Creation Science
Dialogue

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In this issue

Don't believe the hyperbole

It is easy to remind ourselves not to believe everything which is confidently declared as fact, but it is quite another to actually follow that good advice. How many generations of English students, for example, have memorized Shakespeare's ominous declaration in *Merchant of Venice*: "All that glitters is not gold--/ Often have you heard that told." (Act II Scene 7). Even today however, centuries after Shakespeare's time, we all too often believe appearances, whether they be objects for sale or statements of scientific fact. Just about everybody has heard, for example, that the geology of Mars bears ample testimony to that planet's watery past. Most people consider this a fact. Some recent articles on the topic however, demonstrate that this may not be the case.

The main evidence for the alleged watery past of Mars, is circumstantial. A recent commentary in the journal *Nature* for example pointed out: "That water once flowed on the surface of Mars seems clear from decades of awe-inspiring spacecraft images of valley networks and giant fluid-carved channels." (Dec. 22/29/05 p. 1087). Thus encouraged by appearances of past erosion, several nations co-sponsored orbiting space-craft to search, by means of remote sensing techniques, for signs of water-altered minerals. If there had been water at one time, such minerals should be present. For decades, such searches failed to find definitive traces of clays, carbonates or sulphates. For example, during the final stages of evaporation of large seas or lakes on earth, substantial carbonate salts are deposited on the sediments. If such an ocean once existed on Mars however, the drying up of this body left no carbonate signature.

Finally in the late 1990s, a machine on board the orbiting Mars Global Surveyer, identified small patches of the mineral haematite. Generally this mineral requires water to form. This discovery was thus taken as a good sign. But where were the clays? These minerals should be widespread. The Mars rovers were dispatched to find these and other evidences of the past presence of water. Finally a scientific team reported the scattered presence of phyllosilicates, clay minerals with a layered structure (*Nature*. December 1/05 p. 623) These clays were found in the cratered highlands of Mars and they were taken to indicate that Mars was wet at an early stage in its history. The scientists proposed that shallow highly acidic bodies of water existed between sand dunes, and that various episodes of higher and lower water levels led to the precipitating of haematite and other minerals.

Less than three weeks later however, two papers were printed (in *Nature*) which challenged the idea that water was present when these minerals formed. The paper by McCollom and Hynek (December 22/29/05 pp. 1129-31) proposed that these minerals formed at high

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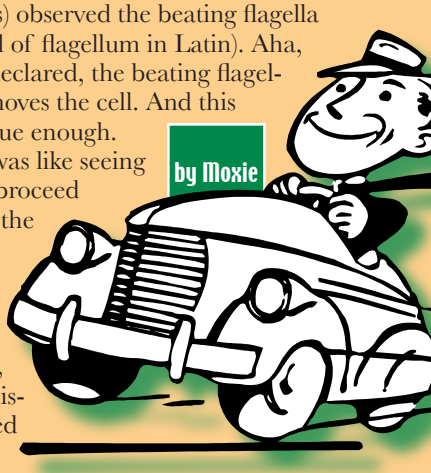
You be the Industrial Sleuth

Imagine that you had never seen a car or any automobile before. You might well be curious as to how the device is able to move. So you examine some vehicles in motion and you come to the obvious conclusion that the wheels are the agents of motion. This is all very obvious and all very true. However if you build a device with chassis and wheels only, you will not get very far. What a car requires is an engine manufactured in a factory and fuel to run the engine. Of course your car needs mechanics to maintain the engine too. It is immediately evident to you that the whole system is the result of designers who conceived of the whole idea and who specify how your car is to be manufactured and operated.

This reminds me of some tiny living cells which are able to propel themselves through a watery environment by means of a whip shaped thread called a flagellum. Many single celled algae move this way and even some which cluster in colonies. Also some single celled animals, and reproductive cells from some non-flowering green plants and from most animals. Many years ago scientists (using microscopes) observed the beating flagella (plural of flagellum in Latin). Aha, they declared, the beating flagellum moves the cell. And this was true enough. This was like seeing a car proceed down the street. Then in the late 1950s, they discovered that a flagellum consists of two very long tiny tubes (or tubules meaning tiny)



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Naturally Inspiring

Bird-watching is a joy, a career, or a hobby that could potentially take one round the world in search of species very different from familiar local specimens. Few bird-watchers however have professions which enable them to practice their hobby on any very extensive scale. Dr. John Stott is a well known minister based in London, England, who discovered, to his delight, that it was possible to watch birds even in the heart of the city. Later on, he was invited occasionally to travel overseas to lecture and to preach. Of course, he says, he took along his binoculars and camera. In this way, over the next forty or so years, he was able to observe about 2500 of the known 9000 bird species world wide. Now he has written a delightful account of some of his adventures and insights obtained from his observations. In addition to the text, the book includes more than 150 full colour photos taken by the author himself.

