Creation Science
Dialogue
Volume 32 - Number 3 - October 2005
Publication Mail Reg. 40013654- ISSN 0229-253X

In this issue

Informative fun

Creation Family Camp 2005

by Lisa Derksen

On a beautiful sunny Sunday afternoon they converged on Salem Acres Bible Camp, a spectacular site which overlooks the Red Deer River. Whole families, from babes in arms to grandmas and grandpas came, all with cheerful smiles and eager minds.

Director Perry Petrushko warmly greeted all the campers and soon we felt at home. Unfortunately Perry was not able to stay with us for the remainder of the week, but he left his wife Melanie and Leo Gaumont in charge. However, Perry's fingerprint was evident throughout the week, and he was acknowledged for his excellent skills and vision.

Our first speaker was Dennis Trepanier who provided an introduction to issues of science and faith. Among the topics he touched upon was some modern evidence of quick fossilization, such as a 1950 era cowboy boot with the cowboy's fossilized leg still inside. Mr. Trepanier asked the question that if fossilization can occur in a short time now, why would we assume it took long ages before? In a similar context Ray Strom later referred to US Patent #4,612,050 for petrifying wood. The logs are petrified within a week, and are used to make fire retardant horse barns. Mr. Trepanier called short fossilization times the "Achilles heel of evolution."

Our next speaker, Dr. Margaret Helder spoke on the global flood. Besides Scripture, she discussed geological evidence. She looked at a rock formation which covers a seven state area including Zion National Park in Utah. The cross-bedding so evident in the rocks there, could only have been deposited in very deep water flowing at incredible speeds. Sand from this formation has been traced back to the east coast from Nova Scotia to the Carolinas. The famous chalk beds in England and France were of special interest to her. The Seven Sisters chalk beds are of writing quality chalk. There is no sediment mixed in, and the flat layers of

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Imagine That

by Moxie

Have you ever discovered that something you thought quite ordinary (or even ugly), was actually a priceless antique? I remember harbouring such sentiments when I was a teenager. Since then, of course, I have learned better how to identify valuable items. In a different context however, recently I discovered that a common wildflower of the boreal forest floor, a plant which we see everywhere in woodlands in spring, is actually an exceptionally remarkable biological specimen. I can't wait for next spring to come so that I can look at bunchberry more closely.

The bunchberry plant is native to the North American boreal forest everywhere from Greenland to Newfoundland to Alaska. Each plant has a short stem, 7.5-15 cm (3-6 inches) tall, topped by a whorl of 4-7 shiny evergreen leaves. The flowers occur in a cluster above the point where the leaves are attached. However the blossoms are not exactly conspicuous. Greenish or white in colour, each flower is about 2 mm long. No wonder few people notice such flowers. There is however something that people do notice. In the same way that tiny yellow Poinsettia flowers are surrounded by showy red bracts, so also the bunchberry flowers are surrounded by four showy white bracts. The bunchberry "flower" that most people identify, is

© Charles Peirce

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the deposit show no evidence of erosion between the layers. These were huge blooms of algae, deceased algae. Apparently algae are very sensitive to chemical changes such as salinity or to temperature fluctuations. Her tour continued to the Grand Canyon and Australia where bedding planes are also very level with no evidence of erosion between depositions. She also looked at bone beds along the Colville River in Alaska and Pipestone Creek in Alberta where dinosaurs were smashed together and drowned by fast moving water.

Ray Strom spoke on flood geology. Firstly we viewed a video on stratification from the University of Colorado featuring Guy Berthault and Julien Pierre. This shows that the top layer of sediment may be older than the bottom layer depending on deposition along a slope. Ray also showed us that the dry falls in Washington state are the result of catastrophic processes. He discussed specifically two Alberta sites at Hand Hills and Cypress Hills which are 240 km apart. Both are capped with gravel from Idaho. The beds are forty metres thick with all the rocks oriented in a SW to NE direction which is evidence of a huge sheet flow. Moreover Ray showed us rocks bearing percussion marks. Using the Kelstrom diagram, he calculated that such rocks would need to be smashed together by water flowing at 70 mph or 110 kph with a depth of over 300 m in order to produce such marks. That is a turbulent flow! These rocks can be found abundantly from Oregon to northern Alberta.

