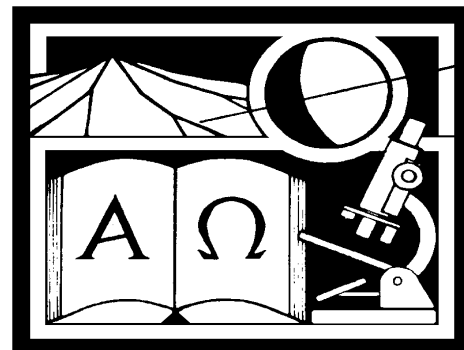


# Origins Insights

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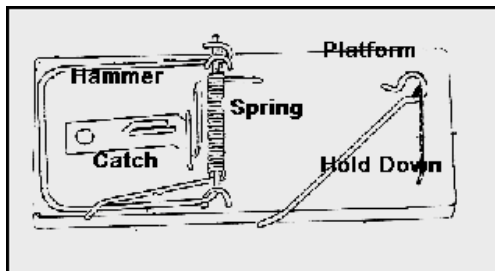
July/August 2002

## The Irreducible Complexity of Simple Organisms with Complex Parts

by Bob Harsh

In 1998 Michael Behe wrote a book *Darwin's Black Box*. That book has stirred a lot of debate. One of the strong points of Behe's book is the concept of irreducible complexity. I believe evidence of irreducibly complex systems in nature is extremely harmful to neo-Darwin theory. Intelligent design has served as an effective alternative theory for the origin of living things. Irreducible complexity has served as a roadblock to materialistic origin of life.

What exactly is an irreducibly complex system? If a structure is so complex that all of its parts must initially be present in a suitably functioning manner, it is said to be irreducibly complex. A simple mousetrap is irreducibly complex. Nothing can be missing and it could not have been invented one piece at a time until it could catch mice. How many parts does an irreducibly complex mousetrap have? Six components: the platform, the spring, the hammer, the catch, the holdback bar, and staples.



Let's remind ourselves about the concept of "intelligent design". We see evidence of design everywhere in nature. The most simple man-made devices proclaim, "I was designed to do my task on purpose. I did not just magically appear!" How do we distinguish between an object that was designed from one that happened by blind purposeless forces of nature?

### Information Content

Adding the same type of molecule over and over again until a crystal is formed produces repetitive structures like crystals. This would be like discovering a secret code that consisted of the same four letters repeated ten thousand times.

ABCDABCDABCDABCDABCDABC

### MEETING INFORMATION

**TOPIC:** AiG Video—Is Genesis Relevant Today? (30 minute video)

**PRESENTER:** Jim Hawk

Do you have questions about why and how the Bible explains Creation in 6 literal days almost 6,000 years ago? Does it matter whether Genesis relates the true history of the universe, or is it merely a fairy-tale for grown-ups? What has happened to once-Christian nations? What are some theological reasons the Earth cannot be millions of years old?

**Problem:** Genesis is being undermined by evolutionary humanism, thus the fabric of Christianity in many cultures is collapsing (Psalm 11:3)

**Solution:** Uphold the Bible's authority from the very first verse, and tear down the strongholds of evolutionary/'millions of years' thought patterns (Isaiah 58:12).

If you have access to the internet, you can download the study guide ahead of time at <http://www.answersingenesis.org>. Click on the link in the lower right labeled "Study Guides", and then the section in the lower right labeled "The Answers with Ken Ham Seminar series" will have a link.

**DATE:** Tuesday, July 16, 2002

**TIME:** 7:30 PM

**PLACE:** Mars Alliance Church, 997 Route 228, Mars, PA, 16046  
Church Phone: (724)776-9400

(Continued from page 1)

That code **contains no information** and trying to **decode it** to gain information would be **futile**. The opening paragraph to a story contains information and we correctly deduce that **someone put thought into the combinations of letters they used to convey their message**.

## Information is Evidence of an Author

Information content characterizes all living things. Information content is also evidence of intelligent design. On the other hand, evolutionary theory disallows any hint of an intelligent author for the "apparent design" we can clearly observe in the structures and biochemistry in living organisms.