It is amazing how many birds the author discusses. Some of them are unfamiliar to most readers, while others are common. We read, among many others, about pelicans, puffins, penguins, storks, hummingbirds, egrets, robins, bald eagles, gannets, albatrosses and his particular favourite, the snowy owl. In every case the author has interesting observations on their occurrence and behaviour. Often these observations remind him of Bible passages and so the author discusses these too. For example, a discussion of the English house sparrow reminds Dr. Stott how God cares for each individual bird and He cares even more about each person. Bird songs remind Dr. Stott of people singing, particularly Christian hymns. In such fashion, the author includes discussion of faith, repentance, gratitude, work, freedom, love and protection.

This upbeat little book is perfect for those who love birds, enjoy nature or who appreciate a good commentary on the joys and requirements of the Christian life. Of course, it is all very well to observe and appreciate nature and as a consequence to act as good stewards of creation. It is quite another thing to accept in uncritical fashion, all the pronouncements of secular scientists. This is not a recommendation for a holus-bolus acceptance of modern biological theory, but a careful consideration of the details from nature in the light of Scripture. Ideal for personal, church and Christian school libraries. Great reading when one's spirits need a lift.

John Stott. 1999. *The Birds Our Teachers*. Candle Books, Oxford. Hardcover. 96 pages.

Role Models

Parents do their best to act as good role models for their children. Each new generation looks to previous generations for inspiration in what to believe, how to act, and what careers to follow. In addition, young people look for role models in their community. However not all role models are available locally. There are plenty of young people who find themselves endowed with

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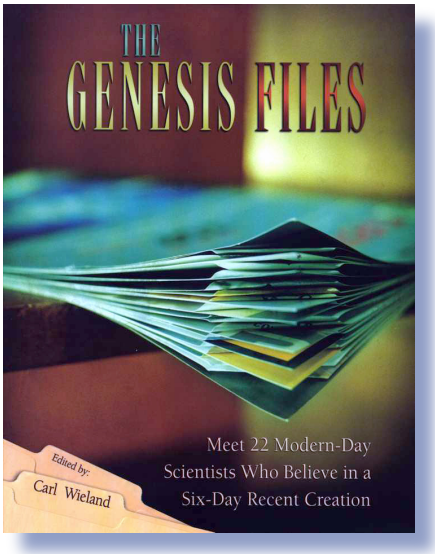
talents and interests unlike the people they know. In the field of science, for example, the local specialists and teachers may well all support evolutionary interpretations of nature. This may discourage many talented youngsters from pursuing a career in science.



As a result of this situation, Carl Wieland of Australia has edited a book which profiles the lives and careers of 22 scientists. Half specialize in the life sciences, mainly in medicine and some in agriculture. The other group includes a mixture of physicists and chemists with some specialists from a variety of other disciplines. Most of these people come from Australia or other Commonwealth countries, with a few from Asia and the United States. Some were raised in Christian homes, but many were not. Their stories are as diverse as their disciplines.

Some 'big name' scientists are included in the collection: for example American Raymond Damadian, inventor of the MRI, an incredibly important medical diagnostic tool, and Raymond Jones of Australia, who solved the problem of Australian cattle which were being poisoned by eating *Leucana*, a common legume on that continent. No scientist is more prominent in this group than American geophysicist John Baumgardner, who developed a computer model for plate tectonics. Dr. Baumgardner and colleagues found this model most useful in developing the idea of catastrophic plate tectonics, connected with the Flood. Other scientists of interest in the field of origins include astronomer Danny Faulkner and meteorologist Michael Oard, both from the United States.

