Chapter 3: The age of the earth, the fossil record and Noah's flood.

A week later, Xiao Wang and Xiao Li returned to Professor Ho's office, arguing heatedly as they entered.

"Good afternoon boys!" Professor Ho greeted them happily, standing up behind his desk, which was strewn with books as always. "What is it you're discussing?"

Xiao Wang nodded in greeting and launched in: "Professor Ho, I've been researching what you've discussed with us. I have to admit, I'm something of an 'intelligent design' theorist now. But I still have a big problem with your Bible creationism. Scientists have found fossils in rock layers which show evolution happened for millions of years—"

Xiao Li cut in: "I already told him, Professor Ho, that that just means God used evolution! Evolution is God's toolbox."

Xiao Wang shook his head. "That's ridiculous! I've read the book of Genesis and it doesn't look in the least bit like evolution. The fossil record of evolution is a long, bloody process of struggle, death and change. If there was evolution, you don't need a God as a Creator!"

"You'd still need a Creator!" countered Xiao Li. "Life didn't start by itself, and animals wouldn't change into new forms by themselves by accident. Professor Ho proved that to us already. You still need God to drive evolution forward."

"If there's a 'god,' behind evolution, then he's sloppy and cruel. The fossil record looks nothing like the story of the Garden of Eden!"

Xiao Li forced a look of patient wisdom onto his face. "You need to understand how to interpret the Bible," he said, unintentionally sounding very condescending. "The stories in the first few chapters of Genesis about creation and Noah's ark are meant to teach *spiritual* truths—"

"In other words, they're myths!" cut in Xiao Wang sharply.

"I didn't say myths!"

"But that's what you mean! If your Bible has myths right from the beginning, why should I believe it?" Xiao Wang turned to look at Professor Ho as he spoke.

Professor Ho, still standing, had been silently watching the boys argue. "Both of you have half the truth. Xiao Li, you're right that evolution could never have happened by itself without some kind of external intervention. Life never could have started by chance, and different life forms never could have come into existence by chance. If such a thing happened, it had to be driven forward by some kind of outside force—some kind of 'god.' But Xiao Wang is also right: if evolution is true, whatever 'god' drove it forward was not the God of the Bible. There is no way to reconcile evolution with the Bible."

"But what about the 'Day-age Theory'?" Xiao Li immediately protested. "The six days of creation in Genesis chapter one are really just an outline of six ages of earth history, each one lasting an indefinite period of time. After all, the way God counts time isn't like the way we count time. It says in the Bible,

> But do not let this one *fact* escape your notice, beloved, that with the Lord one day is as a thousand years, and a thousand years as one day. (2 Peter 3:8 NAS)

So you see, each day could represent a thousand—or millions of—years."

Xiao Wang looked unimpressed. "What do you think, Professor Ho?"

<u>Can we add evolution and millions of years to the Bible?</u>

Professor Ho turned toward Xiao Li and spoke gently: "Xiao Li, I know a lot of people have used that verse as an excuse for putting millions of years into the Bible. But I'm afraid you haven't been very careful in your interpretation. You've taken the passage you just quoted completely out of it's context. That verse is talking about the nature of God. He is not part of the mass-energy-time-space universe, so He does not experience time the way we do. He stands outside of time. But the events of Genesis chapter one are occurring in the universe and on this earth. That verse simply gives no grounds for adding time into Genesis 1."

"Well," replied Xiao Li, "even if that verse doesn't give grounds for it, you can still reconcile Genesis 1 with evolution. If you interpret it right, there's no contradiction."

Xiao Wang sneered at him, but Professor Ho just asked mildly, "Isn't there? Well, perhaps you can help me to understand it better." He went to a filing cabinet, took out a folder, and invited the boys to sit down around his desk. "Here's a little chart I made comparing the order of some of the events in Genesis 1 with the standard evolutionary interpretation of the fossil record.

<u>Evolution</u>	<u>Bible (Genesis 1)</u>
1. Sun	1. Earth, Day 1.
2. Earth	2. All Land Plants (including Flowering), Day 3.
3. Ocean Life (no mammals)	3. Sun, Day 4.
4. Land Life (spiders, insects…)	4. Ocean Life (including Ocean Mammals) and Birds, Day 5.
5. Reptiles	5. Land Mammals and Reptiles, Day 6.
6. Flowering Land Plants	
7. Land Mammals	
8. Birds	
9. Ocean Mammals	

Now a few questions. Which came first, the earth or the sun? The Bible says the earth; any evolutionary astronomer will tell you the sun. Which came first, whales or cows? The Bible says sea creatures, including whales, came first; evolution says whales evolved when some cow-like creature started wading into the water—a truly absurd idea, but in any case that's what they teach! The Bible says roses came before fish; evolution says the opposite. The Bibles says eagles came first, followed by lizards a day later; evolution has birds evolving millions of years after lizards. Which one is right? They can't both be!"

"Obviously not!" agreed Xiao Wang. Xiao Li was quiet, and his face looked troubled.

Professor Ho continued. "Not only is the order given in the Bible impossible to reconcile to evolution, but the Bible also makes it very clear that God did not use millions or billions of years to create things. Genesis 1 says clearly that God created everything in six days and rested on the seventh:

> In the beginning God created the heavens and the earth… ...And there was evening and there was morning, one day… ...And there was evening and there was morning, a second day... There was evening and there was morning, a third day... There was evening and there was morning, a fourth day… There was evening and there was morning, a fifth day… ...And there was evening and there was morning, the sixth day. Thus the heavens and the earth were completed, and all their hosts. By the seventh day God completed His work which He had done, and He rested on the seventh day from all His work which He had done. (Genesis 1:1—2:2 NAS)

Xiao Li immediately had another objection. "I may be wrong about the verse in 2 Peter, but I'm sure the word for 'day' in Hebrew can refer to more than just a 24-hour period!"

Professor Ho nodded with his gentle smile. "You're quite right, Xiao Li. So we must ask, can we be sure it doesn't mean a long period of time here? In fact, we can.

"A basic rule of interpreting the Bible is 'let scripture interpret scripture.' You'll notice here in Genesis 1 that at the end of each day of creation, we get the phrase, 'there was evening and there was morning, a Nth day.' Each time there's a number in front of the word day. The Hebrew word for day, 'yom,' (יוֹם) is used with a number in front of it 359 times in the Bible outside of Genesis 1. All but *at most* one of those 359 times is referring to an ordinary day (either 24 hours or the daylight portion), not a long period of time.[A] There's no reason to interpret it differently here. The repeated use of 'morning and evening' here makes the case even stronger, since those two words show us a single, earth rotational day is in view. Those words are not used for long, indefinite periods of time elsewhere in the Old Testament.[1,2] In fact, the language of the passage seems to go out of it's way to emphasize: these were ordinary days. Note also that there are words available in Hebrew to express long and/or indefinite periods of time, such as 'olam' (עוֹלָם) and 'dor' (דּוֹר). God could have told Moses to use one of those if He had wanted us to think the six days were six ages!

"But there's more evidence. The ten commandments is one of God's most basic statements of moral rules. In it He gives the six day creation followed by a seventh day of rest as the reason for the Jews to observe a rest day on the seventh day of the week:

> Remember the sabbath day, to keep it holy. Six days you shall labor and do all your work, 10 but the seventh day is a sabbath of the LORD your God; *in it* you shall not do any work…. For in six days the LORD made the heavens and the earth, the sea and all that is in them, and rested on the seventh day; therefore the LORD blessed the sabbath day and made it holy. (Exodus 20:8-11 NAS)

Here the point is made emphatically: creation took six days, and to remember that the Jews were to have a six day workweek. The 'Six days you shall labor and do all your work' obviously means six literal, earth rotational day; why would we think 'in six days the LORD made the heavens and the earth' is *not* literal?

"Certainly Jesus thought they were literal days, not long ages. When He was discussing marriage, Jesus quoted Genesis 1:27 and plainly stated that human beings had existed on earth from the beginning—not appearing after ages of evolution:

> But from the beginning of creation, God made them male and female. (Mark 10:6 NAS)

Jesus is referring to Adam and Eve, two *Homo sapiens* created on the sixth day. This text says 'from the beginning.' The sixth day of a creation which occurred 4,000 years or so before Jesus' time could indeed be called 'from the beginning.' 'Emerging after four and a half billion years of evolution' would *not* be 'from the beginning,' and it's not what Jesus said—nor what He meant."

"Finally, a 'long-ages' compromise means there was death and suffering before sin entered the world—including for the imagined 'ape-man' ancestors of Adam and Eve. As we discussed last week, death is the punishment for sin and did not start until *after* Adam and Eve's sin. That applies to all sentient life:

> For the creation was subjected to futility, not of its own will, but because of Him who subjected it, in hope that the creation itself also will be set free from its slavery to corruption into the freedom of the glory of the

[A] The only conceivable exception is Hosea 6:2, but that verse uses a special literary pattern (compare Job 5:19; Proverbs 6:16, 30:15,18; Amos 1:3—2:6) and cannot invalidate all the other evidence. Furthermore, Hosea 6:2 seems to be indicating a *short* period of time! See the book Refuting Compromise (Note 2).

> children of God. For we know that the whole creation groans and suffers the pains of childbirth together until now. (Romans 8:20-22 NAS)

Death before Adam's sin flatly contradicts what the Bible teaches." [3, 4, B]

Xiao Wang was growing impatient. "Like I said before, I already know you can't mix evolution and the Bible. It's obvious. My questions are about the fossils. Do we need all this discussion?"

"I think Xiao Li might not see things quite so clearly yet," replied Professor Ho quietly. "Xiao Li, perhaps in the past you thought you could avoid these difficult problems about the age of the earth and the fossil record by some compromise solution that combines the Bible with evolution. You can't. They can't both be true."

