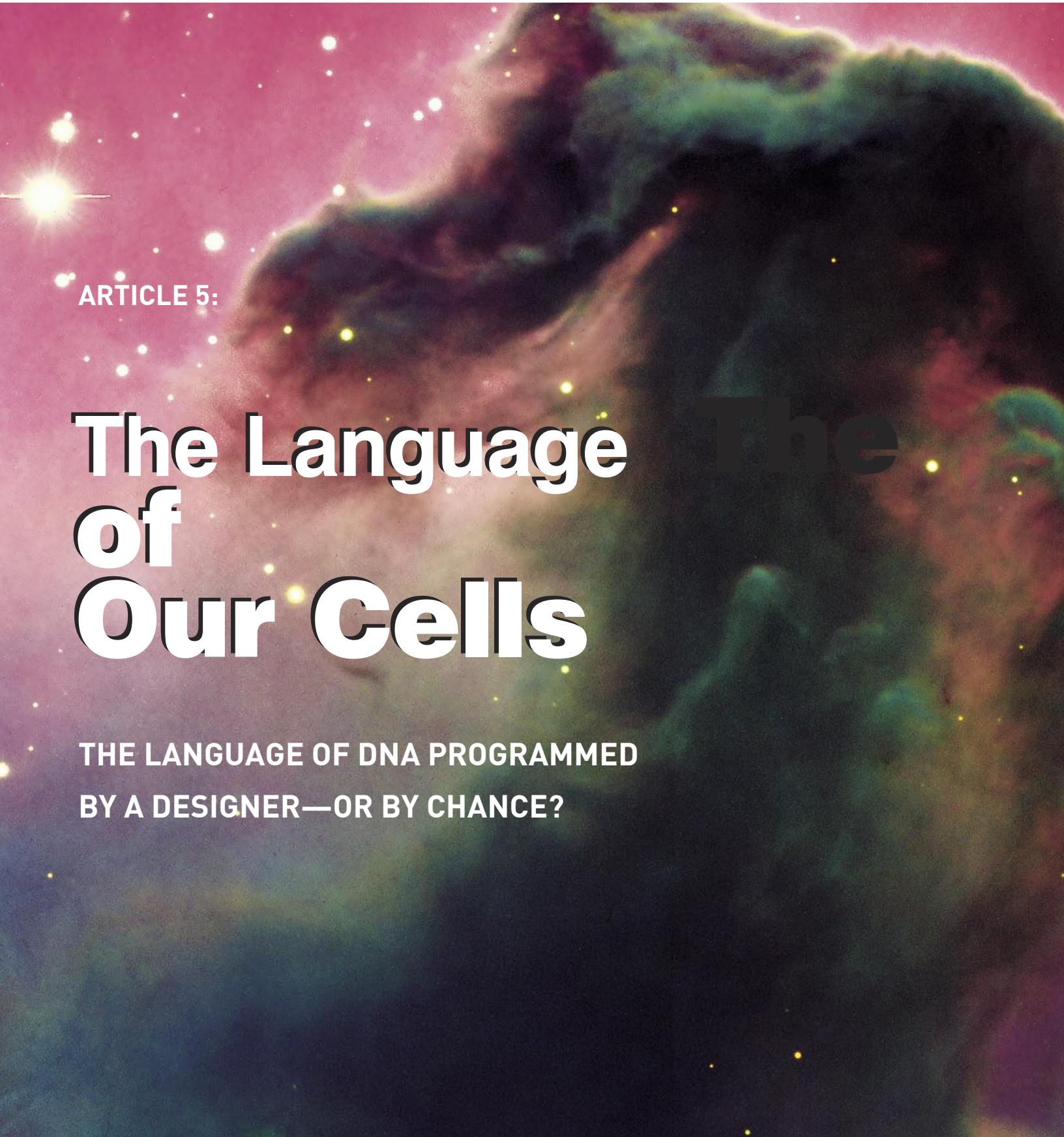

ARTICLE 5:

The Language of Our Cells

THE LANGUAGE OF DNA PROGRAMMED BY A DESIGNER—OR BY CHANCE?

The Language of Our Cells

Click on the e-article title for contents

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Larry Chapman

THE LANGUAGE OF OUR CELLS

WAS THE LANGUAGE OF DNA PROGRAMMED BY A DESIGNER—OR BY CHANCE?

OF CLOTHES DRYERS, MOUNT RUSHMORE, AND PRIME NUMBERS

Consider for a moment the cathedral-like structure of a snowflake under a microscope. Look at the beauty. Look at the complexity. Look at the originality of each individual flake. Surely this is evidence for a grand designer in the universe.