No one can fail to be encouraged by the stories of scientists in this book. Many other individuals could have been profiled, of course. I personally would have liked to see more geologists, but maybe these will be the topic of a future book! At any rate, this book is interesting, inspiring and well illustrated. Every budding scientist will want a copy.

***The Genesis Files* - Carl Wieland (editor), paperback, $12.00**

Good Book

CLEARLY WRITTEN

The Fossil Book by Gary and Mary Parker is the newest addition to the *Wonders of Creation* series. Clearly written and beautifully presented with full colour photographs and diagrams, it is certainly as impressive as the other books in this series such as the *The Weather Book and The Astronomy Book*. Written for students grade 7 and up, *The Fossil Book* offers a wonderful starting place for a study of fossils as well as the Creation – Evolution debate.

The authors begin by explaining the contrasting views with which Biblical creationists and evolutionists approach the study of fossils. Through out the book these contrasting views are revisited to show that the view with which scientists approach the fossils affects the conclusions that the scientists reach about the fossils.

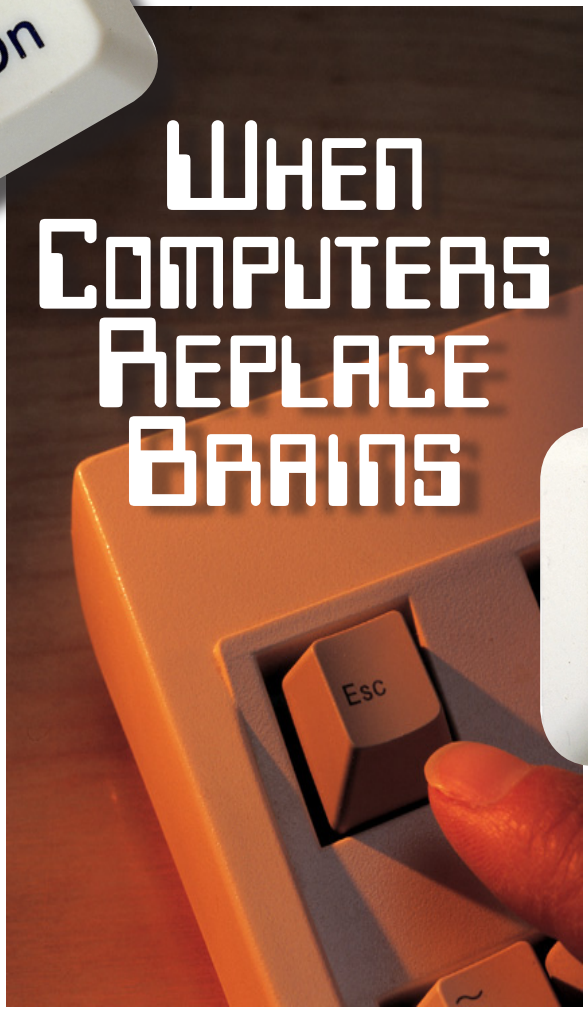
As students work their way through this book they will learn basics such as what a fossil is, conditions required for fossil formation and different types of fossils. Next they will learn about the geologic column; flood geology vs. evolution; and invertebrate (creatures with no backbone) and vertebrate (creatures with a backbone) fossils. After learning all about fossils, students may feel inspired to collect fossils of their own. To help with this Gary and Mary Parker have included an application section on "How to Build Your Own Fossil Collection".

Other aspects of this book that will prove to be helpful for further study or project work are a bibliography, glossary and index.

Consider adding *The Fossil Book* to your home library. You won't be disappointed! - ***The Fossil Book* - 80 pages, Hard- cover, Full colour, $15.00**

When Computers Replace Brains

by Margaret Helder



I really hate to admit it, but in certain situations I am old fashioned! In the good old days, biology students were taught about living organisms. We learned the appearance, life cycles and ecological preferences of various groups of plants, animals, fungi and microbes. Then the interest changed to themes. In graduate school, I took a course on fungi in which we learned about dispersal methods, environmental influences on reproduction, mechanisms of inheritance etc. We were given long lists of organisms exhibiting one characteristic or another, but if we were not familiar with any of these fungi, all we were left with was memorized names, and no understanding. Things are ever so much worse today when the trend is to study genomes (the chemical composition of the genetic material).