Xiao Li was frowning unhappily. He seized at a last straw. "But many people say there's a gap between the first and second verses of Genesis. All the fossil record was laid down then, then the world was destroyed and recreated in six days."

Professor Ho tightened his lips and shook his head in frustration, but still spoke gently: "The so-called 'Gap Theory,' is, to be honest, the weakest excuse of all for trying to put long ages into the Bible. There's nothing in the passage or anywhere else in the Bible to support the idea of a so-called 'ruin and reconstruction.'

> In the beginning God created the heavens and the earth. And the earth was formless and void, and darkness was over the surface of the deep; and the Spirit of God was moving over the surface of the waters. Then God said, "Let there be light"; and there was light. And God saw that the light was good; and God separated the light from the darkness. And God called the light day, and the darkness He called night. And there was evening and there was morning, one day. (Genesis 1:1-5)

You can't split apart verses one and two.[5, 6] We just looked at the fourth commandment which says 'in six days the LORD made the heavens and the earth, the sea and all that is in them' (Exodus 20:11), so obviously 'created the heavens and the earth' in Genesis 1:1 has to be included in the six days, not separated from them by billions of years during which the fossil record was laid and then the world destroyed. The words 'formless and void' in Genesis 1:2 do *not* require a destruction of a preexisting creation, but only indicate the lifeless, water covered state of the earliest earth.[C]

"Furthermore, the 'Gap Theory' fails in it's original goal of reconciling the Bible to evolutionary geology because it does nothing to answer the appearance of an evolutionary succession in the fossil record which atheists claim produced us and everything else—without any divine intervention."

"That's my question!" exclaimed Xiao Wang. "What about all those fossils buried in rock layers millions, even billions of years old? Don't they prove that some kind of evolution must have occurred—even if it was started or pushed forward by some kind of god—or space aliens? In any case, it doesn't seem to fit with the Bible."

Professor Ho was smiling now, and nodding as usual. "An excellent and very logical question! The answer is that that fossil rock layers were mostly laid down by a global flood a few thousand years or so ago—maybe ten thousand years ago at the outside. Noah's flood is the key to understanding the geological record."

[Here it is suggested that the reader read Genesis 6:1—9:19.]

<u>The Flood was global</u>

Again Xiao Li had an alternate interpretation. "I've heard that Noah's Flood was a local flood limited to part of the Middle East, maybe Mesopotamia in the modern country of Iraq."[D]

"That's ridiculous!" countered Xiao Wang sharply. "In your Bible it clearly says the Flood covered the earth and killed everything."

"Gentlemen!" Professor Ho interrupted them before another argument started. "Xiao Li, I suppose it was the same people who said you could combine evolution with the Bible who also said Noah's Flood was local?"

Xiao Li frowned, but nodded.

Professor Ho pursed his lips and continued. "The idea that Noah's flood was local was invented to try to fit the Bible with evolutionary geology. Evolutionary geologists deny that there is evidence of a global flood in the rock record, so compromising believers reinterpreted the Genesis flood into a so-called 'local' flood.

"In fact, the widespread sedimentary layers, in some cases stretching across an entire continent, which geologists have discovered are actually very good evidence for a global flood! But in any case," here Professor Ho looked sympathetically at Xiao Li, "it's simply impossible to reconcile the historical record in Genesis with the 'local flood' idea."

Professor Ho started flipping through his worn old Bible again. "First, the language used clearly describes a worldwide event:

> And the LORD said, "I will blot out man whom I have created from the face of the land, from man to animals to creeping things and to birds of the sky… And behold, I, even I am bringing the flood of water upon the earth, to destroy all flesh in which is the breath of life, from under heaven; everything that is on the earth shall perish. (Genesis 6:7, 17 NAS)

[B] For a thorough refutation of the 'Framework Hypothesis' see Note 4 pages 211-250; for a brief treatment, see Note 3.
[C] For a thorough refutation of the 'Gap Theory' see the references for Notes 2, 5, and 6.
[D] For a thorough refutation of the 'local flood' theory, see Note 2 pages 241-285.

> And the water prevailed more and more upon the earth, so that all the high mountains which were under all the heavens were covered. The water prevailed fifteen cubits higher, and the mountains were covered. And all flesh that moved on the earth perished, birds and cattle and beasts and every swarming thing that swarms upon the earth, and all mankind; of all that was on the dry land, all in whose nostrils was the breath of the spirit of life, died. Thus He blotted out every living thing that was upon the face of the land, from man to animals to creeping things and to birds of the sky, and they were blotted out from the earth; and only Noah was left, together with those that were with him in the ark. And the water prevailed upon the earth one hundred and fifty days. (Genesis 7:19-24 NAS [marginal literal rendering in verse 19])

Note the expressions like 'all flesh' and 'from under heaven.' Universal destruction is in view here. The passage is downright repetitive in emphasizing that *everything everywhere* that lived on land and breathed air died. Obviously that's not a local flood!"

"Perfectly obvious!" agreed Xiao Wang.

Xiao Li still wasn't convinced. "But I've heard that could be just referring to everything living in the area where human beings were living then. Just Mesopotamia."

Xiao Wang snorted in disgust, but Professor Ho continued to speak gently. "I'm afraid that explanation doesn't fit with the description of the depth of the Flood waters. It says they covered the mountains to a depth of 15 cubits, which is five to ten meters—"

Xiao Li interrupted him. "But I've heard it said that that just means the Flood covered all the hills in Noah's part of Mesopotamia."

Xiao Wang rolled his eyes and sighed loudly.

Professor Ho continued calmly, "Yes, some people say that—even though it's not at all what the text says. But lets imagine the case where it really was talking about the highest hills on the flat plains of Mesopotamia. To completely cover those, the water would have had to have been more than 100 meters deep—and 100 meters is actually a ridiculously conservative estimate. The water stayed deep for several months. But what would have confined all that water in flat Mesopotamia? Water seeks it's own level. It would have quickly flowed out through the surrounding areas into the sea—not stood up straight at the edge for months!

Artist's conception of the absurdity of a so-called 'local flood' which would cover "all the high mountains which were under all the heavens" (Genesis 7:19). Note 1.

"The reality is, as the Biblical text says, the mountains all over the earth were covered. They were probably much lower than the present mountains, which mostly seem to have risen after the Flood. But it still implies a sea level at least several hundred meters higher than the continents—and that would create a global flood.

"Finally, consider what happened at the end of the Flood. The water took months to recede—months, in fact, before even the lower mountaintops became visible:

> And in the seventh month, on the seventeenth day of the month, the ark rested upon the mountains of Ararat. And the water decreased steadily until the tenth month; in the tenth month, on the first day of the month, the tops of the mountains became visible. (Genesis 8:4-5 NAS)

The Flood lasted about a year. About 150 days into it the ark grounded on a high peak in the mountains of Ararat. It must have been one of the highest in the area, because it took more than two more months before surrounding mountaintops became visible. This was no local Flood!"

Xiao Wang was growing impatient again. "Why all this discussion?" he asked Xiao Li with irritation. "It's obvious the Bible is talking about a global flood. Either you believe it or you don't!"

Xiao Li scowled at him silently.

Professor Ho answered Xiao Wang for him. "Many sincere Christians, who've been fooled into thinking geology has 'proven' there never was a flood, have tried to reconcile their (mistaken!) 'scientific' beliefs with the Bible by this local flood compromise. But in fact, it's simply not possible without grossly distorting the meaning of Genesis. I know this seems tiresome to you, Xiao Wang, but there are a couple of more points I want to make about it for Xiao Li's sake.

"If the flood was local, why would God have Noah build an ark? It would have been far, far simpler to just tell him to move out of the flood area! Do your remember the judgment God sent on Sodom and Gomorrah? To spare Lot, God simply told him to move out of the affected area.

"By the same token, why tell Noah to take all the animals? At most, he would have needed to take those unique to the local area. He certainly would not have needed to fill an immense boat with representatives of every air breathing kind.

"But there's an even more serious problem. If Noah's Flood was local, it makes God a liar, because He didn't keep His promise. You remember after the Flood God promised:

…and never again shall the water become a flood to destroy all flesh. (Genesis 9:15 NAS)

If that was a promise to never again send a local flood which would devastate an area, it's a promise which hasn't been kept! There have been countless local floods since then, some of which killed hundreds of thousands of people. Obviously the author did not intend for us to think of a *local* flood never happening again!"

Xiao Li was silent and looked somber. "I guess I never thought about that before," he admitted at last.

Xiao Wang looked at him and shook his head without saying anything. Then he turned back to Professor Ho. "It's obvious the Bible is talking about a *global* flood. But is that really believable? How could the ark have carried so many animals?"

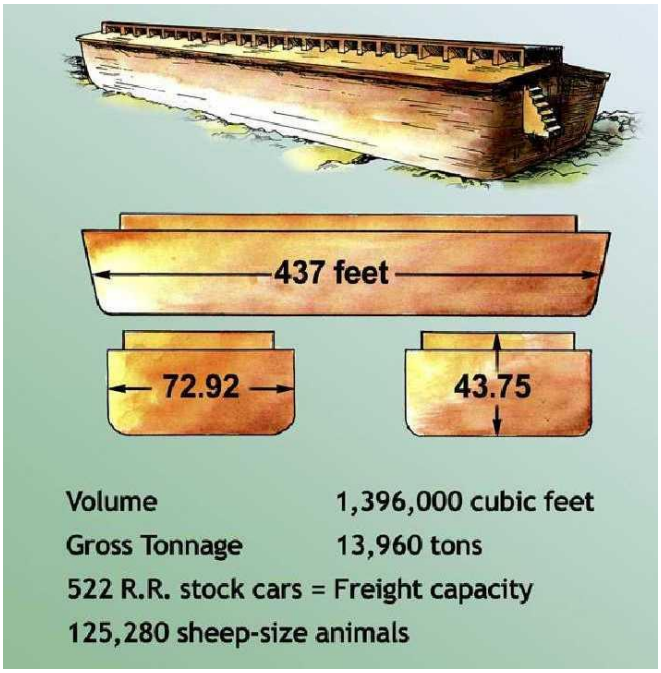
Could the ark have carried so many animals?