President of the Creation Science Association of British Columbia, George Pearce spoke about the privilege he had recently of traveling to the Galapagos Islands. He saw a variety of flora and fauna flourishing there even although there is no fresh water on the islands. As for the finches, they still have a variety of beaks, and they are interbreeding. None has evolved into a non-finch yet.

The children went to sessions with Vance and Korelie Nelson. Their topics ranged from creation to dinosaurs. The children had the opportunity to create all kinds of crafts. For example, they made dinosaur dioramas and painted casts of trilobites and *Tyrannosaurus rex* teeth. The enthusiastic participation of these youngsters was an inspiration to us all.

The whole group went on a field trip to the Royal Tyrrell Museum in Drumheller. Heavy rain meant that the schedule had to be juggled and Tuesday became Wednesday and Wednesday became Thursday. This meant extra work for the directors. In the end, because of high water levels in the Red Deer River, a planned trip down the river became instead a visit to the Tolman river flats where various people found fossil fragments.

One of the highlights was a panel session where inquisitive minds were invited and applauded. Topics included the kame and kettle topography in the Salem Acres area, creation of oil and gas, the porosity and permeability of rocks, mixing of fresh and salt water, nautiloid (like squid but with shells) fossils in the Grand Canyon and the ice age. We were encouraged to continue to research and ask questions, but always with respect, humility and sincerity. All in all, from wonderful food to wonderful fellowship, campers of all ages had a great time.

Creation Science Dialogue

Volume 32 / # 3 / Fall 2005

Creation Science Dialogue is a quarterly publication of the Creation Science Association of Alberta (CSAA). Its purpose is to discuss the creation model of origin in terms of scientific details.
Subscription for 1 year $5.00

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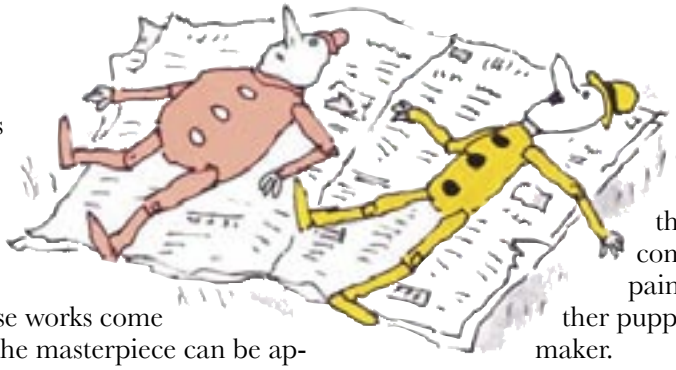
Review by Margaret Helder

Subtle Persuasion



Sometimes one encounters a work of art, a poem, piece of music, figurine or painting which is so simple yet so perfect. Simplicity, you see, takes more talent, not less, to bring about. Sometimes these works come from unlikely sources too. Yet the masterpiece can be appreciated for what it is, rather than for who the artist is. Most people would not consider children's literature to represent works of art, but of course there are exceptions, for example a story called *Yellow and Pink* by William Steig. This story is so simple, the illustrations so charming, the whole so pregnant with meaning, that it merits the attention not only of children but also of their discriminating elders.

The story involves two recently assembled wooden puppets laid out in the yard to allow their paint to dry. Suddenly aware of themselves and of their surroundings, they begin to speculate on where they came from. Pink declares that somebody must have made them. Yellow rejects this idea although he notes that they are "so intricate, so perfect." He proposes time and chance as the preferred explanation: "With enough time – a thousand, a million, maybe two and a half million years – lots of unusual things could happen. Why not us?" Pink however declares that idea to be "preposterous." Thus the puppets engage in dialogue.