Everyone wants to know the DNA sequence or the order of coding in the DNA molecule for each organism of interest. Then we are told what the differences are between the sequences of species X and species Y. If you don't know what *Caenorhabditis* or *Arabidopsis* (or other organisms under consideration) are, you will not be impressed by differences in the order of DNA codes in their genetic material. The worry today is that many biologists will run a sample of DNA through a machine and thereby obtain a name. Will they know what the organism looks like or even how it acts? In many cases they won't.

It was evolutionary assumptions which led to interest in the specific order of information in each organism's genetic code. Most scientists assume that changes in the details of the genetic code will lead over time to major changes in the appearance and biology of an organism. Descendants which are more recently descended from a common ancestor, for example first cousins, should show more similarity in coding sequences than a population of third cousins once removed. In the same way scientists look for similarities and differences in coding between organisms which they assume have descended from a common ancestor. Thus there has been a major effort to document the exact sequences of the genetic material in well known organisms. The results have often been a surprise. That means the results have been contrary to evolutionary expectations.

Scientists would naturally expect that ordinary molds, such as one finds on rotting fruit and old bread, would exhibit quite uncomplicated patterns of DNA coding. A recent study of *Aspergillus* species is a case in point. You have seen such molds many times. These typically are dark coloured as a result of their spores. *Aspergillus nidulans* is a common nuisance for ordinary people but a popular object of study in the laboratory. *Aspergillus fumigatus* exploits such good things as vegetable compost heaps, but it also occasionally invades the lungs of individuals with compromised immunity. This naturally is a very serious situation. It also produces a variety of compounds to which many people are allergic. Lastly scientists recently studied *Aspergillus oryzae,* a microorganism used by oriental peoples for at least the past thousand years to make soy sauce (through the process of fermentation).

The results of the DNA coding exercise were not at all what one might have expected. It turns out that the commercially useful species *A. oryzae* has about the same number of genes as a fruit fly! In addition the genome of *A. oryzae* is 25% larger than either of the other two *Aspergillus* species. The commercial fungus turns out to have genes involved in the synthesis of numerous compounds not directly needed for normal growth, development or reproduction of the organism. It is these unusual products which make this organism so useful for improving the taste of foods.

Similarly another recent study looked at the genome sequence of the rice blast fungus *Magnaporthe grisea*, the most destructive agent of disease on rice. This fungus is very similar in

its appearance to another common mold called *Neurospora crassa* and not that different from the *Aspergillus* molds also. Anyway the interesting point of the study of the rice blast fungus is how different the details of its genetic information are compared to *Neurospora.* The scientists conclude their study with the remark that the rice blast DNA sequence is as different from that of the presumably closely related *Neurospora,* as the human genome is from that of a tropical toad (*Xenopus*)!! (*Nature* April 21/05 p. 985)

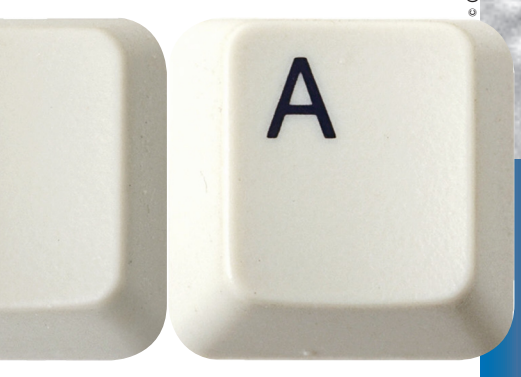
This unpredictable and unexpected degree of differences between some similar organisms notwithstanding, biologists have accumulated a lot of data which can be compared by computers provided with suitable software. When provided with a piece of DNA, modern laboratory machinery can produce a report on the order of the nucleotides (DNA code). Computers with suitable software can compare the nucleotide order and rank the DNA samples as the same as a standard or more or less different. It has occurred to many people that this is an objective way to compare specimens. Here we have hard data evaluated by a computer. Perhaps, some have suggested, we no longer need specialists who can study the appearance and biology of an organism in order to identify it. All we need is a piece of tissue from which DNA can be extracted. Insert the DNA into the machine and let the computer (comparing the order of nucleotides with standards for each species already in the database) then make the identification. No fuss, no muss! DNA barcoding is not here yet, but it is a coming phenomenon.