"A reasonable question," agreed Professor Ho. "The issue you raise basically implies three questions:

1. How much space was on the ark?
2. How many animals were on the ark?
3. How much food and other material would those animals require?

The most thorough analysis to date was done by scientist John Woodmoreappe in his book Noah's Ark: A Feasibility Study.[7] Woodmoreappe examined the feasibility from every angle: space available, food and water needed, disposal of manure, human labor required, and many other issues. If you are interested in more details, I suggest you consult his work. My answers to the three questions are mostly based on his research.

"We've all seen cartoon representations of the ark as a crowded little boat with giraffes sticking their necks up through the deck—it seems ridiculous. Those cartoons *are* ridiculous, but the reality is something else. Noah's ark was about 150 meters long, 25 meters wide and 15 meters high. It had three levels inside and it's total interior space was about 40,000 cubic meters. That's been calculated to be equivalent to more than 500 standard sized railroad freight cars. It had a lot of room!



Noah's ark was huge, about 150m long by 25m wide by 15m high. It's volume was about 40,000m^2. It was nothing like the 'cutesy' pictures we often see of tiny, overcrowded cartoon arks. Note 1.

"So how many animals were there on the ark? The Bible records that God commanded Noah to bring two of every kind of air breathing, land dwelling animal into the ark:

And of every living thing of all flesh, you shall bring two of every kind into the ark, to keep them alive with you; they shall be male and female. Of the birds after their kind, and of the animals after their kind, of every creeping thing of the ground after its kind, two of every kind shall come to you to keep them alive. … So they went into the ark to Noah, by twos of all flesh in which was the breath of life. (Genesis 6:19-20, 7:15 NAS)

The list above would include birds, mammals and reptiles. In addition, more of a special category of 'clean' animals were taken:

You shall take with you of every clean animal by sevens, a male and his female… (Genesis 7:2 NAS)

'Clean' is not specifically defined for us in Genesis. It probably referred to animals acceptable for sacrifice. These would have needed extra representatives so Noah could perform sacrifices as soon as he got off the ark. We are not told in Genesis how many there were, but later lists have less than ten different kinds.[E] In any case, the number taken on board the ark by sevens was probably too small to make any difference.

"The real issue is, what level of our modern biological taxonomy does the word translated 'kind' refer to? The Hebrew word is 'min' (מִין), and as we discussed before, it usually does not refer to what we today would

[E] See Leviticus 1-5. At a later period, 'clean' could also mean allowed to be eaten by the Jews (see Leviticus 11), but that meaning is unlikely in Genesis since it seems Noah did not eat *any* animals before the Flood.

call a species. It is probably usually equivalent to the 'family' level of modern taxonomy. The great majority of genera and species probably arose from the family level representatives that came off the ark.

"When animals came off the ark, they found an empty world filled with open ecological niches. Different groups would have quickly spread out and become geographically isolated. Then a combination of inbreeding and natural selection would have produced the various genera and species we see today. This is sometimes called 'micro-evolution,' but it is really just the expression of pre-existing genetic variation. It cannot produce new functions or organs; there is no evolution.

"Woodmoreappe calculated that there are about 1,000 'families' of land dwelling, air breathing organisms, including those presently living, those assumed to be extinct but known from the fossil record and also including an allowance for some as yet undiscovered fossil types. Taking a pair from each family, there would have been a total of about 2,000 animals. Furthermore, their median adult weight is only about 100 grams----that is, about half of them were smaller than 100 grams."


L: Fossil dinosaur eggs. R: Artist's model of baby dinosaurs hatching. Dinosaurs were small when they hatched. They did most of their growing after their fifth year. Noah would have taken juvenile dinosaurs on the ark. Note 1.

"But how could Noah have gotten the dinosaurs on board the ark?" asked Xiao Wang.

"Have you ever seen a picture of a dinosaur egg?" Professor Ho asked in return.

"Yes. Oh! I see you point. He didn't take adults!"

"Exactly. There were probably only about 55 created 'kinds' of dinosaurs. Most of them were small even when full-grown, with the average about the size of sheep. For the few larger ones, Noah would have taken juveniles. Interestingly, it's recently been concluded that dinosaurs did most of their growing between the ages of roughly five and twenty years old. Even the biggest of them, the Apatosaurus, would have weighed less than one metric tonne prior to age five—and all the rest were much smaller than that.[8]

"As I said, the majority of the animals were small, with a median weight of 100 grams, and for the few large animals juveniles would have been taken. The ark more than large enough to carry 2,000 mostly small animals with their food, and Noah's family easily could have taken care of that number. But to avoid any argument, Woodmoreappe assumed the taxonomic level carried on the ark was the genus. That increases the number of 'kinds' to 8,000, and the total number of animals to 16,000. That number is almost certainly far, far higher than what Noah actually needed to take—so high that any potential errors about average animal size or food needed are more than covered by the overestimated total number.

"According to Woodmoreappe's detailed calculations, even with 16,000 animals the ark still would have had room to spare. The ark had about 40,000 cubic meters of interior space. Housing the 16,000 animals would have required about 20,000 cubic meters. Remember, the actual median size is quite small, about 100 grams. Their food for a year would have taken less than 8,000 cubic meters, and even their drinking water could have been carried in 2,000 cubic meters. Furthermore, realistically efficient manual labor by eight people would have been enough to care for them. Woodmoreappe did all his calculations based on no machinery or other modern technology being available to Noah. And in reality, there were probably far fewer than 16,000 animals on the ark.

"If you want the details—300 folio sized pages of them!—consult Woodmoreappe's book."

The three sat silently for a few moments, then Xiao Wang raised a different question. "Professor Ho, you've always said God is very loving. Then why did He send a flood which wiped everybody out?"

Professor Ho nodded sympathetically. "I understand how, on the surface of it, it can seem merciless, even cruel."

<u>Noah's Flood shows the justice of God</u>

"Consider how you feel when you see injustice and oppression on earth today. Young girls are kidnapped, raped and forced to become prostitutes. Greedy businesspeople sell tainted food products which will kill infants. Ambitious dictators invade other countries and give their troops license to enslave and kill innocent civilians, even using them for bayonet practice. How do you feel when you think about those things?"

"I feel angry!" Xiao Wang answered quickly.

"And what do you should be done to the people who commit those crimes?"

"They should be punished!"

"Do you think that would be just?"

"Of course! They deserve punishment—in fact, they deserve death because of how they have hurt other people."

Professor Ho nodded. "I agree. We all make moral judgments like this because God has given us a conscience which reflects, in part, His own righteous character. We all recognize that sin deserves punishment, and some sin even warrants death."

Professor Ho fished his old Bible out from somewhere in the pile of books and papers covering his desk where it was lying face open. He expertly flipped to a passage near the beginning. "The feeling we have when we see injustice in the world gives us some idea of how God felt when He looked at society before Noah's Flood:

> Then the LORD saw that the wickedness of man was great on the earth, and that every intent of the thoughts

> of his heart was only evil continually. The LORD was sorry that He had made man on the earth, and He was grieved in His heart. The LORD said, "I will blot out man whom I have created from the face of the land, from man to animals to creeping things and to birds of the sky; for I am sorry that I have made them." … Now the earth was corrupt in the sight of God, and the earth was filled with violence. God looked on the earth, and behold, it was corrupt; for all flesh had corrupted their way upon the earth. Then God said to Noah, "The end of all flesh has come before Me; for the earth is filled with violence because of them; and behold, I am about to destroy them with the earth." (Genesis 6:5-7, 11-13 NAS)

Notice God's description of humanity: 'the wickedness of man was great on the earth…every intent of the thoughts of his heart was only evil continually,' and 'the earth was corrupt in the sight of God, and…filled with violence.' This concise summary implies that humans in general were constantly murdering, oppressing, raping, exploiting, and invading one another. It's a picture of society at a depth of depravity perhaps never seen since then.

"We need to remember that God continued to be in contact with the human race after Adam and Eve sinned. At least at the beginning, everyone knew all about Yahweh the Creator, the Garden of Eden, the Fall and the Curse. But, just like today, most people did not choose to believe or obey God. Finally their willful sin reached a limit that God felt required physical punishment in this life.

"The most important thing to be learned from the Flood is God's attitude toward human sin. God hates *all* sin and will certainly punish all of it. Noah's flood is a concrete example warning us that God's final judgment on sin—eternal hell after death—will be severe and inescapable."

Xiao Wang was far from satisfied. "But it still doesn't seem fair that He killed *everybody*. They can't all have been equally bad, but they all got the same punishment. And what about the little children?"

"That's always troubled me too," admitted Xiao Li. "What about all the babies that died in the Flood?

"A first glance it seems unjust, doesn't it?" replied Professor Ho. "But there are two points to keep in mind here. The first point concerns Xiao Wang's objection that they weren't all equally bad, but all got the same punishment. In fact, in the long run, they didn't all get the same punishment. Mere physical death, whether due to Noah's Flood or any other way, is by no means the full punishment for sin. The full punishment comes afterwards, in hell. The physical death of humans during the Flood was, in a sense, just a symbol of God's wrath and judgment which will come on us after death."

"But that doesn't make it right to have killed all those babies!" objected Xiao Wang. "They hadn't sinned."

"Of course. That leads to my second point," Professor Ho continued calmly. "In one sense, physical death isn't a punishment at all; it's simply a consequence of being Adam and Eve's offspring. As we discussed last week, we've all inherited a cursed body which must die."

