Fossils in the Sky

A book by Duane Bailey

A little about Earth

Earth masses about 1.32×10^{25} pounds. It is about 93 million miles from the sun. Its velocity in orbit is about 66,658 miles per hour around the sun. Its diameter is about 7,930 miles. The sun is about 332,500 times heavier (more massive) than Earth. All these "weights" are given in Earth gravity.

1 mile = 1.609347088 kilometers.
1 kilometer = .62137 miles.

1 pound = .453597024 kilograms.
1 kilogram = 2.2046 pounds.

The "greenhouse effect" explained:

You may have heard about "global warming" caused by pollution. Here's how it works. Our solar system has 4 terrestial planets: Mercury, Venus, Earth, and Mars. These planets have dense insides of rock and metal, and an iron core. However, the crusts of these planets are much less dense. Scientists say that Venus may have been very similar to Earth 4 billion years ago. The atmosphere of Venus is mostly carbon dioxide, which I'll designate from now on as CO_2 so you'll know. Well, the sun shines mostly in the visible portion of the spectrum. But alas, the crusts of typical terrestial planets is at the right density and makeup that it reflects the heat back at longer, invisible wavelengths of light, called infrared. It just so happens that CO_2 allowes the visible light in, but blocks the infrared heat from leaving.

The atmosphere of Venus at the surface is 90 times denser than Earth's atmosphere at sea level, and it's mostly CO_2. 4 billion years ago this CO_2 was bound up in rocks and water. But because Venus is a little closer to the sun, it got hotter than Earth. The extra heat then liberated some of the CO_2 from the rocks and water, which then trapped more infrared heat, warming the planet still more. In turn, more heat liberated more CO_2 etc. until all of the CO_2 was in gaseous form, in the atmosphere. These days the surface temperature of Venus is about 900° F everywhere; equator, poles, you name

it. And the pressure is a crushing 90 times Earth's atmospheric pressure at sea level.

The concerns for Earth are many. Earth also has about 90 atmospheres of CO_2 bound up in its rocks and water, which has never been released. But it could be. Pollution, particularly the burning of fossil fuels, releases CO_2 into our atmosphere. CO_2 is one of the 2 greenhouse gases prevalent in our atmosphere. The other is water vapor. A greenhouse gas allows visible sunlight in, but tends to not allow the longer wavelength, invisible infrared heat (which is how Earth reflects sunlight), to escape back to space. CO_2 and water vapor are about the only 2 reasons why the average tempurature of Earth is above the freezing point of water. (Due to our distance from the sun). So, a little greenhouse effect is good. But there is a possibility of a "runaway greenhouse effect" like what happened to Venus. Scientists are urging the cutback of fossil fuel use. We don't know how long it would take for our atmosphere to suffer a catastrophe, but we don't know how to stop one either. We have burned coal for many centuries, and oil for many decades. Plants eat CO_2 when the sun is out, which is good. We need more plants, not less. But that is not happening. We cut plants down without replenishing the supply of plants in appropriate amounts. As of this writing, many people are aware of the problem. The question is, can we avoid a disaster? Let's try. Plant a tree.

Turn of the Century

Well, I just enjoy writing about science and technology, so here goes. In the 20th century, math and physics has undergone a much larger revolution than many people realize. In 1905 Albert Einstein came out with special relativity, and explained the photoelectric effect. In 1915 is when he came out with general relativity, which he is more famous for. The equation $e = mc^2$ means that mass and energy are different forms of each other. "Matter" has mass. There are 4 forms of matter: solids, liquids, gases, and plasmas. Someone once commented to me that she thought "plasma" was merely a toy word used in science–fiction. But no. A plasma is real. Plasmatic matter has become so hot that some electrons are stripped away, ionizing the element. A plasmatic sodium ion differs from an ordinary sodium ion found in saltwater, in that the plasmatic ion is hotter than its boiling point. Plasmas are common in space.

If you don't know some of these words, you might look them up. Here are some scientists while you're at it: Marie Curie, Erwin Schrödinger, Max Planck, George Gamow, Niels Bohr, Werner Heisenberg, Louis de Broglie, John Wheeler, Bryce DeWitt, Enrico Fermi, Carl Sagan, Grace Hopper.

A slowness to accept the new physics was Hitler's greatest tactical mistake, and it served him right. They tried the atom bomb, but without knowledge of relativity, the project never got off the ground in time. (Whew!)