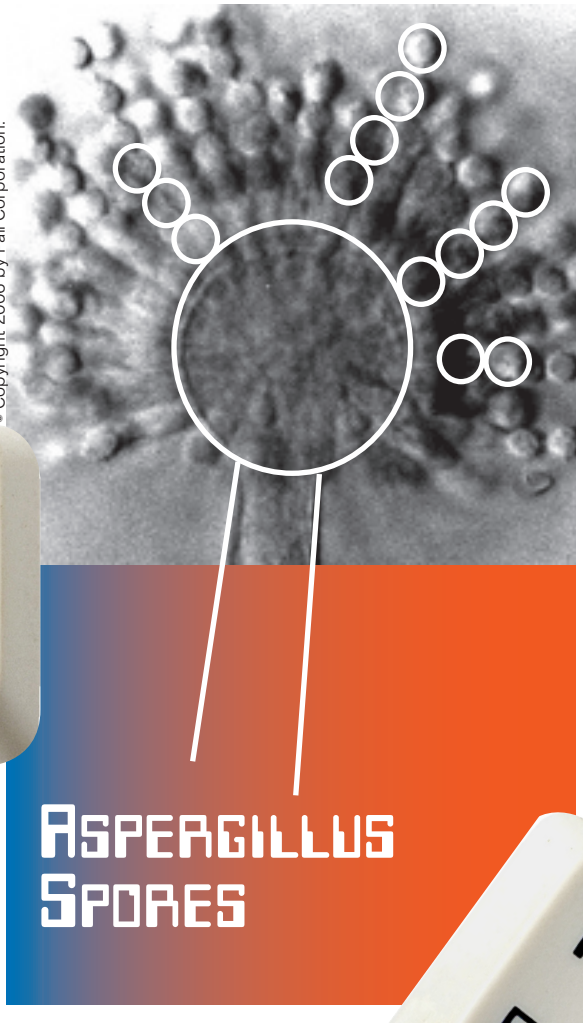
The Census of Marine Life (see Animal Travel Plans in Mar/06 *Dialogue*) has jumped on the DNA barcoding bandwagon. On a 21 day survey in April 2006, scientists trawled the sea at a depth of 5 km in an area near the "Bermuda Triangle". They catalogued 500 animal species including 12 new species. Now the scientists are barcoding or producing DNA sequences for the animals discovered. The hope is that in the future, a water sample containing organisms can be sequenced for its DNA content and the presence of various organisms discovered from a comparison of the results with DNA standards in the database. No scientist needs to squint at any of these organisms again, their presence would simple be recorded by the machine/computer combination.

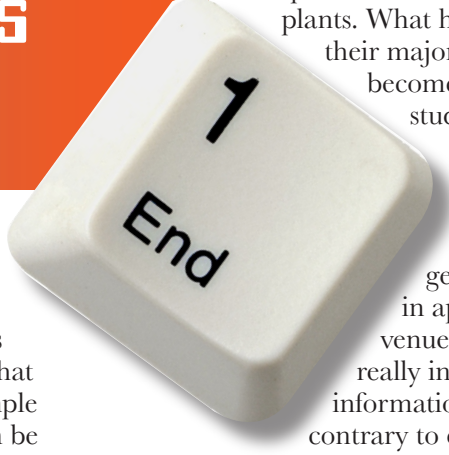
A consortium to promote DNA barcoding already exists. It consists of museums, herbaria, government organizations and private companies. Indeed a conference on the topic was held at the Natural History Museum in London in February 2005. The technique, it is hoped, will enable technologists to carry out the identifications rather than expensively trained scientists. Even botanical gardens are getting into the act. The New York Botanical Garden for example, is opening such a research centre in May/06 at a cost of $23.

The question arises, are we moving too far away from an understanding and appreciation of whole organisms? Would barcoding, even if the system were effectively set up, really provide us with anything other than dubious reports of positive or negative occurrences? Some specialists query the wisdom of the barcoding idea (given the expense of setting it up), but the idea seems to be gaining momentum. What we need rather than barcodes is appreciation and understanding of organisms and their ecology. The mandate of botanical gardens, for example, is to study and preserve beautiful and rare plants. What happens when their major interest becomes genome studies?