"But their lives were cut short! All those babies and small children!"

"What do you mean by 'cut short'?" Professor Ho asked unexpectedly.

"Why, they only lived a few years, maybe only a few days, and then the Flood killed them. That wasn't fair!"

"You imply," said Professor Ho slowly, "that God 'owed' them a certain number of years of life—say seventy years anyway, or, in Noah's day, maybe even several centuries. Why did God 'owe' them that time? Had they done something to put Him in their debt?"

Both boys were silent.

"Physical life is a free gift from God," Professor Ho continued. "We didn't create it, He did, and we didn't decide to bring ourselves into the world, He did. He decides how much time any individual gets. And He never promises to give any one of us what we consider a 'full' lifetime. Your body is only 'on loan' to you—and you're going to have to give it back whenever the real Owner decides!

"So you see," Professor Ho concluded, "God was not unjust to let infants and children die in the Flood. He has the absolute right to end anyone's life whenever He sees fit. As for the youth and adults who died in the flood, obviously they all had already committed sins, so they certainly had nothing to complain about. In fact, society in general was grossly depraved, which was why the Flood was sent."

"But doesn't God have mercy on sinners?" asked Xiao Li plaintively.

"He certainly does!" Professor Ho affirmed. "I've experienced it myself. And the Flood shows His mercy in three ways: there was a warning; there was a way of escape; and there was a new beginning for sinful humanity afterwards."

<u>Noah's Flood shows the mercy of God: The warning</u>

"God told Noah in advance about the Flood and commanded him to prepare a huge boat with enough provisions for thousands of animals. Obviously this would have required some time, and equally obviously other people would have known about it. There might have been as much as 120 years of prior warning. Before the Flood, God said:

> Then the LORD said, "My Spirit shall not strive with man forever, because he also is flesh; nevertheless his days shall be one hundred and twenty years." (Genesis 6:3 NAS)

The first thing to note here is that the Hebrew verb translated '住在' in our Chinese Bible could mean 'contend with, strive with, plead with,' as it is translated in many English versions. If 'strive with' is the correct translation, then 'My Spirit' means God's Holy Spirit which was striving or pleading with the people of Noah's time, urging them to repent, but which would not do so indefinitely. In that case, the phrase might be translated something like: '我的圣灵不会永远劝戒他们'. On the other hand, if '住在' is the correct translation, then 'My spirit' refers to the human spirits which

God has placed in human bodies: "我给人的灵魂就不永远住在他的身体里面". Then the warning is simply that God isn't going to let them live forever. In either case, there was a warning with a time limit given: 120 years. After that, the period of God's patience would end and judgment would come."

"Does that mean people's lifespan would be 120 years?" asked Xiao Li.

"Almost certainly not," replied Professor Ho, "since we know there were at least several generations of people *after* Noah who lived much longer than that. [See Genesis 11:10-32.] One hundred and twenty is probably the number of years before the Flood that the first warning was given. That fits with what the New Testament says about a warning and a preparation before the Flood:

> who once were disobedient, when the patience of God kept waiting in the days of Noah, during the construction of the ark, in which a few, that is, eight persons, were brought safely through the water. (1 Peter 3:20 NAS)

God warned disobedient humanity and was patient with them, waiting perhaps an entire 120 years before He actually brought the Flood on them. They had a warning, and thus they had a chance to repent."

Noah's Flood shows the mercy of God: There was a way of escape

"Not only did God give them a warning," continued Professor Ho, "but He also gave them a way to escape by telling Noah to prepare a huge boat. We have no reason to think that other people besides Noah's eight family members couldn't have gone onto the ark. So far as we know, anyone who believed God could have gotten on. That only eight people were saved is because on one else was willing to repent and believe, so the Flood came on them suddenly and destroyed them.

"You see, it's not that God didn't have mercy on humanity. He made a way of escape and salvation available—but most people were not interested. They had convinced themselves there was no judgment from God to fear. And they had never seen a global flood, so they refused to believe in it when they were warned. But hidden beneath their refusal to believe was a refusal to repent of their sins."

Professor Ho sighed. "Most people today are the same way. They've never seen God's judgment, they've never seen hell, so they refuse to believe in it. But they also refuse to even consider the possibility, because they know in their hearts that a future judgment would mean that they're in trouble—and they aren't willing to change their lives, to repent of their sins!"

What does it mean that 'God was sorry'?

Xiao Li was puzzled by a detail. "Professor Ho, why does it say God was 'sorry that He had made man'? Didn't He know what was going to happen?"

"Yes, He certainly did. And He knew what He was going to do about it, too. You might remember last week we talked about God's promise to Adam and Eve:

> And I will put enmity between you [Satan] and the woman, and between your seed and her seed [Jesus]; He shall bruise you on the head, and you shall bruise him on the heel. (Genesis 3:15 NAS)

It's clear that God knew He was going to send Jesus centuries after Noah's Flood, and so He obviously never had any intention of ending the human race with the Flood. It's clear that God knows the future. In fact, He knew everything which would happen in human history before He made the world. Regarding the seed which would bruise Satan on the head, Jesus, the Bible says:

> …you were…redeemed with…precious blood, as of a lamb unblemished and spotless, the blood of [Jesus] Christ. For He was foreknown before the foundation of the world, but has appeared in these last times for the sake of you (1 Peter 1:18-20 NAS)

God clearly foresaw human sin and the need for a Savior before He ever created the world and prepared to send Jesus to die for our sins. So it isn't possible 'The LORD was sorry' means God hadn't expected things to turn out so badly. Instead, the Bible is just using human language to describe God's *emotion*. God's *feeling* was the same as humans have when they experience regret, but those feelings were not because He had not anticipated the outcome."

Noah's Flood shows the mercy of God: After the Flood, a 'not quite new' beginning

"The third way God's mercy is shown in Noah's flood is how He treated humanity after the flood. He made a binding promise to us, what the Bible calls a covenant:

> …and the LORD said to Himself, "I will never again curse the ground on account of man, for the intent of man's heart is evil from his youth; and I will never again destroy every living thing, as I have done. While the earth remains, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease."
>
> …
>
> Then God spoke to Noah and to his sons with him, saying, … "And I establish My covenant with you; and all flesh shall never again be cut off by the water of the flood, neither shall there again be a flood to destroy the earth." (Genesis 8:21-22; 9:8, 11 NAS)

People continued to sin after the Flood, and God knew they would, but God in His mercy promised to never again de-

stroy all life by means of a global flood. He promised that the earth's daily and seasonal patterns would not change, in other words that there would be a general stability in Nature which is necessary to support human life."

"To confirm His promise to all humanity, God established the universal phenomenon of rainbows as a sign."

The rainbow: The sign of the covenant

> And God said, "This is the sign of the covenant which I am making between Me and you and every living creature that is with you, for all successive generations; I set My bow in the cloud, and it shall be for a sign of a covenant between Me and the earth. And it shall come about, when I bring a cloud over the earth, that the bow shall be seen in the cloud, and I will remember My covenant, which is between Me and you and every living creature of all flesh; and never again shall the water become a flood to destroy all flesh. When the bow is in the cloud, then I will look upon it, to remember the everlasting covenant between God and every living creature of all flesh that is on the earth." (Genesis 9:12-16 NAS)

"Why does it say the rainbow would be the sign of His promise?" Xiao Wang wanted to know. "Rainbows are just natural phenomena caused by sunlight passing through rain. Wouldn't they have seen them before the Flood? How could it be a sign?"

"An excellent question," agreed Professor Ho. "Apparently there was a major change in the earth's ecosystem after the Flood. Before that, the water cycle seems to have been different; apparently it never rained. At least at the time of the Garden of Eden:

> …the LORD God had not sent rain upon the earth…. But a mist used to rise from the earth and water the whole surface of the ground. (Genesis 2:5-6 NAS)

It seems that this kind of hydrologic system continued all over the world until after the Flood. Then our present system with rain from clouds began at the start of the Flood. Thus after the Flood humanity would experience rainbows for the first time. God's prediction of the rainbow gave it a symbolic significance to Noah and his descendents, who otherwise might have feared another global flood every time it rained.[F]

A not quite new beginning: Human government established

"Another mercy that God gave us was the establishment of human government.

> And surely I will require your lifeblood; from every beast I will require it. And from every man, from every man's brother I will require the life of man. Whoever sheds man's blood, by man his blood shall be shed, for in the image of God He made man. (Genesis 9:5-6 NAS)

The most basic function of human government is to preserve human life. All of government's other legitimate activities—preventing theft, promoting health and education services, enforcing safety standards, etc.—grow out of this basic mandate. Legitimate political power doesn't grow 'out of the barrel of a gun.' If that were true, whoever had the biggest guns would have the 'right' to force everyone else to obey! Legitimate human government comes from God's delegating to humanity the responsibility to protect life made in His image. Doubtless part of God's intention was to limit evil on the earth after the Flood, so it would not get as bad as it had been before the Flood. Or at least to slow down the depravity somewhat!"

A not quite new beginning: Changes in diet

"After the Flood, God permitted humans to eat meat.

> And the fear of you and the terror of you shall be on every beast of the earth and on every bird of the sky; with everything that creeps on the ground, and all the fish of the sea, into your hand they are given. Every moving thing that is alive shall be food for you; I give all to you, as I gave the green plant. Only you shall not eat flesh with its life, that is, its blood. (Genesis 9:2-4 NAS)

This, too, was doubtless a mercy from God, though on the surface it might seem harsh. God may have made this allowance due to changes in climate after the Flood which made life much more difficult. Fossils found near both the north and south poles indicate that before Noah's Flood there were temperate zone or even tropical plants growing in those regions which are presently frozen year-round. Many species of plant went extinct, perhaps including some formerly very useful to human life. On top of that, an ice age occurred not long after the Flood. Perhaps it was to accommodate these difficulties that God allowed the eating of meat."