The basic principle is that mass and energy are different forms of each other. Energy cannot be created or destroyed, only changed in form. When you think of light, you think of visible light. But in the science world, light is only a loose term for the electromagnetic spectrum, which from low frequency to high consists of radio, (TV is actually a part of radio), microwave, infrared, visible, ultraviolet, X–rays, and gamma rays. The

visible portion is only a small portion of light. All these travel at about 299,792,458 meters per second, (or about 186,282 miles per second). Stars shine in other than visible light too. In stars, protons are fused together in what is called the proton–proton chain, to form helium nuclei. The resulting helium nucleus has a bit less mass than the total mass of the particles and nuclei that formed it had, beforehand. This missing mass has been converted to electromagnetic energy ("light"). In stars more than about 2 times as heavy as the sun, this process produces elemental nuclei all the way up to iron. However, even the heaviest stars cannot make anything heavier than iron by fusion. Elements heavier than iron are made in supernova explosions of dying stars, by a process known as rapid neutron capture. A nucleus of iron accepts many neutrons, then it decays by beta decay to the first stable nucleus. Gold is exotic indeed. In this type of beta decay a neutron becomes a proton and electron. The proton stays in the nucleus but the electron is kicked out. Nuclei heavier than iron result.

I've heard it asked many times, "How does a rocket work in space?" "Don't you need air to push against?" Actually, no. The first factor to consider is that whatever comes out of the rocket exhaust has mass. It has been heated, made energetic, and been forced to travel in a specific direction. Remember Isaac Newton: Every force is reacted to with an equal and opposite force. Thus what you must first consider is that you are pushing against the exhaust itself. The mass of the rocket and the mass of the exhaust differ, of course. But the exhaust is traveling incredibly fast. The rocket responds comparatively slowly at first. The rocket and its exhaust part ways from each other relative to their respective masses and energies. True, the air does play a part, but it is only something to take into account when building a rocket. First, know that you are primarily pushing against the exhaust itself, which has mass.

20th century physics would never have been possible without the groundwork being laid by the Renaissance. But even before Christ it was known by some people that Earth was spherical. Look up Eratosthenes. He calculated the spherical size of Earth quite accurately, using an ingenious method. This idea never made it very big, though, until the Renaissance. It is thought by some people that it is only by a fluke that we managed to spend 1,500 years too many discovering what is now known in science.

Computers: Well, here we go. Actually, I do have a little programming experience. I do not want computers to replace pencil and paper. There are practical reasons to keep some old–fashioned pencils and paper around. They are light, and all errors are human errors. A computer is a tool for gaining and sharing knowledge. A public computer program should be fairly easy to use. Say you know a particular program well; MS–Word for instance. Now, there are differences in types of computers. So an XT computer cannot run MS–Word for Windows. But an XT is an old, creaking antique anyway. But there should be versions of MS–Word that can run on minicomputers, versions for mainframes, supercomputers, etc. What I'm saying is that if you know a program well, you should be able to use it anywhere, without extra knowledge about computers themselves. Now, the code for each one of these versions of MS–Word would look different to programmers, but the end result would look exactly the same to you, the user, at the screen. Now, a computer knows only one language, called binary. It is a base 2 math, instead of the base 10 we people are used to. The numbers are 0 and 1, and that's it. A 1 is an electrical current, while 0 is the absence of an electrical current. 1 can be thought of as "on", while 0 can be thought of as "off". A 0 or a 1 is called a bit. A bit is a factual answer of either "yes" or "no", to a factually answerable yes/no type of question. Most human languages are composed of usually no more than 64 or so characters being sufficient for basic communication. A character is a letter, or a number, or a punctuation mark, etc. A character can also be called a byte. However, in English, computers are given a total of 256 characters. How many bits will be sufficient to specify a given character out of 256 characters? The answer is 8 bits, because $2^8 = 256$. However, computer science is not constrained to be character– dependent. In my computer is a silicon chip, about 1.5 inches square and about 2 millimeters deep. It contains about 300,000 tiny locations in it where there may be an electrical current, or its absence. This chip, called a CPU, processes bits. Suppose we were going to compose a picture made out of bits. This picture may be a message that is well understood by both sender and receiver. So we will construct a raster, a two–dimensional array of bits, as shown below.