Yellow proposes hypotheses involving 'natural processes' while Pink expresses skepticism in the form of further probing questions. The discerning reader will notice that Yellow's hypotheses deal only with shape (form). They never deal with function or even the intricacies of form such as joints. Yellow continues his appeal to time and chance with speculations which become more and more improbable. Finally he bogs down and appeals to mystery. This puppet is content in the end to say we may never know the answer, but he refuses to consider Pink's suggested alternative. In the end, a man (whose drawing bears a striking resemblance to the book's author and illustrator) comes along, checks the puppets' paint and carries them away. Neither puppet recognizes that this is their maker.

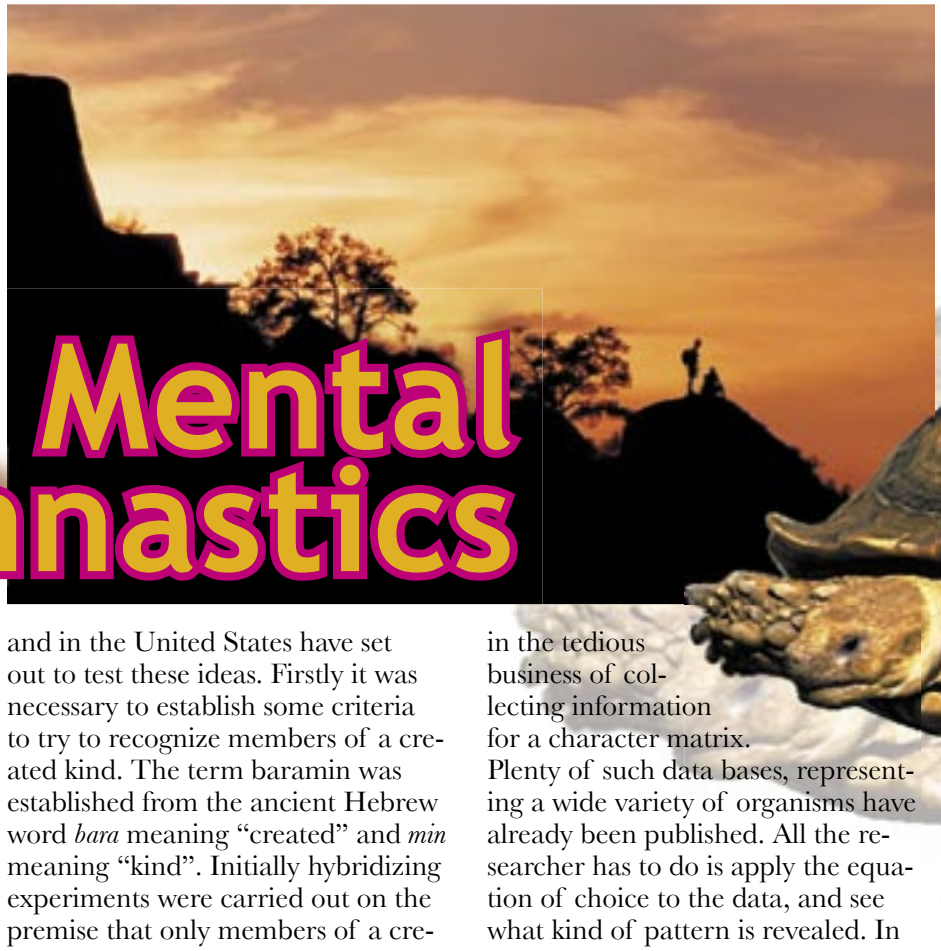
This simple story, illustrated with elegant line drawings coloured pink and yellow, is an obvious analogy to evolutionary speculations. The appeals to time and chance to explain highly improbable events (such as hail stones of the right size falling repeatedly only in the eye sockets) have an all too familiar ring. This is like using time and chance to explain how a particular orchid flower ever came to resemble a particular female bee in appearance, texture and smell.