Darwinian evolution requires a gradual step-by-step process in the development of living organisms. The validity of Darwinian evolution is refuted by irreducibly complex structures in living organisms. After all, if a structure is so complex that all of its parts must initially be present in a suitably functioning manner, it is said to be irreducibly complex.

Let's review why any structure or enzyme exists.

Where did you come from?

Egg + Sperm ? Zygote [Fertilized Egg] ? 2 cells ? 4 cells ? Embryo ? Fetus ? Baby ? Adult

*How did you know how to make:*

Your 2nd cell?

Your left ear and right arm?

Both ears right side up & facing forward

Why didn't you grow a tail?

You don't know how! = no genes for tail.

Why can't you glow in the dark like a firefly?

**You don't have the genes to produce either the structures or the enzymes to glow in the dark!**

**If you had the genes to glow in the dark, could you glow?**

**Absolutely! [If the genes were dominant or you were homozygous if it were recessive]**

**Why are you like you are? Chro-**

*mosomes / Genes / DNA*

The sequences of the nucleotides that make up your DNA are the most important factor in determining your **physical and biochemical** characteristics.

Question: Is there anything I can do to **willfully** change my DNA?  
**NO!**

Can DNA change?

**Absolutely. Changes in DNA are called mutations.**

How important are mutations to Evolutionary Naturalism?

*Total Importance!*

*Mutations are the total source for any NEW structures or proteins!*

*Are mutations real? YES*

*Have biologists ever observed a new structure or protein spontaneously appear:*

1 -that never existed before?

2 -that was not merely a deletion or altering of already existing structure or protein?

3 -that was **beneficial** to the species **in nature?**

**Never!**

Ribonuclease is an enzyme 124 amino acids long and performs functions that are essential and unique.

How does your body know how to make ribonuclease?

Your DNA has the information in 372 base pairs.

This gene contains 97% introns.

**How do you know how to make the oxygen transporting protein, hemoglobin?**

You have **exactly** the proper DNA.

**What are the odds of producing hemoglobin by pure chance?** Hemoglobin is a protein molecule that transports oxygen in blood. Each molecule is constructed with a proper sequence of 574 amino acids and arranged into 4 chains.

The sequence of amino acids is crucial!  
**One amino acid substitution, valine for glutamic acid produces a fatal disease!**

**What are the odds, by pure chance, of any given amino acid being first?**  
**1/20**

**[Humans use only 20 different amino acids to construct proteins.]**

**What are the odds for the second amino acid?** **1/20**

**The third?** **1/20**

**What are the odds of any three amino acids appearing in a certain sequence by pure chance?** **1/20 x 1/20 x 1/20**

What are the odds of the 574 amino acid sequence of the protein hemoglobin appearing in proper order by pure chance? **1/20 to the 574th power!** = **1/10 to the 747th**

**One followed by 747 zeros!**

But, does the sequence have to be **exactly** right? Ask a person with sickle cell disease! Substitute valine for glutamic acid = Sickle Cell Anemia

**A Fatal Disease!**

**What is evolution's explanation of obvious design?** In his book, ***The Blind Watchmaker***, **Richard Dawkins** wrote, **"Cumulative selection, by slow and gradual degrees, is the explanation, the only workable explanation that has ever been proposed for the existence of life's complex design."**

No one doubts that it takes intelligence to produce a complex machine. An automobile was not designed by undirected random thoughts and efforts. Why are some people so opposed to the same rational conclusion about the extreme complexity we commonly observe in living organisms?

Natural selection, like any other scientific idea requires testing. Evidence is required. You will find no confirmation in the scientific literature that "natural selection" is a process that leads to the production of an irreducibly complex system in any living organism.

In the rest of this article, we are going to examine the flagellum of bacteria which proclaims:

## Designed by a Designer!!!!!!!!!!

Some bacteria move by means of flagella that resemble tiny electric motors. These flagella can rotate at a rate of 1000 times per second!