0 0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0 0

0 0 0 0 1 0 0 0 0
0 1 1 1 1 1 1 1 0
0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0

The 0s are the background, while the 1s are the picture itself. This picture required 99 bits. Computer software is nothing more than sequences of bits. These bits are electrical on or off statuses, and are arranged in just such a way that they cause changes in the hardware components of the computer. The most common hardware device that is manipulated on my particular computer is the screen display. Another common one is the printer. If a sequence of bits is going to be used more than once, it goes into a place called memory. Memory is accessible to the CPU. In the memory of some computers, the bits are arranged in sufficiently complex a way, and the number of bits is large enough, that the human programmer does not always know what will happen next. This is true of some of the robotic spacecraft that are sent to the planets. A programmer on the earth may send instructions to a spacecraft on Mars, say, to turn its camera a certain direction. Suppose that it takes these instructions, traveling at the speed of light, 20 minutes to reach the spacecraft on Mars. But say that in the meantime there is a strong wind carrying dust from just that direction, which would damage the camera. The programmer may not know this. The computer can in some sense "know" this, and refuse to turn its camera until the wind has died down. This "knowing" is no more than long, complex sequences of bits in the memory of the computer, some of which which it generated and arranged on its own. But this behavior was allowed for by its human makers. This concept is generally referred to by a term known as "artificial intelligence". A much better description would be "program unpredictability". Many computer software programs are way more simple than this, are are completely predictable, but the day is coming soon when computers will "know" more and more. Research into program unpredictability goes back at least to the late 1950s. Far more is known today about it, but the research continues.

One of the hallmarks of a "smart" program is that it can actually alter its own sequences of bits, in order to cope with changing situations.

My own computer, which I am using to write this, has a CPU with about 300,000 on/off switches, which is all on one chip. The memory in my machine is a set of 36 chips, which are separate from the CPU, and it can store more than 4 million characters, but only when the power is on. My computer also has an area of memory that is not erased when the power is turned off, as is the above form. It is a set of 5 disks, each 3.5 inches in diameter, on a spindle. This gives a total of 10 sides. This disk system can store more than 640 million bits. It always spins at about 3,600 rpm when the power is on. The information can be changed, but it can also be left the way it is. All told, this is easily sufficient processing power to run a highly sophisticated "smart" program. It takes great skill to make such a program, which is why they are relatively rare and expensive. I think that it will be such kinds of programs, made by caring people, that will play an increasingly prominent role in the world in saving lives, and also in improving the quality of life.

Of the stars

First, the sun's info:

Diameter: 864,000 miles
Surface Temperature: 10,000° F
Core Temperature: 27,000,000° F
Mass: 4.3893586×10^{30} pounds
(over 99% of our solar system's mass is in the sun).
Surface Gravity: 28 Earth gravities

Process in a star's core:

2 protons fuse, and one of them becomes a neutron. The new nucleus emits a positron (a positively charged electron), and a neutrino (a small particle

which travels at the speed of light, but which barely ever interacts with other matter). The proton and neutron huddle against each other. This is called a deuterium nucleus. It accepts another proton, forming a variant of helium, with 2 protons and 1 neutron. This variant of helium then emits a gamma ray (high frequency invisible light). In turn, 2 such variant helium nuclei fuse, forming an ordinary helium nucleus and releasing 2 protons. The 2 protons leave the helium and go off on their own. The ordinary helium nucleus has 2 protons and 2 neutrons. The resulting helium nucleus has a little less mass, overall, than the total added masses of the particles that are in it had, beforehand (including the added mass of 2 emitted positrons; in other words, the emission of the positrons does not account for any of the missing mass). This missing mass has been converted to electromagnetic energy (called "light", which was originally a gamma ray, and also the neutrino has energy). The light made in the core takes over a million years to reach the surface of the sun. (The core of the sun is very dense, 100 times denser than water). It travels at the speed of light (of course!) but suffers many collisions with the sun's matter. In its collisions it loses energy, the wavelength becomes longer, until, finally free, it takes a little over 8 minutes to reach the earth, as visible light. "Living" stars (called main sequence stars) come about 100 times heavier than the sun, and they come about 10 times lighter than the sun. The sun has been around about 4.6 billion years. In about 5 billion more years it runs out of lone protons and dies. The heavier stars live only a few million years or less, while the lightest ones live longer than the sun's 9.6 billion or so years lifetime, perhaps up to 15 billion years. This is related to pressure in the core. The light stars have less core pressure than heavier ones, thus they spend fewer lone protons per second, and don't shine as brightly. A proton and a neutron weigh about the same. These two are in the nuclei of elements. Electrons orbit the nucleus, and are much smaller, with a mass of only about .0005445 that of a proton. Neutrons alone among these three particles have no electrical charge. A lone proton can also be called a hydrogen nucleus.