Well, no, actually it's not—no more so than the burned enchilada of a woman in Mexico that apparently revealed the image of Jesus (though in the photo it did kind of look like him).

Although crystalline forms of a snowflake are beautiful and impressive, designs of this type abound in nature, and natural processes can and do produce them.

Neo-Darwinists believe that natural selection and favorable mutations are the total explanation for the appearance of design in nature.

But what if complexity in nature is discovered that is not explainable by natural selection and chance mutations? What if, unlike our snowflake and enchilada examples, scientists discover a form of complexity that exceeds all human engineering and all sophisticated software programs? This raises an important question: How would we be able to detect intelligent design in nature if it actually exists?

The folks at SETI (Search for Extraterrestrial Intelligence) have done some thinking along the lines of what constitutes signs of intelligence. They are searching for extraterrestrial life, as opposed to God, but they have to deal with the same problem set. How would they recognize communication from outer space if they saw or heard it? Some of their thinking is brought out in the movie *Contact*. In one scene, the character

played by Jodie Foster spends the evening listening to her dryer (presumably Blockbuster was closed). But there is a method to her apparent madness. She is trying to train her ears so that she will be able to recognize intelligent radio signals from outer space, filtering out the zillion random signals produced by all manner of objects in the cosmos.

A clothes dryer produces a certain level of mechanical rhythm; its noise actually has a level of design, sort of like that of a snowflake. But that noise (especially when you have sneakers thumping around in there) represents a type of design that nonintelligence (that is, nature) can produce.

How can we tell the difference between design that occurs naturally and intelligent design?

Let's say we've headed out to Vegas, and along the way, we come upon a bizarre rock formation. I say, "Hey, look at the erosion on that rock. It looks kind of like Richard Nixon when the Watergate tapes were made public." You, on the other hand, think it looks like Vladimir Putin eating scrambled eggs. We agree to disagree, but we both note that the forces of erosion made something that looks a bit like a product of intelligent design.

Now, as we drive farther, we come to Mount Rushmore. Seeing it for the first time, I am amazed. I say, "Wow, look at the erosion on those rocks. It looks just like three presidents I recognize and some guy wearing glasses." You rightly call me an idiot, not only because you know who Teddy Roosevelt is, but also because it is obvious by the way the stone is cut and the extraordinary degree of design that this is the product of intelligent craftsmen—ones who apparently have no fear of heights. But there must be a more scientific way to differentiate between these two levels of design: one that can be produced by nature and one that can't.

Later on in the movie *Contact*, the scientists receive radio waves at the sequence of 1,126 beats and pauses. The sequence, they deduce, represents the prime numbers 2 through 101. It becomes doubtful that random radio waves could emit such a sequence, thus they presume they have made contact.

This is a more scientific way of differentiating between two different orders of design. It is commonly called *CSI*. This acronym has nothing to do with a popular TV show. It stands for "complex, specified information."

CSI: THE UNIVERSE

Here is what you need to remember about CSI, or complex, specified information. Nature can generate information that is complex, and it can produce information that is specified, but it cannot do both.

The best way to understand this is to think of yourself as a computer programmer. (You might want to grab a large bag of potato chips and a six-pack of Coke to get into character.) I want you to write a program for the computer telling it to type random letters of the alphabet.

It should be fairly easy to write the program. Just instruct the computer to type keys at random and repeat the process infinitely. Now, occasionally the letters might make an interesting pattern, perhaps even type the word "Nixon" by accident, but it is clearly generating a design of complexity without any real specificity.

Now let's switch it around. Let's say I ask you to program the computer to type the word "the". This is going to require specificity. You must specify, "Computer, type the letter 't,' then 'h,' and then 'e,' and do this over and over again until your printer runs out of ink or your hard drive crashes." This is specific, but it is not complex. You can program the computer in this case, like the previous one, with just a few lines of instructions.

Typing random letters or typing a simple word over and over is like the kind of design that natural processes can handle on their own.

Now let's look at specified complexity. Let's say I ask you to program the computer to write out a Harlequin romance novel and make the girl decide to dump the guy in the end. You would have to write a list of instructions for the computer larger than the book itself. You would have to specify, in the form of a command, every letter of every word.

Few people would have thought of Harlequin romances as specified complexity, but as you can see, they are. The commands to the computer are extremely complex and extremely specific. That's the kind of detail we must demand if we are going to believe that there is intelligent design exhibited in the world.

PROBABLY INTELLIGENT

Seems simple enough, but at what point does something cross the threshold from the simple design found in nature to second-order design produced only by intelligence? Mathematician William Dembski illustrates the difference by having us visualize a rat trying to go through a maze.