**E. coli :**

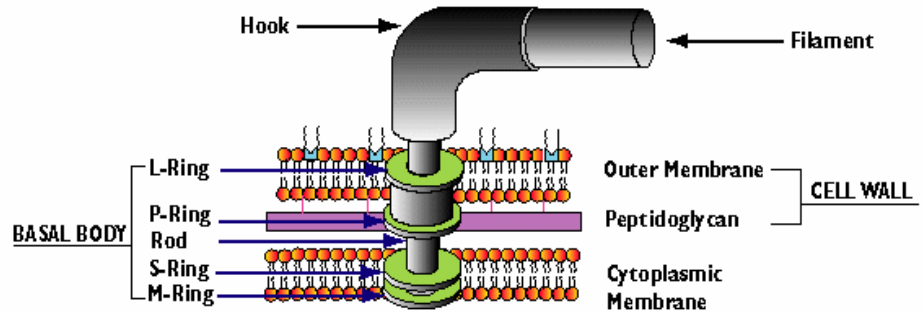
is about 1/1000th of a mm in size  
can swim 35 times its diameter per second  
can taste its environment  
can decide whether it wants to move in a way that increases its chances of getting something it needs or moving away from something harmful.

(Continued on page 3)

(Continued from page 2)

is equipped with rotary motors that are about 45 nm in diameter  
 has 4,288 genes encoded in 4,639,221 base pairs  
 can reproduce every 20 minutes

## FLAGELLA STRUCTURE IN GRAM NEGATIVE ORGANISM



### Parts of Bacterial Flagellum

- Filament** - Helical 20 nm x 10,000 nm  
 - Made of 20,000 monomer units of the protein - flagellin  
 - Rotates at base
- Hook** - Bent, attaches filament to base  
 - May help change direction
- Base** - Attachment of flagellum to cell wall  
 - L-ring in lip polysaccharide  
 - P-ring in peptidoglycan Attached to plasma membrane  
 - S-ring and M-ring

The proteins that make up the flagellum are present in multiple copies. For example, there are about 5000 molecules of FliC (also called flagellin) per helical turn of the filament, which can have as many as six turns. The MS, P, and L

rings each contain about 26 copies of FliF, FlgI, and FlgH, respectively. There appear to be eight stator elements (complexes of MotA and MotB), each of which exerts a similar force.

Howard C. Berg. Behavior of Bacteria. Physics Today

The structural complexity and finely tuned coordination of the bacterial flagellum attests to the work of a master engineer who designed and created the flagellum to function in a wonderfully intricate manner. **To function completely, the flagellum requires over 40 different proteins.** The electrical power for driving the motor is supplied by the voltage difference

developed across the cell membrane. *Fifty genes are needed to produce a properly functioning bacterial flagellum.*