"But if God made all the animals, and they have feelings like we do, how can it be O.K. for us to eat them?" wondered Xiao Li. "I remember what you said about them not having soul, but it still—it still doesn't feel right somehow."

"I can understand your feeling," Professor Ho sympathized. "In the beginning, in the Garden of Eden, it was not intended that animals would die, much less that we would eat them. But on a sin-cursed earth, it's permissible to eat them. They aren't made in the image of God, and they're going to die some day anyway."

[F] Some interpreters think rain and rainbows started after the Fall (i.e. at a time later than Genesis 2:5-6) and were occurring before the Flood, but rainbows were not given symbolic significance until God's promise to Noah.

Xiao Wang was concerned about a different detail. "Why was eating of blood forbidden?"

Noah's offering of sacrifices

"Here in Genesis it doesn't explicitly tell us why eating blood was forbidden," Professor Ho replied. "Later on in the Bible there is a record of God's explanation that the blood of animals was a symbol of how He forgives sin:

> For the life of the flesh is in the blood, and I [the LORD] have given it to you on the altar to make atonement for your souls; for it is the blood by reason of the life that makes atonement. Therefore I said to the sons of Israel, 'No person among you may eat blood….' (Leviticus 17:11-12 NAS)

It was presumably in order to help preserve the special symbolism of blood that they were forbidden to eat it. The idea is that the blood represents the life of the creature, just as we would say today that a murderer has 'blood on his conscience.' In this case, the blood, that is, the life, of the sacrificed animal took the place of the human being who had sinned. The sinner deserved punishment from God, but instead an animal was killed in his or her place. Slaughtering an animal and then burning its body symbolized the judgment of God falling on the animal. Such ceremonies said: 'God, I pray that You would forgive my sin and let the death of this animal take the place of the punishment I deserve.'

"This helps us to understand why Noah offered sacrifices:

> Then Noah built an altar to the LORD, and took of every clean animal and of every clean bird and offered burnt offerings on the altar. (Genesis 8:20 NAS)

It isn't explained here in Genesis, but we can interpret it in accordance with the explanation of sacrifices given later in the Bible. Noah and his family were all sinners, even if they weren't as bad as most of the people who died in the Flood. Because they were sinners, they deserved to die in the Flood, too. They were saved from the Flood through their faith in God. But their sin still deserved punishment. Symbolically speaking, the animals Noah sacrificed died to take the place of Noah and his family."

"But that doesn't make sense," objected Xiao Wang. "How can the death of an animal take the place of punishing a human being?"

Professor Ho nodded vigorously. "Exactly! To put it another way, how can a just, righteous God who *must* punish sin ever forgive sinners? Obviously not by killing animals; those ceremonial sacrifices were only symbolic. They were symbols which prefigured God's ultimate solution: Jesus Christ. Jesus Christ was God Himself come to earth as a human being. His death on the cross was to take the place of sinful humans. That's the central message of Christianity: Jesus was sacrificed to take our place in punishment."

"I can't understand that," said Xiao Wang. "If I sinned, I should take my own punishment. I thought you said God was just. Jesus being punished for someone else's sins is not fair or just!"

"It's not fair," agreed Professor Ho, "but it is just. It's what the Bible calls grace. Jesus voluntarily sacrificed Himself to take our punishment. God is like a just judge; he insists that every crime must be punished. God's righteous insistence on punishment for sin is satisfied by having Jesus punished for our sins. All that is prefigured in a symbolic form by Noah's animal sacrifices."

But what about the fossils? And the millions of years?

Xiao Wang dropped his eyes for a moment. It was obvious he was finding it hard to accept all these ideas. It still seemed like mythology to him. A series of images and from textbooks and T.V. documentaries flashed across his mind: dinosaur bones, fossil fish, clam shells buried in deep in rocks…rock layers slowly accumulating over millions and billions of years…simple life forms gradually developing into more complicated ones…. He already didn't believe life could have happened by accident, but he also couldn't see how to fit the fossil into the Bible. Finally he spoke. "Professor Ho, if God really made everything 'according to its kind' and did it a few thousand years ago, then why is there an evolutionary progression in the fossil record, with dinosaurs dying out long ago? And why are the rocks so old?"

Professor Ho gave his characteristic nod. "Exactly! Those are the same questions I asked myself when I got to this point in my inquiry. Let's consider the issues in this order: first the question of the age of the rocks, then the order of the fossils in the rocks."

How old are the rock layers?

"We are constantly being told that this or that fossil is so many millions of years old. The basis for most of those dates is the supposed age of the rock layers where the fossils were found. These rock layers supposedly accumulated across vast spans of geologic time."

"I've heard that those layers are accurately dated by radioactivity," said Xiao Wang.

"That's what I'd always heard, too," agreed Professor Ho. "But when I started to research the issue I discovered there were many other ways to date the rocks besides radioactive decay. To my amazement I found that almost all of the other dating methods grossly disagreed with the radiometric dates. They gave maximum dates which were much, much younger than the billions and hundreds of millions of years we usually hear about. Eventually I realized that all that time had simply never existed. The earth is actually only thousands or perhaps ten or twenty thousand years old. And most of the fossil rock layers were laid down suddenly, catastrophically, during a global flood."

Xiao Wang was surprised—and skeptical. "But all the scientific evidence from geology shows the earth and its rocks are billions of years old!"

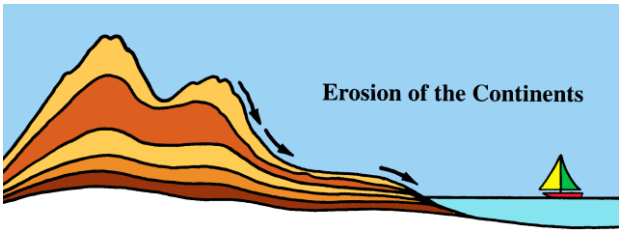
Professor Ho shook his head adamantly. "It's not true that *all* of the scientific evidence points that way; it's just that that's the only evidence you ever hear about in textbooks and on television. In reality, *most* of the scientific evidence indicates a much younger earth. But that evidence is usually willfully ignored by mainstream geologists, so the average person never has a chance to hear about it."

"So what's your evidence that the earth is young?" The skepticism was still evident in Xiao Wang's voice.

Professor Ho smiled, turned to one of his filing cabinets, pulled out a thick folder and opened it on his desktop.

1: Erosion

"For me, the single most persuasive piece of evidence was the erosion rate. All over the world, virtually every surface that is higher than those around it is eroding. That applies not only to mountains eroding into local valleys; even the continents themselves are eroding into the ocean. Erosion is a universal phenomenon and has been very well studied for over a hundred years. Of course the process is very slow—but not nearly slow enough to allow for 'geologic time.' The present average height of the continents above sea level is 623 meters. The presently observed average rate of erosion is about 6.1 centimeters every 1,000 years. At that rate, all of the continental surface above sea level would be eroded away in about 10.2 million years.[9] If we assume that human activity has doubled the 'natural' erosion rate and adjust it downward to 3 centimeters per 1,000 years, one half the observed rate, even then erosion would still have wiped out the continents in a 'mere' 20 million years. Estimates based on the mass of sediments carried into the ocean by rivers give similar numbers.[10, 11] There is no way to reconcile that with the usual figures given for the age of the continents—2.5 billion years or more. The time is simply not there!"

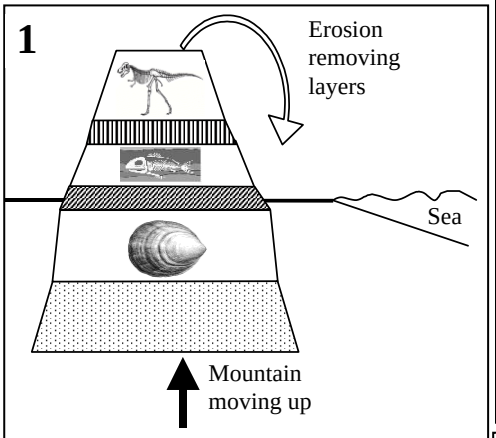


At the present average erosion rates, the continents would be eroded to sea level in less than 15 million years. Note 1.

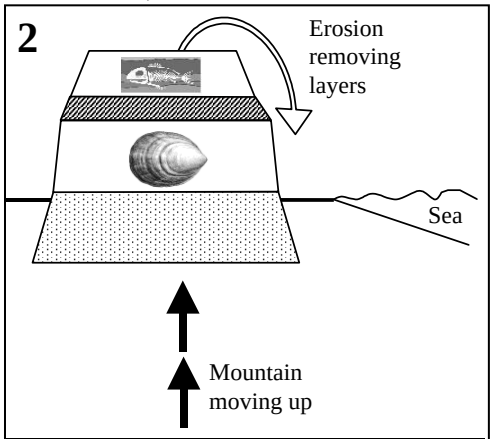
Xiao Wang was doubtful. "Maybe there's another explanation. Maybe erosion was slower in the past."

"That's a favorite excuse of conventional 'long ages' geologists. But they never attempt to quantify what 'slower' could have been, they never put a number on it, because they know it wouldn't work. Even one-tenth the present rate would still be far, far too fast—and there's no reason to believe the average rate was ever that low. The fossil record generally indicates lush vegetation in the past, implying average conditions the same as the present or possibly generally wetter than now—not drier.[12] And wherever there's rain, there's erosion!