In a simple maze, the rat can take one turn and escape from the maze. Even a dim-witted rat could take one turn and escape. But now imagine that the maze is extremely complex, possessing walls and requiring 100 precise turns to reach the point of escape. How likely is it that the little critter will quickly learn all the correct turns and escape? Impossible–unless we have one awfully bright rat.

So, when do we infer intelligence? According to mathematicians when the odds against an event occurring are 1 in 10^{150} or greater, it *can't* be accidential.[1] In order to grasp such an astronomical number, consider that the odds against winning a Power ball lottery with a single ticket is about 1 in 10^{8}. Or trying to pick a solitary atom from all the atoms in the universe would be 1 in 10^{80}.

So, having cleared all that up, we come to the real question. Forgetting all the erosion and snowflake patterns, are there any examples of specified complexity found in nature pointing toward intelligent design? The short answer is yes. What follows, without getting into too much detail, is the longer answer. It uses the example of something each of us has heard something about: deoxyribonucleic acid, or DNA.

SO, HAVING CLEARED ALL THAT UP, WE COME TO THE REAL QUESTION. FORGETTING ALL THE EROSION AND SNOWFLAKE PATTERNS, ARE THERE ANY EXAMPLES OF SPECIFIED COMPLEXITY FOUND IN NATURE POINTING TOWARD INTELLIGENT DESIGN? THE SHORT ANSWER IS YES. WHAT FOLLOWS IS THE LONGER ANSWER. IT USES THE EXAMPLE OF SOMETHING EACH OF US HAS HEARD SOMETHING ABOUT: DNA.

WHAT A LITTLE STRAND CAN DO

DNA. That one complex molecule contains the complete blueprint for every cell in every living thing. In a sense DNA is like a recipe where common ingredients are used to make different dishes. Only, instead of tasty dishes, DNA instructs cells to make flowers, whales, chickens, or people. (Hmm…so chickens aren't tasty dishes?)

The genius of DNA lies not only in its complex coded instructions for life but also in its incredibly well-designed architecture, which allows it to contain billions of detailed instructions within a microscopic molecule. The amount of DNA that would fit on a pinhead contains information equivalent to that of a stack of paperback books that would encircle the earth 5,000 times![2]

Our complete blueprint is present in each of our thousand million million cells. Think of an enormous building with thousands upon thousands of rooms, where each room houses a complete set of blueprints for the entire structure. (If these analogies are getting a little sterile for you, then you might want to imagine a series of beach houses—and imagine yourself sitting in one.) However, instead of merely thousands of rooms, our bodies contain trillions of cells, each with a complete package of DNA instructions.[3]

Each strand of DNA in our bodies consists of three billion base pairs of genetic information. These base pairs form a chain, which constitutes the entire human genetic code. Today the entire human genome has been mapped out. Even though humans are closest to chimpanzees in DNA sequencing, there are still some 40 million differences. (Except maybe with my friend Bob.)[4]

YOUR CELLS ARE TALKING

But just what is DNA, and how does it work? Although scientists are only beginning to unravel its mysteries, they know that DNA works much like a coded language. Microsoft chairman Bill Gates (apparently sizing up the potential to patent it and make it a part of Windows) discloses, "DNA is like a computer program, but far, far more advanced than any software we've ever created."[5]

When we think of sophisticated computer programs, we immediately realize that their coded software was intentionally designed. Materialists believe that DNA originated without any such intentional process. But is it possible that natural causes alone engineered DNA?

Prior to microbiologists' discovery of the incredibly complex language of DNA, materialists had believed its origin was explainable by natural means. However, design theorists have now applied the mathematical discipline of CSI to the question of whether DNA is the result of intelligent design or was accidental in its origin.

Historian and philosopher Stephen C. Meyer comments on the intelligence required for coded languages: "Our experience with information-intensive systems (especially codes and languages) indicates that such systems always come from an intelligent source."[6]

In other words, like a code or language, DNA operates with specifically organized instructions. This is the CSI (complex, specified information) discussed earlier as the watermark of intelligent design.

When DNA directs the cell to make proteins, it first gives instructions to make amino acids. Then twenty different amino acids must precisely link up into a chain, folding into an exacting, irregular three-dimensional protein. The amino acids are like letters; their arrangement spells out the specific protein being made.

Proteins are truly amazing. MIT-trained scientist Dr. Gerald Schroeder explains,

> Other than sex and blood cells, every cell in your body is making approximately two thousand proteins every second. A protein is a combination of three hundred to over a thousand amino acids. An adult human body is made of approximately seventy-five trillion cells. Every second of every minute of every day, your body and every body is organizing on the order of 150 thousand thousand thousand thousand thousand thousand amino acids into carefully constructed chains of proteins. Every second; every minute; every day. The fabric from which we and all life are built is being continually rewoven at a most astoundingly rapid rate.[7]

LIFE IN A TEST TUBE?