The author of this little story was a most interesting man. An artist by training, he had provided cartoon-like illustrations for *The New Yorker* magazine for almost forty years, when at the age of sixty, he undertook to write and illustrate children's books. Thus in 1968, Mr. Steig began a new, highly successful career which would span a further twenty years. He favoured stories which encouraged children to think. One device was to sprinkle big words into the text and another was to espouse unusual ideas. For example, in Shrek, he encourages his readers to value strength of character rather than conventionally attractive personal appearance. Thus it is in *Yellow and Pink* that he turns his attention to Darwinian speculations. Perhaps he wanted to encourage critical thinking. Whatever the author's reasons may have been for writing this book, it conveys an important idea by means of an elegant and non confrontational device – a children's story. Buy the book because it is a discussion starter, or as a collector's item, or just because it is fun to read.

William Steig. 1984. *Yellow and Pink.* Farrar, Straus and Giroux. New York. 32 pages.

Mental Gymnastics

by Margaret Helder



There is nothing like problem solving to keep one mentally alert. Some people might say that the study of nature is a form of problem solving and so it is. Collecting information is only half the battle. The real challenge is to try to explain the data.

The vast diversity of living organisms on earth poses a great challenge to all biologists. Where did all that variety come from? There are basically two competing explanations: either separate creations, or evolution. A group of scientists met in Moscow, Idaho last June to compare notes on their research projects. The biologists at the conference approach their discipline bearing in mind that God created organisms according to their kinds (specific body plans) during the creation week. The problem however is that we do not know how large or how small the created kinds are.

Although we sometimes hear the term "fixity of species", no biologist would defend this idea since a precise definition of species is not available. This means that the smallest group which might constitute a created kind would be at the genus level. With the genus *Rattus* for example, various rat species would all be within the rat kind. The idea is that sometime after the creation, individual species have developed from a generalized rat body plan. Many biologists today however suspect that the created kind may be larger still, at the family level. Rats, for example, along with mice, voles, hamsters, lemmings, muskrats and gerbils are categorized into a family of organisms with a roughly similar body plan and behaviours. The next more inclusive clustering of organisms is at the order level. The rodent order includes tremendous variation on the rodent theme such as porcupines, squirrels, prairie dogs and marmots, beaver as well as the rats, mice and voles. Might all these creatures be descendants of one created kind? In this case a dramatic burst of change would be needed at some stage since the creation.

Obviously such questions could degenerate into useless speculation. However some biologists in Europe and in the United States have set out to test these ideas. Firstly it was necessary to establish some criteria to try to recognize members of a created kind. The term baramin was established from the ancient Hebrew word *bara* meaning "created" and *min* meaning "kind". Initially hybridizing experiments were carried out on the premise that only members of a created kind would be able to produce offspring together. Eventually, since not all organisms are capable of sexual reproduction, the definition was broadened to include statistical analysis of many characteristics of organisms.

When a study suggests that a group of organisms exhibits basic features in common, this is said to be evidence of continuity. In this case all these organisms are provisionally assumed to represent the same monobaramin. If a conspicuous difference or discontinuity separates two groups, then each is placed in separate apobaramins or separate kinds. A holobaramin is defined both in terms of internal consistency and external gaps between it and other clusters of organisms. Thus a holobaramin is perhaps a promising approximation of a created kind.

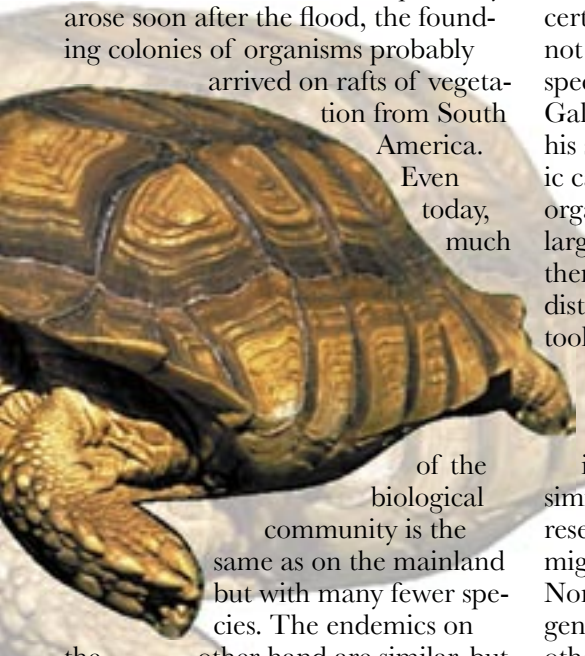
Obviously with computer time and a data matrix the researcher is in business. Further good news is that most scientists do not need to engage in the tedious business of collecting information for a character matrix. Plenty of such data bases, representing a wide variety of organisms have already been published. All the researcher has to do is apply the equation of choice to the data, and see what kind of pattern is revealed. In this context, any topic is available for reconsideration, as, for example, the fabled organisms of the Galapagos islands.