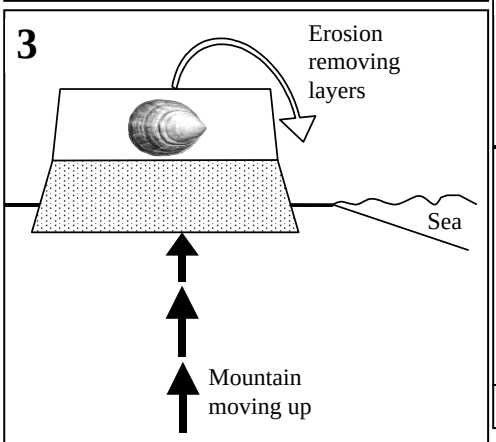
"The problem is actually even worse than this. Erosion in mountain areas is far faster than the average—about 20cm per 1,000 years in relatively dry mountains, 42cm per 1,000 years in wet ones.[13] The average of those rates (31cm) ongoing for 20 million years would mean 6,200 meters eroded away! That's vastly greater than the average height of most mountain ranges—there'd be no mountains left! It's impossible that that much time has passed.



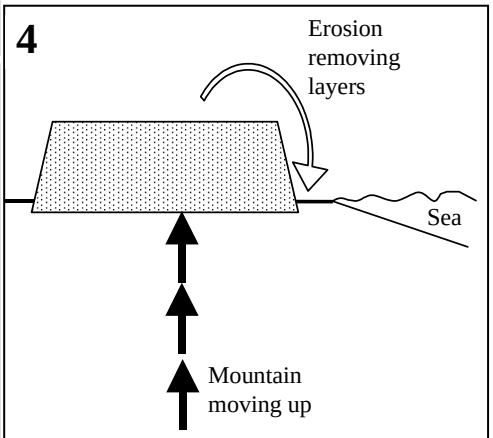
Start: dinosaur, fish, clam fossil layers.



5 million years: dinosaur layer gone.



10 million years: fish layer gone.



15 million years: ALL fossil layers gone.

"Of course the evolutionist will point out that some of the mountains would continue to rise from below, which is quite true; many of them are rising today. But as they continued to rise, pushed up from below, the fossil bearing sedimentary layers would erode away and eventually you would have only fossil-less bedrock—bare granites like much of the Canadian shield.

"Most mountain areas have plenty of fossils throughout their height; you can find seashells on

Mt. Everest! Obviously, when these fossils were buried the sedimentary layers that they're in were much lower. Then they were uplifted. Now they're being eroded away. How long could this process continue until the topmost layers had no fossils?[G] Here's the conclusion of scientist Ariel Roth whose training included biology, zoology and geology:

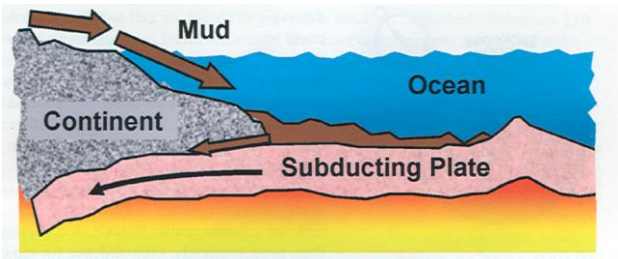
> Although mountain *are* rising…the process of uplift and erosion could not continue long without eradicating the layers of the geological column contained in the them. Just one complete episode of uplift and erosion of the sedimentary layers…would eliminate them.
> … Mountains, where erosion and uplift are unusually rapid, do not seem to have gone through even one complete cycle of uplift and erosion, yet if present rates of erosion and mountain uplift operated in the past, we could…expect at least a hundred cycles of uplift and erosion during the proposed geologic time.[14]

Dr. Roth's point is that old fossils on mountains would have been eroded away long ago if the mountains really were tens or hundreds of millions of years old. The fossils are still there because the mountains are not that old!

"Let's take a specific example. In the eastern United States there is a long mountain chain called the Appalachians. They are what is called 'fault block' mountains, rising straight up from below. Conventional geology says they started rising 250 million or more years ago.[H] In that amount of time, eroding at 31cm per thousand years, 77,500 meters of rock would have been removed. Of course that never could have happened; that's thicker than the deepest areas of crust on the earth! But that number tells us that uplift and erosion continuing across millions of years would certainly have removed the fossil layers. If the Appalachians really were 250 million years old, there couldn't possibly be any fossil bearing layers left, only barren bedrock from the greatest depths. But in fact there are plentiful fossils in the top layers of the Appalachians; the erroneous date of '250 million years' is based on them! If the Appalachians were anywhere near as old as most geologists claim, they either wouldn't exist at all anymore, or, if they had kept on rising and eroding, wouldn't contain any fossils at all.

"The solution to the conundrum is: the time isn't there. The Appalachians aren't 250 million years old. They aren't even one tenth that old, and neither are the fossils they contain."

2: Sediment into the ocean



At present rates of addition and removal, all the sediment currently on the seafloor would have accumulated in no more than 15 millions years. Note 1.

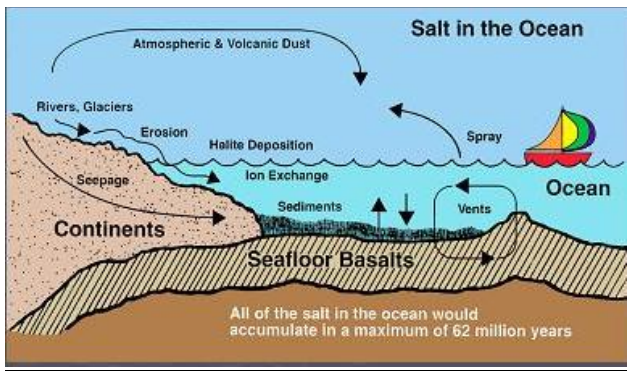
"Where does all that eroded material go? Much of it runs off into the oceans. There most of it eventually settles to the bottom and accumulates. The average depth of sediment in the ocean bottom is less than 400 meters.[15] What's the maximum amount of time would take to accumulate that much sediment? Estimates based on currently observed rates are around 12 million years[16] or 15 million years.[17] An ultra-conservative estimate, assuming the lowest conceivable past input rates and the largest conceivable presently existing amount, sets an upper limit of 100 million years to accumulate what's there now.[18] Needless to say, this grossly contradicts the conventionally claimed age of 2.5 to 3 *billion* years for the ocean. If it were anywhere near that old, there would be a vastly greater amount of sediment. In fact, the oceans basins would have been completely filled with sediment long ago. A small amount of this sediment is shoved back under the continents in a process called subduction, but it cannot possibly account for more than 25% of the input, and probably amounts to much less than that. It cannot fix the discrepancy. The time is not there."

"But you have a problem too," objected Xiao Wang. "You said yourself that you can't fit 100 million years, or even 12 million years, into the Bible."

"You have an understandable confusion here, Xiao Wang. I didn't say the ocean *is* 12 or 100 million years old, I said that's *the maximum* it could be, in view of the sediment accumulation. If sediment entered the ocean faster in the past, it would not need to be that old."

"That seems like an *ad hoc* assumption on your part!"

"Actually, it's an integral part of Flood geology. During the latter part of Noah's Flood there would have been massive erosion and run-off from the continents, many orders of magnitude greater than what we see today. Furthermore, in the years after the Flood, precipitation and run-off is believed to have been greater than now, and the surface sediments softer and more easily eroded. These factors readily account for the observed amount of sedi-



Note 1.

[G] "[N]o fossils" here refers to no multicelluar 'body' fossils, such as dinosaurs, clams or plants.
[H] There is disagreement among geologists, with some sources claiming 400 million years for the Appalachians. The older figure would only make the problem worse for them.

ment in the ocean basins."

3: Salt into the ocean

"The sediment carried by rivers into the ocean contains sodium. The gradual accumulation of this sodium in the world's oceans is another way to measure how long they've been there. These calculations have been being made for over one hundred years now, since John Jolly published his work in 1899.

"The problem for the long ages view is simple. The ocean receives more sodium than it puts out. That means it's constantly getting saltier. To calculate it's *maximum* age, you measure the present saltiness and divide by the net annual sodium input. Two creation scientists, a physicist and a geologist, used existing scientific research, which was for the most part done by evolutionists, to calculate the lowest possible level of sodium being added to the oceans and the highest possible level of it's removal.[19] The result is the ocean could not be more than 62 million years old—and, of course, it could be much younger than that![I, 20]

"How do you know there isn't some other explanation?" queried Xiao Wang. "Maybe there's some other way salt is removed!"

Professor Ho smiled. "You can always say that, of course. If I believe the moon is made of green cheese just below the surface, I'll say there's 'some other explanation' for our failure to find it. In fact, scientists have been looking carefully at sodium input and output processes for a hundred and ten years now. For the past ninety years they've been diligently searching for a way to plain away the contradiction between the radiometric dates and the sodium in the ocean. What they've found shows more going in then coming out—a steady increase in saltiness which cannot have been going on for more than 62 lion years. That's the actual scientific evidence, based on processes that we can observe in the present—no green cheese!"

Sodium Input and Output Processes, 10^{10} kg per year.[19]

Sodium-Input Process	Now	Min.	Sodium-Output Process	Now	Max.
1. Rivers: Silicate Weathering	6.2	6.2	1. Sea Spray	6.0	6.7
2. Rivers: Chloride Solution	7.5	7.5	2. Ion Exchange	3.5	5.2
3. Rivers: Sea Spray	5.5	5.0	3. Burial of Pore Water	2.2	3.9
4. Ocean-Floor Sediments	11.5	6.21	4. Halite Deposition	<0.004	4.0
5. Glacial Silicates	3.9	0.0	5. Alteration of Sea Floor Basalt	0.44	0.62
6. Atmospheric and Volcanic Dust	0.14	0.14	6. Albite Formation	0.0	0.0
7. Coastal Erosion	0.077	0.074	7. Zeolite Formation	0.08	0.2
8. Glacier Ice	0.12	0.0			
9. Volcanic Aerosols	0.093	0.093			
10. Ground Water Seepage	9.6	9.3			
11. Sea Floor Hydrothermal Vents	1.1	1.1			
TOTAL:	45.7	35.6	TOTAL:	12.2	20.6

"And all the salt that's there now?" asked Xiao Wang. "I suppose you'll say that came in with the sediments during the Flood?"