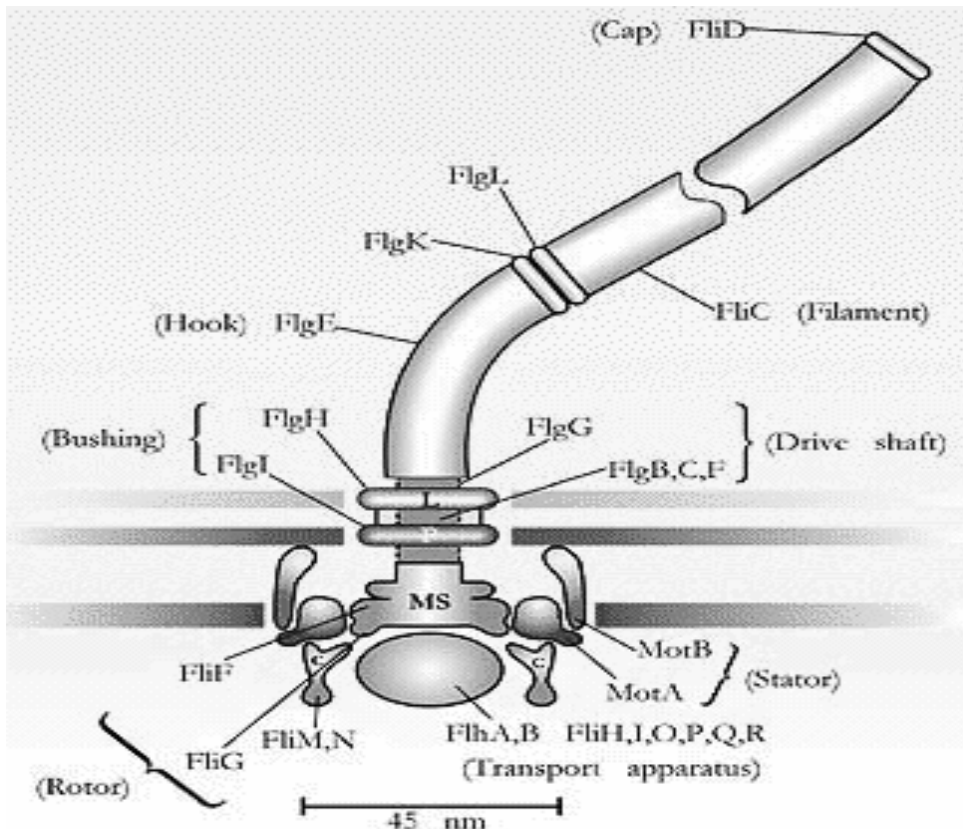
The genetically defined hierarchy of flagella operons in *Escherichia coli*. The master regulator FlhDC turns on class 2 genes, one of which, FliA, turns on class 3 genes. A checkpoint ensures that class 3 genes are not turned on until basal body-hook structures (BBH) are completed. This is implemented by FlgM, which binds and inhibits FliA. When BBH are completed, they export FlgM out of the cell, leaving FliA free to activate the class 3 operons. Note that flgM is transcribed from both a class 2 (flgAMN) and a class 3 (flgMN) promoter.

Kalir et al. 2001 Ordering Genes in a Flagella Pathway by Analysis of Expression Kinetics from Living Bacteria Science 292 (5524): 2080

*All the parts of a bacterial flagellum must have been present from the start in order to function at all.*

**Bacteria can change directions at "will".**

- 1- If the bacteria have a single flagellum at one end, they reverse rotation to change their direction.
- 2- If the bacteria have a single flagellum at each end:
  - One end propels one direction
  - Other end propels other direction
- 3- If a group of flagella surround



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the cell:

-They wrap around each other and rotate in unison

-To reverse directions they unwrap, move to other end, wrap around each other, rotate in unison

4- Other bacteria with multiple flagella surrounding cell:

-If they wrap around each other and rotate counter-clockwise in unison they swim in one direction.

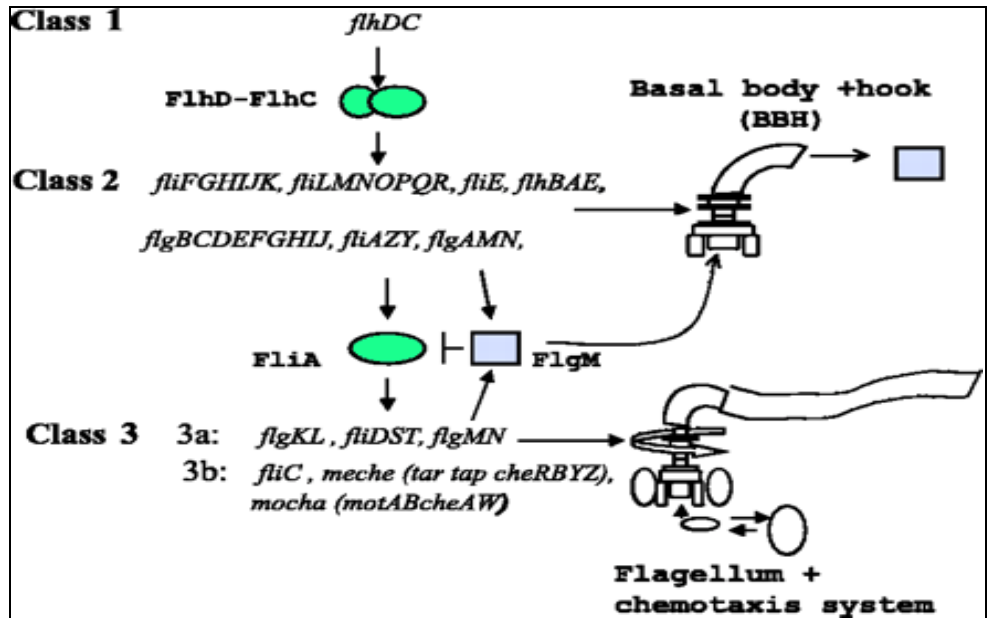
-If the flagella wrap in a clockwise rotation they fly apart and bacteria tumble chaotically.