In the core of the sun and stars, it is very rare that an element has any electrons orbiting it. The electrons roam free, there's too much pressure and heat for them to be captured by a nucleus. Thus, a helium nucleus has an electric charge of 2^+ since it has 2 protons. But helium that comes in tanks, and which is used in party balloons, is different, in that it has 2 electrons

orbiting each nucleus. Its charge is 0. In stars about 2 and more times heavier than the sun, nuclei go on to make heavier elements by fusion; mostly carbon, neon, oxygen, silicon, and finally, at about 10 or more times heavier than the sun, all the way up to iron. In "living" stars more than about 2 or more times heavier than the sun, when they die they suffer an incredibly violent explosion. This won't happen to the sun. But in these explosions, iron nuclei are forced to accept many neutrons at once. Then some of these neutrons become protons, (beta decay) releasing an electron as they do so. The electron is completely kicked out. When this changing nucleus forms a stable nucleus configuration, the beta decays stop, and behold, the really heavy elements form. Yea, prize your silver and gold, they are more exotic than many people know. Once an element nucleus escapes the core of a star, it can cool down enough to begin accepting electrons. Many nuclei, both heavy and light, are blown completely off of an exploding star, accept electrons, and eventually get incorporated into a new solar system (like ours, 4.6 billion years ago). I have been discussing nuclear fusion, which can only form nuclei up to iron. Remember, the elements heavier than iron can only be formed by neutron capture, (discussed above), which is completely different from fusion. There are two types of beta decay; in one, a proton becomes a neutron and emits a positive electron and a neutrino, (discussed at the beginning), and in the other, a neutron becomes a proton and emits a negative electron and an antineutrino.

Even more exotic are the cores of stars which have died. These range from white dwarfs, (which is our sun's fate), whose matter would weigh about a ton per teaspoonful on Earth. Next are the neutron stars, which are far denser (and made only of neutrons). And finally, much denser yet; black holes, from which even light cannot escape, due to the high gravity. These objects are governed by rules not fully discussable within in the scope of this paper. A white dwarf is composed of elements and nuclei which are in the so–called "electron degenerate state". This is a state of matter so dense, that even though almost all the materials are above their respective boiling temperatures, whatever electrons they have captured are forced into a crude mock–up of their ground state, (close to the nucleus), only by the pure force of gravity. Ultimately our sun will become a white dwarf. In a neutron star, the force of gravity actually melds the electrons into the protons. A proton plus an electron equals one neutron. These new neutrons are added to the

neutrons already present, and what you end up with is a star made more than 99% of neutrons. These neutron stars far surpass the density of white dwarfs.

When the sun is a white dwarf, it will weigh only a little less than it does now, but its diameter will be about 8,600 miles, only a little larger than that of Earth. (Now that's dense!) If we were somehow able to add lots of white dwarf material to this white dwarf, its diameter would actually shrink, even though its weight were increasing. At 1.33 times the sun's mass, its diameter would be only about 3,450 miles, less than half Earth's diameter. Finally, at 1.4 sun masses, electrons would be forced to penetrate protons, forming new neutrons. The object would collapse violently and a neutron star would form whose diameter is only about 12.4 miles. Suppose we could add much neutron matter to this new creature. It would shrink again, but less this time, until at about 3 sun masses it would have a diameter of about 11 miles, and would become a black hole, (from which light does not have escape velocity). Once you add material to a black hole, it no longer shrinks, but rather it increases in size, in contrast to white dwarfs and neutron stars. (That is to say, the sphere of gravity made by a black hole, which traps light, can only get larger, as the black hole sucks in more matter from space. The star itself no longer has any 3–dimensional size, we call it a "degenerate" sphere). The spherical edge of the gravity where light disappears forever, can only get larger. All these strange star creatures, the dead cores, have differing masses and diameters. Stars are strange in that their final days can evolve differently, depending on extraneous factors, due partly to the fact that many stars, perhaps up to half of them, are actually in "binary systems". (That is, 2 stars orbiting each other, some of them quite close to each other). What counts in terms of the gravitational force of a sphere, is the ratio of the sphere's mass to its surface area. An exploding star, also called a supernova, can produce either a neutron star or a black hole. What causes the explosion is the violent collapse of neutron material to a small diameter. Then the collapse suddenly stops. Meanwhile the outer layers of the star are careening inwards at high velocity, and when they hit the core of neutrons which has suddenly stopped collapsing, these outer layers rebound violently outward, usually blown permanently away from the core. A supernova can be brighter than 400 billion times the brightness of our sun. Though a star may spend hundreds of thousands of years preparing to explode, the explosion itself takes only several seconds.