The Galapagos archipelago is a collection of 29 or so volcanic islands of various sizes and elevations. They range in size from a few square metres up to 4700 square kilometers for Isabela. Thirteen of the islands are more than 10 square kilometres in area. The largest ones exhibit the highest elevations, up to 1700 m on Isabela. For most of the islands, the distance to the nearest island is less than 2 km. In addition, almost all of them lie less than 100 km away from the central island of Santa Cruz.

The biological communities on

the islands occur in zones matching elevation. While the largest islands support the highest number of plant and animal species, it nevertheless is the case that the smaller islands exhibit a much higher proportion of endemic (unique) species. While large Isabela has 347 species of which 89 are endemics, tiny Genovesa, with only 40 species nevertheless has 19 endemics. Most of the endemics are found in the arid and transition zones rather than in the tropical highlands.

The question which all biologists seek to answer is where did the endemic species come from. In view of the fact that these islands probably arose soon after the flood, the founding colonies of organisms probably arrived on rafts of vegetation from South America. Even today, much of the biological community is the same as on the mainland but with many fewer species. The endemics on the other hand are similar, but not identical, to mainland species.



The case of the three Galapagos mockingbird species particularly intrigued Darwin. Each species is endemic to a single island. Where did they come from? One possibility is that a single population came to the archipelago. Later, on separate islands, the populations became adapted to different environments. This process is called natural selection. Other explanations are however possible. Three different populations may have invaded separate islands. Similar populations on the mainland perhaps later died out leaving those on the islands as the only surviving representatives. Alternatively a sizeable group arrived together but the representatives which migrated to separate islands differed slightly in their genetic characteristics. Over time further loss of some variability in the three populations caused them to become yet more different. This process is called genetic drift. Another possibility is "mediated design." According to this idea, proposed by Dr. Todd Wood and colleagues, the arriving population had special genetic characteristics preprogrammed to be expressed after the flood as required for survival.

With all these possibilities in mind, Dr. Wood, a biologist at Bryan College in Tennessee, set out to study certain Galapagos endemics. He was not averse to the idea that unique species (endemics) developed on the Galapagos archipelago. He applied his statistical analysis to the taxonomic categories to see if the Galapagos organisms could be grouped within larger baramins or created kinds. He then looked at the endemics and their distributions. Would his statistical tools shed any light on the situation?

The simplest case is that of the Galapagos hawk. There is one endemic species which lives on nine islands. Both in appearance and in similarity of DNA sequences, this bird resembles Swainson's hawk which migrates between the Great Plains of North America and northeastern Argentina. The Galapagos hawk, on the other hand, is extremely sedentary. It shows no inclination to fly over water, even to islands which are close by. So did a large population invade several islands and then later lose its wanderlust? It seems probable.

The famous Galapagos tortoises are a more difficult issue. All island specimens are classified in the same species. Populations occur on eleven islands and each can be distinguished on the basis of appearance and behaviour. The tortoises definitely prefer to breed with individuals from their own island. Thus many people consider each island population to be a separate subspecies. The most conspicuous difference is in the shape of the shell (carapace). Some island populations have a domed carapace (like similar species in South America) while other local populations have a saddleback shape. Neither shape appears to confer an advantage over the other in any of these environments As far as the origin of the archipelago tortoises is concerned, whether the population arriving was large bodied or small, domed or saddlebacked, this study provides few answers.