In the 1950's, Harold Urey, a professor at the University of Chicago challenged his students to create life in a test tube. One of his students who tried, Stanley Miller was jubilant, when after enormous efforts he produced a few amino acids…the building blocks of proteins.

It all appeared so promising, but what Miller didn't understand then was that without DNA, those amino acids would never be able to form proteins…the stuff of life. The initial euphoria faded once further discoveries revealed life's incredible complexity.

Professor J.P. Moreland compares laboratory results with the complexity required to generate life: "…if life can be likened to an encyclopedia in complexity and information, the best we have done is to synthesize a compound which carries the complexity and information of the word ME. The jump from ME to an encyclopedia is so far and speculative that the relevance of progress so far is questionable."[8]

Meyer points out that the chemical codes directing the process attach themselves to the structure of the DNA molecule like letters on a chalkboard, but they do so without becoming organically involved with the board or the other letters. Therefore, he distinguishes the information content from the chemical bonding.

Furthermore, Meyer compares the sequencing of the amino acids to a language: "Amino acids alone do not make proteins, any more than letters alone make words, sentences or poetry."[9]

The fact that the arrangement of the letters is not the result of chemical bonding has driven Meyer to conclude that, without intelligence, DNA would never be able to turn amino acids into proteins. He writes, "The chance of each amino acid finding the correct bond is one in twenty; the chance of one hundred amino acids hooking up to successfully make a functional protein is one in 10^{30}."[10]

And to survive, the protein chain must be contained within an intricate cellular architecture. That means that the odds against a protein being manufactured randomly are astronomical. It would be easier for a blindfolded person to find one special grain of sand hidden on one of the world's beaches than to have a protein appear by chance.

WHERE DID IT COME FROM?

Such complexity is so improbable that Meyer believes the DNA code cannot be the product of undirected natural processes. Furthermore, he reasons that DNA coding exhibits creative intelligence beyond random chemical bonds.

Perhaps this is why every attempt to create life has failed. Cambridge Professor of Evolutionary Paleobiology, Simon Conway Morris remarks on biologists' efforts to replicate life in a test tube: "And yet, something is clearly missing: life cannot be created in the laboratory, nor is there any clear prospect of it happening."[11]

How did a molecule with such complex coded instructions originate? What natural process triggered a smattering of

organic chemicals to come together and form the incredibly sophisticated double helix? Schroeder remarks, "And here's that enigma. … It shows its head in a dozen different ways, the problem of how the entire process originally got started."[12]

Dembski, Meyer, and Schroeder are part of a growing number of scientists and mathematicians who have concluded that the DNA molecule is so complex that it couldn't have spontaneously assembled itself.

In *Probability 1*, mathematician and evolutionist Amir Aczel summarizes the DNA dilemma: "Having surveyed the discovery of the structure of DNA … and having seen how DNA stores and manipulates tremendous amounts of information (3 billion separate bits for a human being) and uses the information to control life, we are left with one big question: What created DNA?"[13]

An increasing number of scientists in other fields are also admitting that DNA's complexity is not explainable by mere chance. Theoretical physicist Paul Davies affirms in *The 5th Miracle*,

> The peculiarity of biological complexity makes genes seem almost like impossible objects. …
>
> I have come to the conclusion that no familiar law of nature could produce such a structure from incoherent chemicals with the inevitability that some scientists assert.[14]

Biologist Michael Behe comments on the dilemma facing scientists who are wedded to a purely materialistic account of the origin of life, "In the face of the enormous complexity that modern biochemistry has uncovered in the cell, the scientific community is paralyzed."[15]

Agnostic Sir Fred Hoyle, when considering the enormous information requirement of life writes, "Were a refined theory available for estimating the information content of DNA it would, in our opinion, be immediately apparent from its overwhelming content that life could never have arisen on a miniscule planet like on Earth. It would be seen that, to match the information content of even the simplest cell, nothing less than the resources of the entire Universe are needed."[16]

DNA BY DESIGN?

Scientists have been stunned by the overwhelming probability against DNA forming by chance. It is one thing for intelligent scientists to manipulate chemicals under laboratory conditions, and it is quite another to attribute the origin of DNA to random action. Even the most ardent materialists do not claim to have explained DNA's origin.