Final notes: I have read a theory that there is a huge black hole at the center of our Milky Way galaxy, which keeps eating stars. It may weigh 10 million suns or more. I have also read a theory that a few stars that were only about 2 to 10 times heavier than the sun can sometimes explode leaving nothing behind in the way of a core. This may be uncertain, but it could explain the infuriating differences I have found in my research of stars only a very few times heavier than the sun. The largest "living" stars have a diameter about 1,000 times the sun's diameter. Once a star dies, the nuclear fusion stops. In supernova explosions, a core made of white dwarf material is fed by the outer layers of the star until it reaches the critical mass of 1.4 sun masses. There are black holes weighing in at less than 3 sun masses, because of the pressure of the explosive forces of a supernova. Accordingly, they are less than 11 miles in diameter. When a helium nucleus leaves a star, it can gain 2 electrons. If a helium atom is blown apart, what about the missing mass? Well, it turns out that it's missing only from the electrons, (a transfer of mass property during the electron capture) which can regain that little bit of substance by soaking up photons of light.

Research

The following is a short little advice on research. So many people launch into a science career and/or hobby, wanting to make data. What I say is that there is a tremendous large amount of data out there. Research involves reading what someone else did, and how they did it. You should get into the history of how they came up with their data. Know what it meant to that person to learn what they learned. Society cannot amass knowledge, always pushing to create more external knowledge in books and other media, without reading into something of what has already been done. To do so would be a great mistake. There is a time to pause, and go over what someone else did, and even to go over what you have done. It's not wrong to make history, to make data. But it's also interesting and wise to read over previous works.

There is such a thing as the scientific mainstream. There is also such a thing as bad science. On the other hand, the scientific mainstream is easy to spot once you learn how. Usually there is an ongoing discussion on something very specific. For instance, the case of the missing neutrinos. The mainstream supposes that there is a type of neutrino that we don't know how to detect yet. Therefore, nuclear physics would not be in jeopardy (whew) and the neutrinos are there after all. This isn't proven, but it's a case in point of an educated guess. There are some authors I have read that tend to suppose nuclear physics is wrong, that the neutrinos really aren't there. To my mind, this is merely a fashionable out for people who have no imagination and who wish to appear "properly skeptical" about things. That's my opinion. You may begin to learn to spot the so–called "devil's advocate" in the science world. Then there are those who secretly agree with the mainstream but who, for whatever reason, want to lie publicly about what they believe. Remember, the research that has been done is valuable. You may also arrive at some data of your own. Record that in excruciating detail. Have no pity on your prospective reader's boredom threshold. A true researcher will read with great fascination what you have achieved, and what you got for results.

God and science

When I write, it is usually about science. This time, however, I wish to write about my Christianity. Therefore, fellow scientists, be not dismayed if on occasion I talk about something not proven by the scientific method. I want to approach the subject my way. I do not find impossible the marriage of these two different disciplines, and I shall attempt to explain how I live quite comfortably in both. To do this I will have to switch between the two modes of thinking.

First of all, I believe quite literally in the God of the Bible. I have read several other "religious" writings besides, but I have not found in them anywhere near the depth of meaning the Bible has for me. But secondly, to my knowledge, the sun and earth took millions of years to complete their accretion. This tells me that God is an exceedingly patient craftsman, and that he does not feel obliged to explain to people what the word "day" means to him. About 4 billion years ago, the first DNA molecule was born. DNA is also called "genes". All plants and animals on the earth are ruled by DNA. No contending molecules have survived, possibly because DNA was a tough competitor. Then came cells, followed by water plants. Then came worms, then invertebrates, plankton, fish, and vertebrates. This is a rough sketch without detail. Remember that Moses began writing Genesis, at God's command, about 2,500 years or so after the creation of Adam. In order to keep you from becoming confused, I remind you that there are two different modes of thought at work here. Now, according to the "begats" in the Bible, as studied by scholars of the subject, Adam was created about 6,000 years ago. About 3,500 years ago is when Moses was commanded to begin writing. Before this time, there were no God–inspired writings that we are aware of. I find it perfectly reasonable to believe that God did indeed inspire the Bible. God is infinitely old and powerful. I like to say that he can know