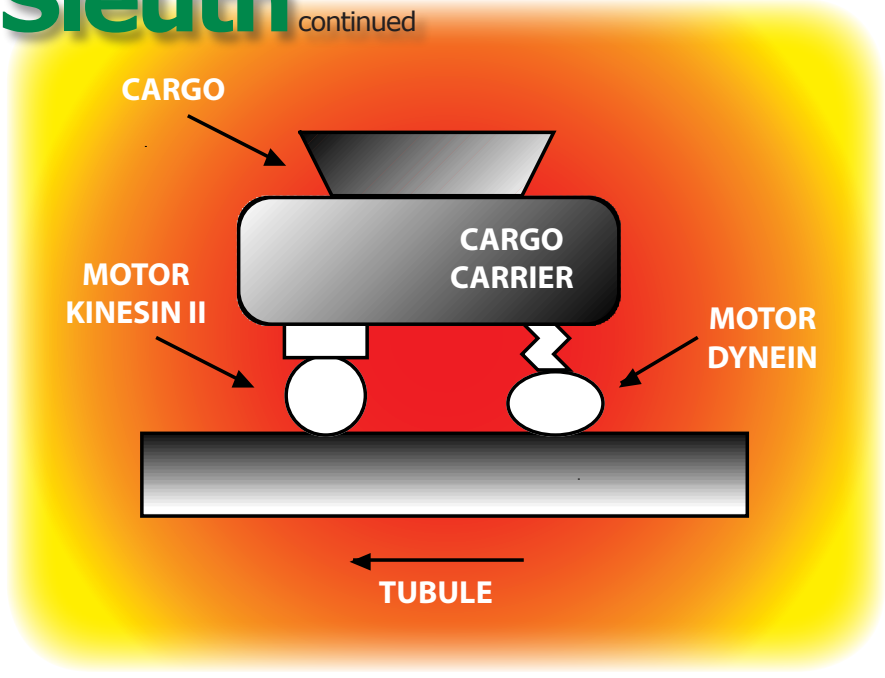
We do not advocate the abandoning of genome studies in appropriate venues. These reveal really interesting information (typically contrary to evolutionary expectations) as with the mold studies. But we do not want to see most of biology turned into a numbers/barcode game.







You be the Industrial Sleuth continued



Enclosed by a circle of nine pairs of equally long tiny tubules, enclosed by another concentric circle, a protective membrane. The scientists were now at the stage you would be when you spotted that the car has wheels. They still had no idea how the whole thing moves.

Further fancy work with microscopes and biochemical studies revealed that the tiny tubes or tubules in the flagellum are joined by spokes. Some of the spokes, while anchored to one tubule, move up a nearby tubule. This causes the whole structure to bend. Other spokes prevent the whole apparatus from losing its shape when bending occurs. Eureka you say, the changing of position of the tiny tubes causes flexing of the flagellum and swimming of the cell! You have now discovered that the wheels of the car move. You haven't really discovered why the wheels are able to turn. Similarly scientists at this stage knew very little about the how or why of swimming microscopic cells.

All that has changed within the past decade. Lo and behold, what scientists have discovered is a transport system which shuttles all the needed components out to a flagellum construction site. The platform for the whole device is already present in the cell. This is called the basal body. Construction begins there and progresses outward. All new components are laid down at the outer tip. The cargo to build the tubules etc is moved by carrier cars which are equipped on the lower side with two different motors and on the upper side with equipment for holding on to the cargo. During growth of the flagellum, the cargo carriers zip along the outside wall of the already formed tubules. Their speed, at 2-4 microns per second, is truly astounding. The diameter of the flagellum itself is only one quarter of a micron thick, but the flagellum may be several hundred microns long. While a micron is only a millionth of a metre, these distances are huge for the tiny machines involved.

The whole system operates very smoothly. At the tip of the newly forming flagellum, the carriers release the building materials. These carriers now proceed downward along a different track. Once at the bottom, away they go again. This system continuously operates in a living flagellum. Once the flagellum reaches its desired length, the cargo system serves to maintain it. In this case, quite a few empty cargo carriers zip outward, only to return with waste products. During the building phase, most cargo carriers are loaded moving outward and empty moving inward. When a flagellum is dismantled, most outward bound carriers are empty and most inbound ones are loaded.