Among bird groups, Dr. Wood considered the gannets (genus *Morus*) and boobies (genus *Sula*) of which there are three booby species present. He ran his baraminic distance analysis on a data base involving these two genera. The study revealed a clear discontinuity between the two genera. This he elected to ignore on the basis that such small created kinds would be "unprecedented in vertebrate baraminology." Such a result obviously will continue to be unprecedented if no one takes the results seriously. In any case these statistical studies are mere tools, not definitive indicators of relationship.

No data base exists on the archipelago's most famous inhabitants, the thirteen endemic finch species. Nevertheless Dr. Wood concludes that the finches indeed diverged through natural selection into separate species. Each species presumably developed on a separate island and then flew to other islands. Today as many as ten species live together on the islands and no island has only one species. Amusingly in the parallel case of the daisy tree (*Scalesia*), eleven endemic species of which occupy separate islands, Dr. Wood concludes that they diverged probably from a mainland population through drift rather than natural selection.

It is apparent that there are few clear answers. Nevertheless the important thing is that these scientists are asking questions with a Christian focus. In time we will accumulate more insights. Obviously in all areas of biology there are plenty of research topics available for creation based biologists. Many bright young researchers, such as the ones we heard last June, are stepping up to meet this challenge.

IMAGINE THAT

Continued from Page 1

Actually a flower cluster with bracts. Later in the season the inflorescence develops bright red berries which are just as showy as the "flower" stage. The plant obviously takes its name from this cluster of fruit.

The plants are striking in their dense stands, but few people pause too long to examine them since there are usually other, less common blossoms to find and identify. Nevertheless, if one were to sit with a magnifying glass to observe these plants while the flowers are still in bud, we might discover that the flowers open in a spectacular fashion. Measurements on a miniature scale reveal that the bunchberry flower opens so quickly that it out competes some organisms which are famous for their speed. Everybody knows about the snap of the venus flytrap (accomplished in 100 milliseconds or thousandths of a second or ms). Well bunchberry flowers open faster than the venus flytrap closes. Bunchberry flowers even manage to snap open faster than the famous stealth attacks of the mantis shrimp (complete in 2.7 ms).

One might suppose that such a fancy design feature provides the bunchberry flower with a special benefit and indeed it does. These flowers need to receive pollen from another plant in order to set seed. There are various ways to achieve this such as dispersal by wind or insects, but this plant uses another method for enhancing pollination as well. The buds open explosively. In the process, pollen is catapulted to comparatively impressive heights. At the exalted height of an inch (2.5 cm)!! above the blossoms, wind can better disperse the pollen to nearby flowers.

The process goes like this. Firstly the petals, which are fused at their tips, pull apart and move out of the way. This process takes a mere 0.2 milliseconds. As they open outwards, the petals achieve a maximum speed of 6.7 metres per second with the impressive acceleration rate of 22,000 metres per second per second! Once the petals are out of the way, bent filaments which have been holding the stamens in position against a central column (the style of the stigma), now begin to unfold.

Once again we discover that living organisms employ designs that man has also developed, but the latter without the finesse exhibited in nature. In the middle ages for example, armies used catapults to deliver rocks or fire to enemy castles. Specially effective catapults were called trebuchets (from an Old French word "to overthrow"). These maximized the throwing distance by attaching the payload to a flexible strap. This device propelled the payload upward faster than an ordinary catapult could manage. Well guess what! Bunchberry stamens are attached to their filament by means of a thin flexible strap. The whole system constitutes a trebuchet.

Once the petals are out of the way, the bent filaments pull back in an arc. The stamen is then accelerated upward to a maximum vertical speed. Immediately, with a jerk, a cloud of pollen is released. During the first 0.3 milliseconds, the stamens accelerate at up to 24,000 metres per second per second. The duration of the process is so short however that the stamens reach only a maximum speed of 3.1 metres per second. The whole event does not last even a second, only about 0.5 milliseconds. Nevertheless, the result is that the pollen grains are launched to a height of 2.5 cm (more than 10 times the height of the blossom). To put this in context, imagine that you could throw a ball upward to ten times your height in less than 0.5 thousandths of a second . Imagine the lucrative sports contracts you could command!