all, but that he is so powerful that he is not in any way "required" to know all. If he chose to give your thoughts an hour of privacy (by our standards of an hour) an hour of privacy is what you would have. (Remember, though, if he changed his mind later, he could know what that hour of thoughts contained). I believe literally that God commanded Moses to begin writing about 3,500 years ago; but I do not believe the idea that our species is only about 6,000 years old.

Believe it or not, a true scientist rejects the "new age", partly for his/her own scientific reasons. It seems that here, though, is at least something that Christians and scientists have in common. Both believe it is erroneous, and in some cases dangerous. The name itself, though, may need revising. Even in the times of Moses we read of the same kind of lame–brained hogwash that is found today in "new age" philosophy. I sometimes wonder if proponents of things like astrology, out–of–body experiences, reincarnation, and so many other vulgar things really believe so much in this stuff, or if rather they are really just trying to lead the faithful away from truth. That would make them conspirators. They may have known exactly what they were doing in leading God's people astray. Not only that, but there is no scientific evidence today in support of the claims of the "new age", and there is overpowering scientific evidence against them. However, if someone has people convinced of his/her own special powers, he/she stands a good chance of getting rich. There are many cases that are proven to be exactly this, whether by the bamboozler's own admission (after they get rich), or by a scientific shakedown and investigation. This battle has raged for at least 3,000 years (the approximate age of science). However, God's own war with these people goes back further.

Just think, if we ever discover other life out there in the universe, what a great thing we or our descendants will have to share with them! God, who made all, came to the earth, visited our ancestors, and spoke to them also. And he speaks to us today, through the Bible. This may not have happened to any other civilization in the universe. This other life, however many kinds we find, will not have DNA as their ruling molecule. Generally, for every planet on which life has evolved, there are exactly that many different ruling molecules. That makes you far more related, in the most fundamental way, to a tree or a bird than to any being from a different planet.

Now, there are a few writings that some people say are Christian, or at least as valid as the Bible. The most notorious in my mind is the book of Mormon. Mormons say that after Jesus was done in Israel, he stopped off in America, and gave extra teachings. I don't believe this one bit. Another erroneous religion is Islam. Now, Muslims say that the greatest prophet was Mohammed. But he can't even be a prophet, since he came after the Bible was complete. They don't hold that Jesus is the son of God, as Christians do. They say he was only a prophet. (Imagine that!) But I know that the only God–inspired writings are found in the 66 books of the Protestant Bible. I'm like, hey man, look, my I.Q. is 142, and I've been around. I talk to the Lord all the time, in real time. However, he never commands me to write about it. He has assured me many times that the Bible is the only inspired literature in existence.

Now, there were an additional 16 or so books written during the events of the Old Testament. These extra books appeared in many Bibles, especially in the early Catholic faith. These extra books are called the Apocrypha. But the best authorities have always said and continue to say that though the writings are okay, it's just that they weren't God–inspired (which almost everyone knew all along anyway). The Reformation of the 1400s and 1500s, in which Protestantism was born, went ahead and deleted these extra books.

I manage to be quite comfortable as a scientist, who happens to be a Christian also. But in order to maintain harmony, some doctrinal sacrifices have to be made on both sides. I shall leave it up to God, and not people, to reveal the ultimate truth to me.

"Fossils in the Sky"

In this chapter I will go into several different subjects. Welcome to the meanderings of my mind! I thought of the title of this chapter and therefore the book, while watching cloud formations in northeast Illinois, where I lived for 16 years. There, every third rock you pick up is a fossil, whether plant or animal. You get used to seeing them, and I began to see them in cloud formations. Now, the fossil record clearly shows that we people have been the same species at least a million years. Did the events of Genesis take place longer ago than commonly supposed? What do we suppose? Whom did Cain marry? Read Genesis chapter 4, paying attention to the sudden dicontinuity introduced in verse 17.