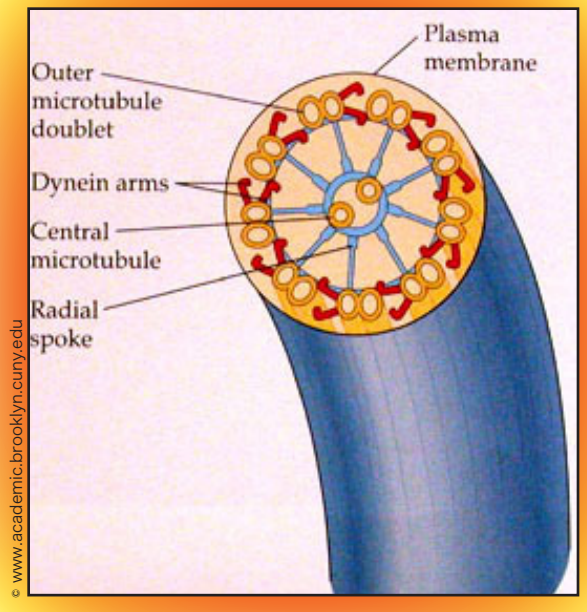
This system of machines seems sophisticated even at first glance, but a study of the molecular details demonstrates how intricate the system really is. The cargo carriers are made up of 17 different components called proteins. In addition there are two motor proteins on the lower side. During the outward journey a protein called kinesin II moves the cargo particle outward along the microtubule. If this motor protein is not present (possibly because of a mutation), then the cargo carriers do not move and no flagellum forms. For the inward journey, the particles switch on a new motor protein called dynein (present on the outward journey, but not functioning). The dynein moves the cargo carriers back to home base. Further studies have shown that other proteins are required to attach the motors to the carriers on the one side and also no doubt on the other side to link the cargo to the carriers, and to release it at the appropriate location. Once at the work site, the carriers which have just released their load, then become incapable of carrying cargo. This cargo-incapable status, (no doubt the result of a change in a protein), is important to ensure that the carriers do not mistakenly carry the building supplies back to home base!

A recent article on the astounding number of unique proteins in such a flagellum, drew my attention to this topic. The article was actually the cover story on the March 9, 2006 issue of *Nature*. Some scientists were studying a protozoan (single celled animal) called *Trypansoma*. This organism is notorious for causing a fatal

sleeping sickness in people in Africa. Hence we see the reason for the interest in this particular creature.

The point of interest to us is the large number of proteins found in the trypanosome flagellum but not found in the cell proper. There are 331 such proteins found in the flagellum alone. While some proteins, like tubulin (making up the tubules) and kinetin and dynein, have similar forms in other motile cells, the majority (208) of these proteins are not found in any other group of organisms. This unexpected finding caused scientists to compare the proteins in the trypanosome flagellum with those in two other well studied organisms. They found similar large numbers of unique proteins in the flagella of a green alga, and a protozoan related to the famous *Paramecium*, as well.

The vast load of unique proteins was a huge surprise to these scientists. They had expected that the apparent similarity in overall design (supposedly indicating an evolutionary relationship) would be reflected in similar proteins making up the flagella. This is the kind of discovery which is driving some scientists almost to despair. If the flagellum were indeed the product of evolutionary processes involving time and chance, then the molecular components such as these proteins, should be similar rather than wildly different.



Thus just as you, in your capacity as industrial sleuth, would no doubt conclude that a car needs a highly designed and well maintained motor in order to move, so scientists have discovered that each flagellum is a highly complex system requiring a blueprint, with an assembly and maintenance system which includes motorized proteins fueled by the cell's chemical energy supply. We may well guess that it is obvious to you, in your capacity as industrial sleuth, that a car nowhere develops spontaneously. Similarly, in your capacity as observer of complex systems whether large or small, will you attribute the origin of the flagellum to spontaneous processes operating over millions of years, or to wise design? It seems almost too crazy to even ask that question except that many influential people refuse to choose the obvious answer. They haven't looked at their own cars, have they?

Don't believe the hyperbole

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Temperatures from explosively released volcanic ash. No surface water was required, just some water vapour in the volcanic release. The other paper in the same issue (Knauth *et al* pp. 1123-1128), proposed that a ground-hugging turbulent flow resulted from the impact of a meteor. The outcome of such an event could very well resemble the land forms and minerals produced on earth through the action of water. It is evident that the presence of these minerals does not prove that water was ever present on Mars since other reasonable interpretations of their formation are possible. A commentator in this issue of *Nature* (p. 1088) concludes that it may well be that Mars never had the water needed to harbour life or origin-of-life processes. It is traces of life, after all, not just water, that the scientists really want to find on Mars.