However, getting back to bunchberry, in quiet air over the forest floor, the pollen may reach a distance of 22 cm (100 times the flower's diameter). With a breeze, flowers a metre away, may receive a dusting of pollen.

It is evident that if these flow-

ers were several cm in diameter, the impressive talents of this plant would be much more famous. When events happen in miniature however, we often miss the action. The source of the energy for the speed and force of the pollen catapult is stored mechanical energy in the form of water pressure in specific cells. Biologists are only now beginning to investigate what allows a cell to release water pressure that quickly. Something impressive is happening, something that we do not yet understand. It is evident that even organisms which seem quite ordinary, may nevertheless exhibit remarkable talents. It is all part of the richness and variety of the creation. (see *Nature* 435 May 12/05 p. 164)

On a tinier scale yet, scientists are continually discovering remarkable molecular machines which work inside each living cell. One such machine involves proof reading. Anytime you or I copy a document, it is always a good idea to proof read the script. Since each cell copies or duplicates its own genetic code or DNA before cell division, the cell would be well advised to check the new strands to make sure there are no copying errors. Not surprisingly, such repair enzymes or proteins actually exist. Many of these work by scanning long strands of DNA for one kind of error only. Since actual errors are very rare indeed, each protein must cruise along the DNA quickly, stopping only when the right kind of error is detected.

One such protein in human cells has been studied in detail. The enzyme 8-oxoguanine glycosylase or hOGG1 for short, seeks a damaged form of guanine (one of four nitrogen bases which form the DNA code). Guanine, you may have heard, always pairs with the nitrogen base cytosine. This is the base pair that hOGG1 specifically seeks. When the guanine is normal, hOGG1 continues merrily along until a guanine with an extra oxygen is detected. This slightly larger molecule is called 8-oxoguanine (oxoG) and it is bad news.

The question now is how does the hOGG1 enzyme detect a difference between good and bad guanine, and what does it do with the bad product? As the enxyme moves along the two complimentary DNA strands, it hesitates when it encounters a CG pair. The enzyme then briefly breaks the CG bond, and flips the guanine outward toward a special pocket on the hOGG1 molecule. If the nitrogen base is indeed guanine, the protein continues on its merry way and the guanine flips back in to join again with cytosine. If however the guanine has an extra oxygen, the nitrogen base fits differently into that first enzyme pocket. The hOGG1 molecule then flips the oxoG back into a deeper pocket which then snips the nitrogen base out of the DNA chain. Soon another protein will come along to insert a normal guanine into the chain.

An extra oxygen may come to be attached to a nitrogen base as a result of free oxygen radicals (we all know they are bad) or as a result of ionizing radiation (worse still). The problem is that when DNA is being duplicated prior to cell division, the duplicating enzyme reads oxoG as a thymine (T), quite a different nitrogen base. Thymine always pairs with another nitrogen base, adenine (A). Thus as a result of an extra oxygen, one could end up with an AT pair rather than a CG pair. Such a change may not matter at all, or it could be disastrous, depending where it is along the DNA molecule. The single base error may cause a cell to insert the wrong amino acid into a protein (or it may not), depending on the position in the gene. Some amino acid substitutions may not matter at all, but others may be significant. The sickle cell mutation, for example, results from a single nitrogen base pair substitution. This mutation results in terribly malformed red blood cells.

It is the shape of the hOGG1 protein which confers its double benefits of speed and accuracy. Apparently a mere 50,000 hOGG1 molecules are enough to review the six billion base pairs of the DNA content of a normal human cell. This is a ratio of one hOGG1 protein per 120,000 nitrogen bases. Happy scanning hOGG1.