"A good point! Logically speaking, a global flood which scoured away the surface of the earth and deposited sediments all over the world could have dissolved a great deal of sodium into the ocean. Furthermore, we don't know how much salt the originally created ocean had.

"When you consider the age of the ocean, it's important to realize that you can't have life as we know it on the continents without the oceans to provide rain and balance temperature and atmospheric gasses. A 'young' ocean means a 'young' earth!

"Here again, the long ages that we read about in the textbooks are not evidenced in nature. The time never existed!"

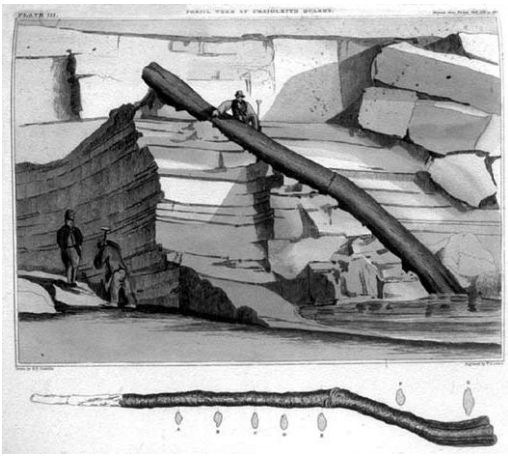
4: Polystrate Fossils

"Let's go from the ocean back up onto the continents for more evidence that the millions of years evolutionary ogists claim have passed actually never existed. We've been taught that the thick layers of sedimentary rock found over most of the world's continents were accumulated slowly over vast periods of time. But the actual physical evidence shows that long periods of time could *not* have passed while the layers accumulated.

"Let's start with the smallest, most local evidence. You know a layer (stratum) of rock is often composed of many thinner layers (strata) stacked on top of each other. Supposedly thick layers took thousands or even millions of years to accumulate. But a ly seen phenomenon shows that these timeframes must be wrong. 'Polystrate' fossils are found crossing one or more layers of rock. These show that the time required to accumulate the sediments the fossil is buried in was less than the time needed for the animal or plant to completely rot away. In essence they 'tie the layers

Polystrate fossil trees. Little time passed while these layers were being deposited. Note 1.

[I] The 62 million year figure is probably an overestimate. Since that number was calculated it has been found that ground water seepage is probably much higher than had been assumed. The actual ground water figure might be a minimum of 37.2 x 10^{10} kg per year, much higher than the 9.3 x 10^{10} kg figure in the chart, which would limit the age of the ocean to much less than the figure calculated here. See Note 20.



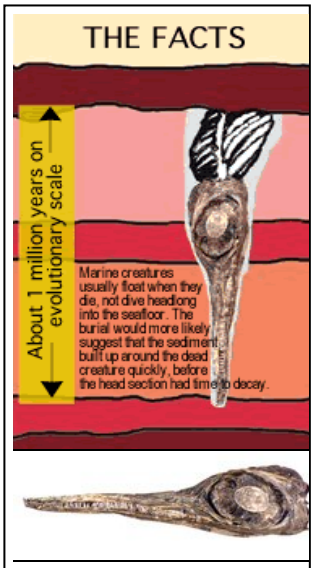
Criaglieth polystrate fossil tree. Little time passed while these layers were being deposited. Note 1.

er' into the same general timeframe. As Ph.D. geologist Dr. John Morris notes:

Polystrate fossilized trees which extend through more than one layer in effect tie the entire series of layers together into a short period of time. This period of time cannot be explicitly determined from the data, but it is wholly incompatible with the long-age model [i.e. tens of thousands or millions of years] normally taught.[21]

"One of the classic examples was found in 1826 in a quarry in Craigleith, Scotland.[22] It cut through a large number of alternating layers of sandstone and shale. Dead trees exposed in the open rot away within at most a few hundred years at most, and usually much less than that. Obviously *all* the layers of stone covering this tree had to be laid down in less time than that. Thus this series of rock layers, which would normally be assumed to require tens of thousands or millions of years to accumulate, must have been laid down quickly. Also there is no reason to think the tree grew where it was fossilized. It was probably washed into place by flood waters which also carried the sediments that buried and fossilized it, which was the conclusion of at least some of the early geologists who discussed it in the 19th century.

"Such trees are quite common, actually. What is even more impressive is polystrate animal body fossils. In 1999 in Switzerland, the 37 centimeter long head of an saur was found buried vertically, head downward in rock.[23] It passed through three layers of rock which were supposed, based on fossil dating, to represent the passage of one million years. Are we to believe that the snout stuck in the mud at the bottom of sea for a million years while sediment accumulated around it? And wasn't eaten, and didn't rot away? Obviously the head was buried almost immediately by all three layers, before other fish could eat it. But then were is the million years which was supposed to be required to accumulate the layers? The time never existed. The polystrate fossils 'tie the layers together' into one, relatively short time period."



Polystrate fossil Ichthyosaur head found vertically embedded in three rock layers. Head is 37cm long. Little time passed while the layers were deposited. Note 1.

5: <u>Fossil Graveyards</u>

"One of the most productive sites for finding large dinosaur fossils in the world is in a rock layer called the Jurassic Morrison Formation in the United States. It contains a large number of bones from dinosaurs and other animals. Furthermore, some of the fossils found in the formation lived in water. Here's a picture of a small part of it. What do you think?"

"It looks like a jumbled mess!" observed Xiao Li.

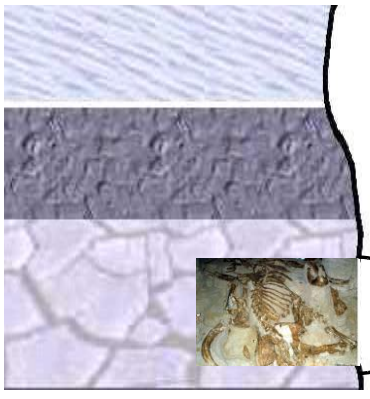
Xiao Wang was more thoughtful and noted: "But some of the bones are still in order together, like that spinal column."

Professor Ho nodded encouragingly. "You're both quite right! As you can see in the picture, the bones are jumbled together, but some of them are articulated, that is, the skeleton is still in order. The jumbled nature of many of the fossils, as well as the presence of fossil clams, snails and logs mixed in with the deposit, makes it virtually certain that they were washed into place during a flood."[24]

A mixture of dinosaur and possibly other animal fossils from the Morrison Formation in the United States. Little time passed while these fossils were being deposited. Note 1.

"You mean Noah's flood?" asked Xiao Li.

"Probably some event associated with it, yes. But that's not what I want to point out here. This deposit is a sandstone inclusion about 15 meters thick within the



Little time passed while the part of the rock layer which has overlapping bones was being deposited.

larger 'Morrison Formation' rock layer. The overlapping jumble of the fossils shows that they were all washed into place at the same time. The fact that the dinosaur bones were not eaten by scavengers and did not rot away shows that they were quickly covered. It seems unquestionable that not much time passed to accumulate the 'fossil graveyard' shown in the picture. Furthermore, the clearly catastrophic flood conditions which laid down the sediments would have been a unique and short-lived phenomenon."[J]

How long does it take to make a fossil?

Four fossilized human artifacts. **Top L:** pickax in rock. **Top R:** clock encased in rock. **Bottom L:** toy car in sandstone. **Bottom R:** fossilized hat. Little time passed while these modern objects were being fossilized. Note 1.

"But doesn't it take a long time for a fossil to form and for sediments to turn to stone?" Xiao Wang asked.

"Just the opposite," replied Professor Ho. "Any organism which is successfully fossilized has to be covered and sealed off quickly, or it will simply rot away. It does not take long to make a fossil, and it does not take long to form rock. You already knew rock could form fast, because you've seen cement harden in a couple of days. What matters is the presence of a chemical which will act as a 'cement' and, to some extent, the compacting of the sediments. That's why we have examples of human artifacts fossilized by either being encased in rock or by actually being turned to stone—impregnated with rock chemicals.

There are also some marvelous examples of animals quickly fossilized. In the Ediacarian fossils, for example, millions of jellyfish were covered in sediment and their impressions recorded in rock within 24 hours. And there are the well-known examples of fish fossilized the midst of swallowing other fish. It doesn't take long to make a fossil!

Fish fossilized while swallowing another fish. Fossilized quickly! Note 1.

Xiao Wang had an objection. "Just because there was a flood somewhere that quickly laid down and fossilized bones doesn't mean that they're not very old."

"Quite so," agree Professor Ho. "My point here is that the long time periods claimed by evolutionary geologists certainly didn't go into accumulating the sedimentary rock layers—at least not the ones with tree trunks and dinosaur bones! Those *had* to have formed quickly. Since those rocks were formed quickly, why should I believe that similar layers which don't happen to have such fossils were formed slowly?"

Map of Morrison Formation. Note 1.

Xiao Wang pondered silently for a moment. "How do you know the rapid accumulation wasn't just a local occurrence at the site where those dinosaur fossils were found?" he asked at last.