An astute reader will notice that the journal *Nature* printed three papers within a month, all of which drew different conclusions. There is nothing wrong with this. It is good to examine an issue from different points of view. The problem comes when the media report one conclusion or other as fact. The lesson in all of this is, don't believe all the "everybody knows" pronouncements about Mars or any other issue. Find out the details. In the case of Mars, no one has yet demonstrated that large amounts of water were present on that planet. Maybe there was water there, or maybe there wasn't. We do not yet know and possibly may never know. Just don't get swept up in the rhetoric on this or any other issue.

The Genesis Files

Carl Wieland (editor)

Young people need role models if they are to aspire to excellence in a given profession. This book highlights the achievements and objectives of some Bible believing scientists. An inspiration to all. High school to adult.

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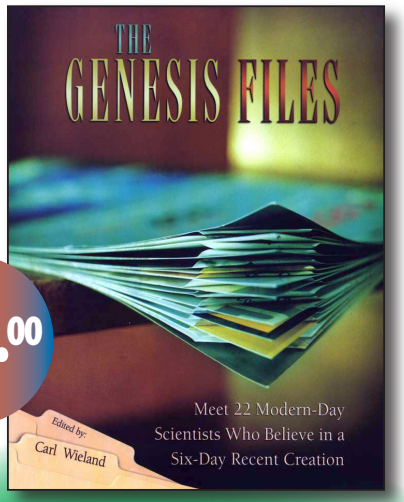

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The Fossil Book

Gary Parker

Written for junior high and loaded with colour illustrations, this book tells how and where fossils are found, how old they are, and how to interpret the geological column.

Hardcover 80 pages

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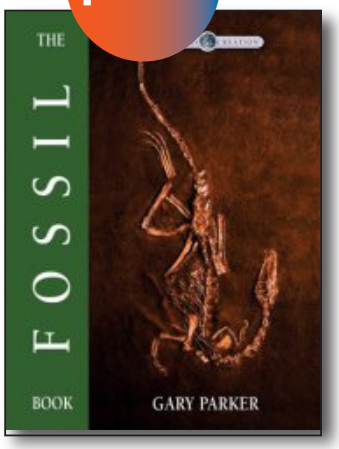

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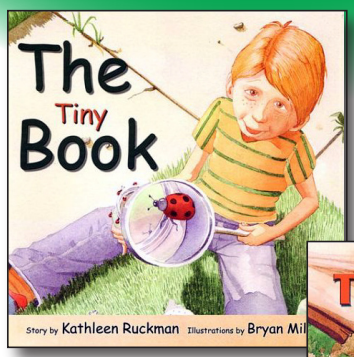

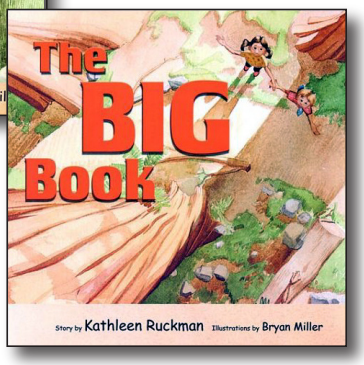

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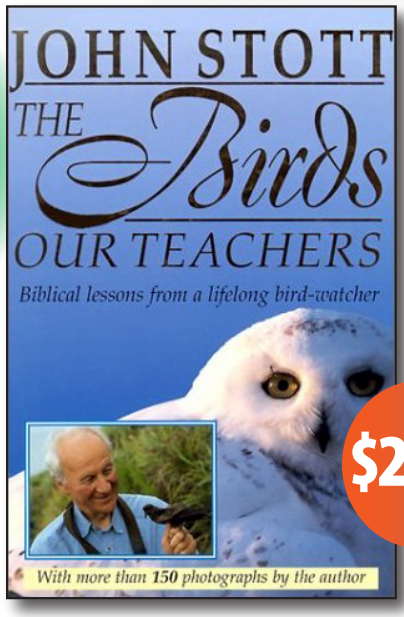

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