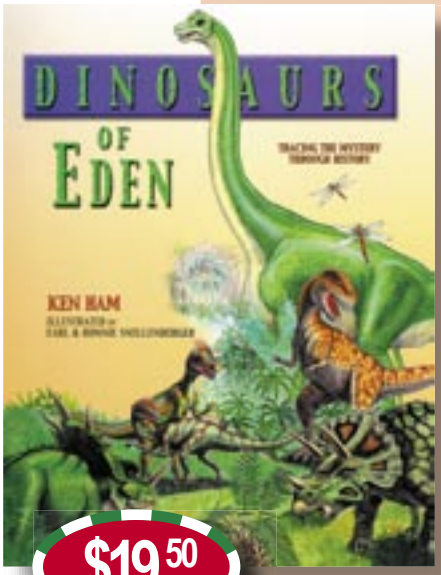
It is obviously important that proof reading enzymes like hOGG1 carry out their very specific proof reading tasks. We should not be surprised by such impressive molecular machines, of course. We already know that all living creatures are fearfully and wonderfully made. Still it is good to remind ourselves of that fact. (see *Nature* 434 March 31/05 pp 569-570 and 612-618).

Dinosaurs of Eden

Ken Ham

The author retells mankind's early days as recorded in Genesis. Also detailed illustrations and commentary demonstrate the occurrence of dinosaurs and other land creatures in the animal communities of the time. A great introduction to dinosaurs for those of elementary age.

Hardcover / 64 pages / full colour



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Dragons of the Deep

Carl Wieland

For too long we have concentrated on scary land based creatures. Those in the sea were more scary! (And more interesting). This book puts ocean monsters past and present into context: size, time and significance. Interesting for all ages from junior high up. Beautifully illustrated.

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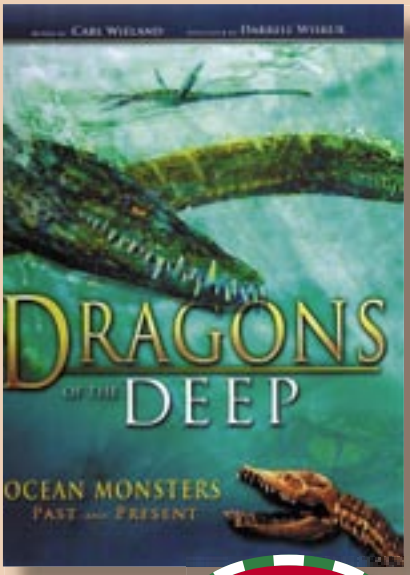

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Grand Canyon: A Different View

Tom Vail (editor)

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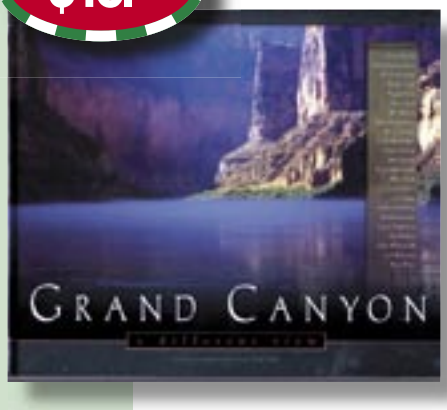
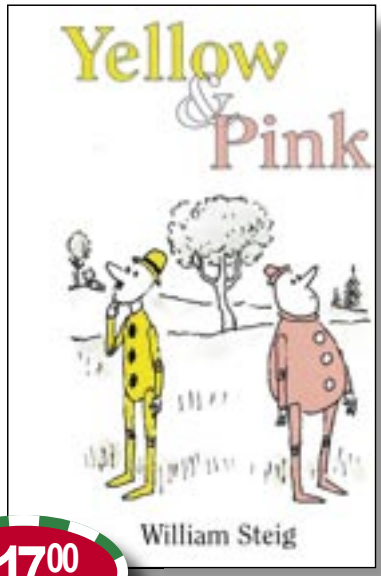


Yellow and Pink

William Steig

Elementary age children, and adults too, will sharpen their critical thinking skills with this classic book, a story about two wooden puppets who wonder about their origins.

Hardcover / 32 pages / line drawings



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