Instead of attempting to disprove the creation as stated in Genesis, I'm attempting to make sense of it: Let's think of a world 4.6 billion years old, to which God himself descends. In this world model, there are about 5 major classes of races of people already present. Now, there are finer and much smaller subdivisions within each major category; for instance the difference between a Middle–East Caucasian (black hair, but light skin), and a true

European (the only subdivision containing blondes! –That's me). Suppose that God created Adam from the dust, and Eve from Adam's rib, in the year 4004 B.C. So Cain's wife would make sense if she were already here. Her people would already have been around a dizzying long amount of time. Possibly this would make sense of the phrase that "Jews are God's chosen peoples". Perhaps God's plan to redeem us would begin there if that is where the first people came along, a million years ago. I do happen to believe the creation of Adam and Eve 6,000 years ago. But this wasn't the beginning of the world or people. There are so many gaps and open places in Genesis. How I have longed for them to be filled!

Now, we Protestants believe that the son of God was truly begotten, not made. That is, God is his father and Mary bore him. In the Gospel of John, one of my favorite concepts is found continuously throughout the book: Jesus is the embodiment of the word of God, and that he does not speak very much on his own authority, but usually on God's say–so. John 1:1 says that "In the beginning was the Word, and the Word was with God, and the Word was God". This is, to me, a 2nd story of the creation –in the first, we have the story of people being born "of the water" (amniotic fluid), and in this 2nd rendition, we have the story of people being born of the Spirit (as Jesus counsels Nicodemus throughout John chapter 3).
The most basic forms of life are ruled entirely by genetics; this is true for amphibians on down the evolutionary scale, down through fishes and below, etc. Above the amphibians are the reptiles, whose brain, though simple, can still occasionally override genetic orders. Above reptiles are the birds and mammals. So far, people are the only mammals, indeed, the only known creatures, to have acquired significant amounts of extrasomatic information (that is, information stored outside the body in various media). We have truly taken our physical destiny into our own hands. Once information stored outside the body can override even our incredibly complex human brain, then humans may already be evolution's boss. In Genesis 1:24–29 is the account of how God made people to have dominion over all other earthly creatures. If you have any questions about our dominion over the earth now, all you have to do is go to any metropolitan city! But anyway, what I'm saying is that it is just conceivable that we truly are "perfected", complete with dominion over evolution. We are now adaptable to any environment on the surface of the earth, by using our intelligence and our tools. No other

earthly creature can say this. Surely other creatures will be changed, and I would suspect that it would be the ones not domesticated very much by people.

In the time of Jesus, a Samaritan was simply a product of a prior Syrian invasion and the accompanying inter–marriages. They were looked down upon. I'm less strict, I wouldn't look down on Samaritanism. But personally I would never get a woman from one of the other 4 or so major races pregnant. I want there to remain at least some variety in this world.

Let's pretend that today something happens which causes physical death to stop happening to people. So you and I would then "live forever". But alas, we would never come any nearer to God's wisdom; there is a time before which we did not exist. So logically, even then our lifespan would be finite! God, on the other hand, is infinitely old. Well, I hope you have enjoyed my thoughts as much as I have enjoyed committing them to paper. I welcome any suggestions or comments you may have.

Acting

I'm fascinated by some people in our past. Many of them, it seems, did not give up hope for their dreams to come true. I have been idly flipping through a picture book of great actors going back to the beginning of movies. Acting is therapeutic for those who enjoy it. It allows them to let images roam free in their mind as they work. Acting is thousands of years old, as we know. It's too bad we don't have pictures of all of them. Making plays and movies allows humanity to test creative ways of structuring society, before implementing those changes for real. In this manner, acting has had a very large influence on society, for as far back as history is recorded. Of course,

there have been actors and actresses that I didn't much care for, and there are movies I don't like. I like a good sleuth show. I have tried for many years to be an "amateur sleuth".

I often wonder about our past. I think that it is easy to develop misconceptions about history. The farther back you go, the less detailed the records are. One humorous image that once came to mind several years ago concerns a fictional Jewish family in Old Testament times. A man and his ife have had, say, 5 kids; 3 boys and 2 girls, all of whom are at least past adolescence. Only 1 of the kids is lazy, a boy. After some years of putting up with him, the parents pretty much give up. One day, they were standing around together, with only their errant son around, who is visible and possibly within earshot. The father is thoughtfully rubbing his chin stubble and musing "Gee, he doesn't seem to be of much use, does he?" Leaning lovingly against her husband, the woman replies dreamily; "Hmmm, now that you mention it, I have noticed his idleness". But this is only an exercise in humor. I think that many of our ancestors were as smart as we are. I postulate that we have high technology today mainly as a result of the population boom; it takes a certain number of people to begin and to run a corresponding level of technology. Modern technology is and must be a collective knowledge.