Amir Aczel questions his own materialistic belief by admitting that DNA is too complex to have arisen from natural processes. In a reflective mode he asks,

> Are we witnessing here something so wondrous, so fantastically complex, that it could not be chemistry or random interactions of elements, but something far beyond our understanding?[17]

DNA's codiscoverer Francis Crick also considers DNA to be too complex to have arisen in a warm pond on early Earth. This highly regarded Nobel Prize–winning biologist concludes, "An honest man, armed with all the knowledge available to us now, could only state that in some sense, the origin of life appears at the moment to almost be a miracle, so many are the conditions which would have had to have been satisfied to get it going."[18]

In spite of Crick's assertion that DNA appears miraculous he remained a materialist and began looking to outer space for the origin of life. (panspermia).

Having acknowledged the impossibility of DNA to originate naturally, some scientists have shifted their focus to RNA. Several biologists believe that DNA emerged from RNA. However, microbiologists who have analyzed RNA now believe it too "could not have emerged straight from the prehistoric muck."[19]

Not only is RNA prohibitively intricate, but it's far more delicate than DNA, meaning it couldn't cohere by itself even if it did come together by chance. Thus, the origin of life remains an unsolved riddle to scientists.

Aczel reasons that the complexity of DNA could not have arisen naturally on Earth, He asks, "Was it perhaps the power, thinking, and will of a supreme being that created this self-replicating basis of all life?"[20] Like Crick, Aczel concludes that DNA must have arrived from outer space.

But according to Dembski, "Natural causes such as chance and law are incapable of

producing CSI."[21] Since these laws apply throughout the universe, one shouldn't hold his breath about finding Klingons on Planet Qo'noS in the Beta Quadrant–unless a designer made DNA based life elsewhere.

So how did life on Earth originate? Is intelligent design worthy of consideration? Not according to Dawkins, Eldridge, Mayr, and a host of other materialistic scientists who are convinced it is an enemy of science. Yet other leading scientists are willing to objectively look at the evidence. And new scientific evidence has pushed intelligent design to the forefront of the debate on origins. Even many hardened atheists have considered the evidence and admit the implications of design.

Antony Flew is one materialist who led the charge against an intelligent designer. Recognized by many as the world's leading atheist for the past fifty years, Flew wrote over thirty books arguing against a creator.

But this formidable atheist took an honest look at DNA, remarking,

> What I think the DNA material has done is show that intelligence must have been involved in getting these extraordinarily diverse elements together. The enormous complexity by which the results were achieved look to me like the work of intelligence.[22]

Flew, who accepts Darwinian evolution, but doubts it can account for life's origins, sees intelligent design as the best option to explain biological complexity. He made front page news when he renounced his atheism, remarking,

> I think the argument to Intelligent Design is enormously stronger than it was when I first met it…It now seems to me that the finding of more than fifty years of DNA research have provided materials for a new and enormously powerful argument to design.[23]

Flew's honesty is to be applauded, but materialists aren't clapping. As the intelligent design movement gains momentum, many refuse to consider it as an option, dismissing it as "unscientific." However, most thinking people want to hear the facts and draw their own conclusions. Like Flew, many who have honestly investigated the evidence, are in awe at what appears to be a superintelligence behind life and all its intricate complexity.

"It now seems to me that the finding of more than fifty years of DNA research have provided materials for a new and enormously powerful argument to design."

Antony Flew
former leading atheist

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WHAT SETI IS LOOKING FOR

The scientists at SETI (Search for Extraterrestrial Intelligence) are searching for radio signals from outer space that contain complex, specified information (CSI), which would prove the transmissions were not random but the result of intelligent communication.They employ four criteria in examining radio signals.

1. Spikes. These are radio waves occurring at single frequencies that are strong enough to be distinguished from general noise.

2. Gaussians. Radio signals from a distant transmitter should get stronger and then weaker as the telescope's focal point moves across that area of the sky. Specifically, the power should increase and then decrease with a bell-shaped curve (a gaussian curve). Gaussian curve-fitting is an excellent test to determine if a radio wave was generated "out there" rather than being a simple source of interference somewhere here on Earth, since signals originating from Earth will typically show constant power patterns rather than curves.

3. Pulses. Our alien neighbors may not be sending out a nice, even tone for us to detect. They may be sending a series of spaced pulses—a more economical use of power.

4. Triplets. A triplet is a set of three equally spaced spikes. The SETI@home screensaver tests for triplets by looking at every pair of spikes above a certain threshold power. It then looks for another spike precisely between the two spikes. If one is found, a triplet is logged and sent back for further study.

"Are we witnessing here something so wonderous, so fantastically complex, that it could not be chemistry or random interactions of elements, but something far beyond our understanding?"

Professor Amir Aczel