These bacteria can sense their environment. If they experience increase in attractant or decrease in repellent they spend more time in counter-clockwise rotation, which can best be described as swimming. Counter-clockwise rotation therefore increases chances of going towards favorable conditions. On the other hand, decrease in attractant or increase in repellent promotes more time in clockwise rotation which brings about tumbling. This promotes increase in change of direction, which increases the chance of escaping unfavorable conditions.

**There must be a mechanism for first sensing the environment and then responding to the environment. The mechanism may be too detailed for your interest. But the point needs to be made to reinforce the truth that the “simplest” of all life forms are extremely complex.**

### Chemotaxis machinery.

This diagram shows some of the components required for chemotaxis toward the amino acid aspartate. Information flows from the outside of the cell (shown at the top) by way of porins, the periplasmic space, and the cytoplasmic membrane, to the inside of the cell (shown at the bottom), and then to the flagellar motors (not shown). Dashed arrows indicate physical displacement of chemicals by diffusion. Solid arrows indicate chemical modifications of proteins—phosphorylation or methylation.



lation.

Howard C. Berg. Behavior of Bacteria. Physics Today

What provides the energy to actually rotate the flagellum? The direct source of energy for almost all cellular activities is ATP. In the case of bacteria, a proton gradient across the cytoplasmic membrane of the bacteria is formed and the flow of electrons across the membrane, proton motive force (PMF), is what physically rotates the flagellum. The mechanism closely resembles the ATP synthase complex that eukaryotes use to produce ATP.

If Darwinian evolution is the source of bacterial design, the genetic information had to be added, not just changed. “Without any one of a number of parts, the flagellum does **not** merely **work less efficiently; it does not work at all.** Like a mousetrap **it is irreducibly**

**complex** and therefore **cannot have arisen gradually.**” [Lucy Shapiro, "The Bacterial Flagellum: From Genetic Network to Complex Architecture," Cell 80 (1995): 525-27.]

The only rational explanation of the origin of bacterial flagella is that they came about **complete** in the first bacteria that could move on its own. Bacterial flagella are sufficiently complex as to require “**intelligent design**” rather than chance events.

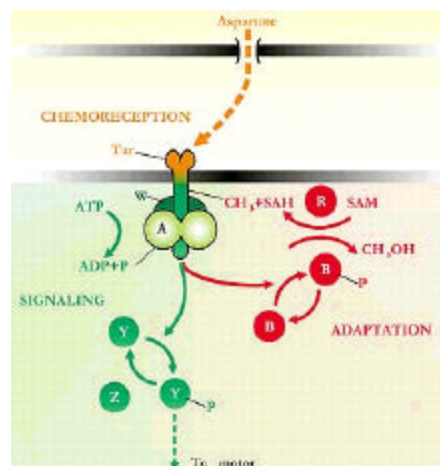
## Bacterial Flagella are Evidence for a Supernatural Creator!

Why would any educated person propose that evolution is a valid scientific explanation of the origin of bacterial flagella?

## EXtreme Faith in an Impossible Set of Natural Events

Apparent **design** indicates an **intelligent designer**. The rational explanation of the origin of bacterial flagella is that when God created life He

(Continued on page 5)



(Continued from page 4)

created bacteria with the complete genetic information for the construction of successful bacteria.

So, why is it important to learn any of this information? **Truth must defeat error.** Darwinian evolution influences the worldview of too many people. The false premises of Darwin's myth of origins have blinded millions of people.