I think that we, today, should look forward to our descendants. We should give them hope. We should be dreaming and planning big things. This is a very old tradition. People have always tried to improve circumstances, not only for themselves but for those who will follow. Also, they have always attempted to create an image; "mental movies", if you will, of what they did and thought. Unfortunately, it seems that some of this material has been lost. A little has been lost due to nature, but far more has been lost due to the ravages of barbarians. Today, it's more difficult for these types to wipe out the posterity and the great works of people they envy. (Due to mass storage devices, electronic and otherwise).

Women: Well, here we go. In what follows I'm going to lose some potential friends, but I don't give a hoot. The role of women in history is difficult to assess, mainly due to the ravages of the weak–minded portion of the male population. Women have played a major role in history. What seems to

happen is that every so often women are phased out of the history books. At first they are recorded, but somewhere along the line, someone figures out how to erase most of their events. In modern times, this is getting increasingly difficult. Some of the women I have known in my life are the most amazing people. They want to run things, and if I have my way, they will run things. I have often raised pure chaos in order to improve the lot of such women. Some men have gone mad trying to suppress women. Not too bright. It hasn't always worked, has it? Let women be doctors, engineers, scientists, presidents, whatever they are able to acheive. And pay them the same as men. Not all women agree with me. But I think the fiery spirit of vigor and life and challenge recognizes no boundary imposed by chauvinist men, nor by passive females. I don't mean for women to feel pressured to achieve, just don't give in to pressures not to.

Crace: I looked, it's not in my dictionary. Therefore, I shall create a word. Crace, pronounced sort of like grace, means something sort of similar to grace. But there is a difference. Pure grace is attributable only to God. People will have to be content with being able to attain only crace. Crace is a state of being, of goodness, of wholesome living. It is a braveness, a way of dealing with life. People who have crace like the company of others who have crace. If you want to have crace, it helps to be a "people person". Throw away vain envy, and look for the admirable. Often you will learn of someone's hard struggles in life, and how it made that person truly strong. Crace goes beyond pride. Crace helps a person go a long way toward trying to be kind and understanding. Notice that the word grace has different meanings, and that its root, grac, appears in many other words (gracile, for instance). My word, crace, shall not have any other meanings from what I have described above, nor shall it have any other forms. The "Grace of God" has a certain meaning. In sort of this same type of meaning, we shall speak of the crace of a certain person.

A true hero

There is a man I know, I've known him about 8 years. He is the senior pastor of my Lutheran church. At age 16, he was stricken with polio. He has to

walk on crutches. He is over 60 now, but since 1973 he has been pastor of this church. His looks and personality are sort of reminiscent of John Wayne.

This fellow is one of the most cheerful, dynamic people I know. He has more energy than I have (my legs work). He is full of energy and life, and he does his work for God. It takes him about a minute to stand up, but once up he can move quickly. In 1989 and 1990 he used to give me free counseling sessions. That helped, because he already knew my life story. He urged me to go back to school and to get a girlfriend (both of which I have implemented).

How he manages to do all the work that he does is way beyond my comprehension. But he holds his post securely. Many healthy pastors lag behind him. He is a pleasant man, and his sermons are relevant to this world. So many healthy people lack his kind of vitality!

I feel that by watching Reverend Paul Conrad, I have learned to be cheerful and full of energy and full of life, in spite of whatever bad that happens. Some misfortunes can even be turned around to produce good things ever afterwards. How happy is such a person!

Christmas on the moon

Oh, what a vision I see, Christmas on the moon

Let's all take a ride, to that big light in the night sky
we'll celebrate our Christmas all together

Me and just some people that I know and love so well
loneliness is unknown on the moon so far away

Nothing but the mountains and the craters that surround us
the bright light on the rocks looks just like so much snow

What an ornament the moon is, on this Christmas tree
today we'll have a party and sing glory —wait and see

Tonight the universe invites and everyone who loves the light
will celebrate —but don't be late— for Christmas on the moon

About the author:

Duane Bailey has the computer bulletin board handle "Yes Fan". He is a little over 30, and he lives in the deeply cool blue wilderness with his slightly pink girlfriend. He loves lots of trees and castles, and the morning sun shining on gardens of flowers.