## Evolution Doctrine

**Everything in the cosmos – from heavenly bodies to human beings – has developed and continues to develop through evolutionary processes. [Rene' Dubos]**

**In the evolutionary system of thought there is no longer need or room for the supernatural. The earth was not created: it evolved. So did the animals and plants that inhabit it, including our human selves, mind and soul, as well as brain and body. So did religion.**

[Julian Huxley ]

“All appearances to the contrary, the only watchmaker in nature is the blind forces of physics, albeit deployed in a very special way natural selection, the blind, unconscious, automatic process which Darwin discovered, and which we now know is the explanation for the existence and apparently purposeful form of all life, has no purpose in mind. It has no mind and no mind's eye. It does not plan for the future. It has no vision, no foresight, no sight at all.” [Richard Dawkins. 1986. *The Blind Watchmaker*]

## Dawkins in requesting blind faith!

If I find anything that appears to have been designed and manufactured, the rational conclusion is that there was a mind involved. It would be irrational for me to find a simple pocketknife and assume that the blind forces of physics and chemistry manufactured it.

## Tragic Fruits of Darwinism!

“Darwin allows one to be an intellectually fulfilled atheist. Before we had Darwin, the argument from design might have looked superficially like a good argument. You could have been an atheist, but you would have had to worry about how did it all come about. After Darwin, everything fell into place and one really felt a deep peace of mind, a deep satisfaction, a deep comfort with the idea that there was nothing else prior -- that all of this incredible diversity is all explainable in terms of gradual change.”

[Richard Dawkins as quoted by Kim A. McDonald. 1996. Oxford U. Professor Preaches Darwinian Evolution to Skeptics. *The Chronicle of Higher Education* November 29]

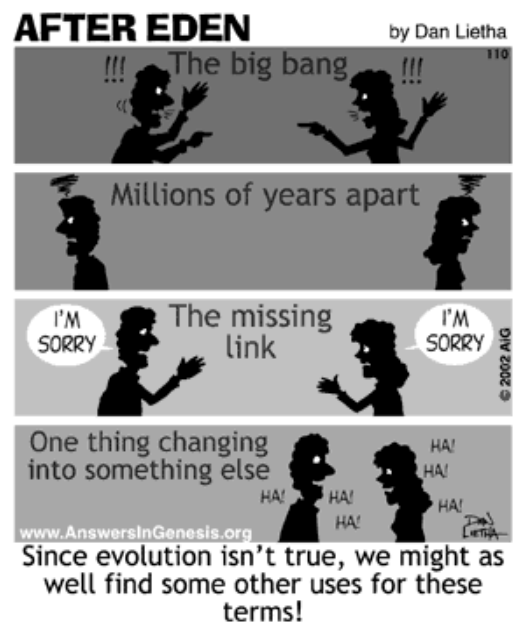
I believe Darwin's paradigm about the origin of living things *crippled*, not only his understanding of nature, but also, his understanding about God.

“For although they knew God, they neither glorified him as God nor gave thanks to him, but their thinking became futile and their foolish hearts were darkened. Although they claimed to be wise, they became fools. They exchanged the truth of God for a lie!” [ Paul. 1st Century A.D. Romans 1: 21,22,25]

*The biochemical complexity of bacterial flagella clearly requires that purposeful design has taken place. Purposeful design demands an intelligent designer.*

## PERSONAL NOTE FROM BOB HARSH:

*Due to the length of this newsletter there will be no OI in August. We will be meeting on August 20 for our regular CSF meeting, so mark your calendars. I am planning to travel again to Perm, Russia, on July 25 and present lectures on the “Icons of Evolution”. Please keep me in your prayers. Also pray for the people that I will be teaching. Pray especially for opportunities to share the good news about Jesus and that I will be an effective ambassador.*



*God is that designer!*



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**MEETING TOPICS  
FOR 2002**

**AUGUST 20, 2002**

How Shall We Then Live -  
Discussion of Chuck Colson  
Book - Reid Moon

**SEPTEMBER 17, 2002**

The State of Creationist Radio-  
metric Dating - Charles Danley

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**Email Address:**

**csficc@csfpittsburgh.org**

**CSF Page:** www.csfpittsburgh.org

**Editors Address:** Robert Harsh  
439 Little Creek Road, Harmony,  
Pennsylvania, USA 16037  
Email: naturbob@juno.com