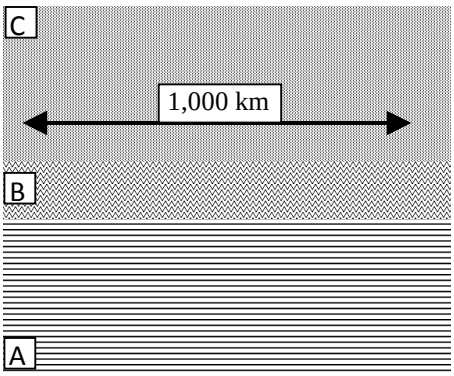
6: Widespread Layers

"An excellent question!" agreed Professor Ho. "I remember asking myself the same thing the first time I learned about polystrate fossils and fossil graveyards. The answer is that these rock layers we're talking about aren't simply local occurrences. The Morrison Formation itself extends over more than one million square kilometers, stretching from Canada all the way to the state of Texas in the U.S.—with an average thickness of only a hundred meters! That's an incredibly wide, thin, water laid layer which demands a unique set of circumstances existing all over that area at the same time. It demands a continent-wide flood, which obviously could only have lasted a short time."

Xiao Wang had studied enough geology to have an answer ready at hand. "But I've read that those layers were deposited slowly in shallow seas which covered most of North America for millions of years, or else on huge river flood plains."

Professor Ho nodded slightly, "Mm, yes, so I've heard. Notice, by the way, that those conventional, evolutionary geologists are agreeing that a large part of a continent was under water—a viewpoint that is already very close to the flood geologists. However I

[J] For a thorough discussion of this site by two geologists, see Note 24.



Thin layer B is a widespread and flat turbidite rock layer. It had to have been laid down rapidly by fast moving water under catastrophic conditions such as a flood or underwater earthquake. Depositing it probably required several days at most.

think we can prove that it wasn't shallow, quiet ters, nor gradual river flood plain accumulation, but a violent, catastrophic flood. Obviously the dinosaurs in the picture we just looked at were buried in flood activity which quickly laid down sediment thick enough to entomb them, and the sandstone section in which they were fossilized is up to 15 meters thick.[25] But we might think that was a local occurrence, while deposition elsewhere across those million square lometers proceeded slowly. Can we prove that an entire rock layer was deposited quickly?"

Professor Ho turned and took down yet another volume from his large, tightly packed bookshelves and began flipping through it. "Yes, we can demonstrate it," he asserted. "Ariel Roth is a Ph.D. zoologist with additional training in geology who spent decades studying questions about fossils, evolution and the age of the earth. He eventually headed up a Geoscience Research Institute.[K] He describes the origin of such deposits:

> The widespread nature of special sedimentary deposits with land-derived fossils offers evidence of a kind of catastrophic activity on the continents for which we have no contemporary analogs. An outstanding example is the Triassic fossil-wood bearing Shinarump conglomerate, a member of the Chinle Formation found in the southwestern United States. This conglomerate, which occasionally grades into a coarse sandstone, usually has a thickness of less than 30 meters, but it spreads as an almost continuous unit over nearly 250,000 square kilometers. Conglomerates such as the Shinarump consist of sizable particles requiring considerable energy for transport. It would demand forces different from those with which we are familiar today to spread such an almost-continuous deposit over so wide an area. It is difficult to conceive of such continuity being produced by local sedimentary activities such as those of rivers, as is sometimes postulated. Any ordinary valley, canyon or mountain forming over time would have easily broken the continuity. …other units found in many geological formations present the same evidence. … Such thin, unique, widespread deposits seem more reminiscent of sheetflood (broad, thin expanses of moving water) activity than local sedimentation.[26]

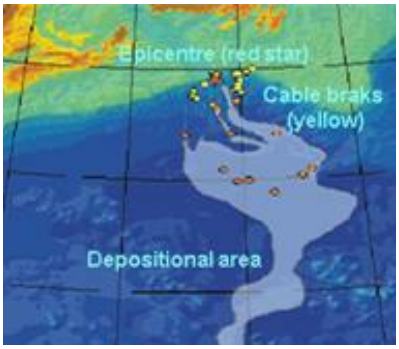
Steven Austin is Ph.D. geologist. He confirms that the source of the Shinarump materials came from far away:

> …the Shinarump Conglomerate…appears to be the erosional remnant of a enormously vast chert pebble and sandstone layer which can be found north, east, south and west of the [Grand] Canyon. The chert pebbles have no source known from the strata beneath…. The pebbles must have been transported by shallow, sheet flooding, from a very distant, exposed source area.[27]

The Shinarump example given by Dr. Roth and Dr. Austin is even better than the Morrison formation. It's incredibly thin: usually less than 30 meters thick; incredibly huge: 250,000 km^2, a little bigger than Guangxi province; it's a continuous unit; and it's made of materials that required fast-moving flood waters to move them. In other words, it was obviously laid down all at the same time by a huge flood![L]

"Layers of sedimentary rock deposited in this way are called turbidities. A good example of a 'small' one occurred

Left: Map of Grand Banks earthquake turbidity deposit on ocean floor. Note 1.



Middle: Turbidity current flowing downhill.

Right: Turbidite rock originally laid under water. Note clear layering despite rapid deposition.

[K] http://www.grisda.org/

[L] For more on this topic, see the excellent series of articles by Ph.D. geologist Andrew Snelling "Six Main Geologic Evidences for the Genesis Flood" at www.answersingenesis.org

in 1929 during the Grand Banks earthquake off the northeast coast of North America. A huge mass of ocean bottom sediments slid down the continental slope and rushed along the ocean bottom at speeds of up to 100km per hour. Parts of the sediments traveled more than 700km, finally forming a layer about a meter deep and 100km^3 in volume. The turbidity got far enough to run into the shipwrecked *Titanic* on the ocean floor.[28] These underwater laid 'trubidite' deposits are now estimated to account for one-third to one-half of all sedimentary rocks on the continents.[29] In other words, those rocks were laid down quickly underwater! This finding, which revolutionized sedimentary geology during the past few decades, fits perfectly with the idea that there was a global flood which quickly deposited most of the earth's fossil bearing sedimentary rock.

"When we realize how many similar examples there are all over the world, we draw two conclusions: there was a huge flood; and we can know for sure that many of the earth's rock layers were deposited quickly. The time that evolutionary geologists claim isn't there!"

Xiao Wang was ready with another objection. "Well, even if some, or even many, of the layers were laid down quickly, in catastrophic floods as you say, a lot of time could have passed *between* the layers."

Professor Ho beamed at him. "That brings us right to one of the strongest evidences that evolutionary time never existed: paraconformities.

7: Paraconformities[30]

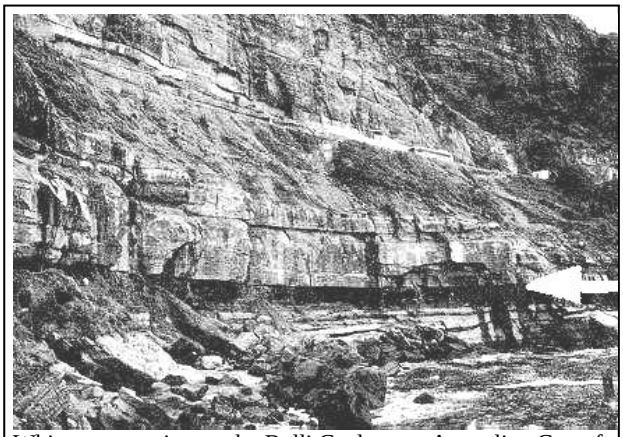
"Paraconformities are evolutionary time gaps between rock layers. These are almost always determined by evolutionary interpretation of fossils. The fossils in the upper layer supposedly appeared on earth millions, tens of millions, or even hundreds of millions of years after the fossils in the lower layer went extinct. So the layers are supposed to have been laid down millions or hundreds of millions of years apart. But they are right on top of each other, in smooth seamless contact, flat layer on flat layer, covering thousands or tens of thousands of square kilometers!"

Grand Canyon, USA. Flat, smooth contact between Coconino Sandstone (above) and Hermit Shale (below). Elsewhere these layers are separated by another rock formation which is as much as 600m thick. Gap said to be about 10 million years. Note 1.

Xiao Wang was unimpressed. "What's the problem with that?"

"The problem is: erosion. There's no sign of any erosion at the contact. The lower, supposedly much older member, is perfectly smooth. It's not covered by any other layers. And if it had been exposed on the surface for any length of time—remember, this is supposed to be millions of years—even the hardest rock would have had substantial erosion.

"Look at this picture. It's from the Grand Canyon in the USA. How much time do you think passed between the deposition of the upper layer and the lower layer? The contact is perfectly flat and smooth. But layers intervene elsewhere which evolutionary geologists estimate would have taken 10 million years to accumulate.[31] If 10 million years passed between the deposition of the upper and lower layers, why is the lower layer perfectly flat and smooth in most places? It would have been deeply marked and broken up by river channels, valleys and canyons—but there is virtually *no* sign of erosion! And the evolutionists say that during that particular (imaginary!) ten million years, the earth had 'an tended period of wet climate.'[32] There is no evidence of that time having passed and no reason to believe it ever existed. Another gap in the Grand Canyon is even worse: 100 million missing years! Here's Dr. Roth's description:



White arrow points to the Bulli Coal seam, Australia. Gap of 5 million years between coal and overlaying layer. 90,000km^2 (including areas not containing coal). Note 1.

> As we stand on the edge of the Grand Canyon, the extremely parallel appearance of the rock layers immediately impresses us. This phenomenon contrasts rather sharply with the profile of the canyon itself, which illustrates the irregularity of erosion. Why don't we observe similar features at the gaps? Present average rates of erosion are so rapid that the entire geologic column could have been eroded away many times during the long ages postulated for the geologic past. Yet at the 100-plus-million year gap [in the Grand Canyon between the 'Devonian' Temple Butte limestone (above) and the 'Cambrian' Muav limestone (below)] we notice only minor erosion, or the contact sometimes appears smooth, or it is invisible. Referring to one section, [evolutionary] geologist Stanley Beus states: 'Here the unconformity [gap], even though representing more

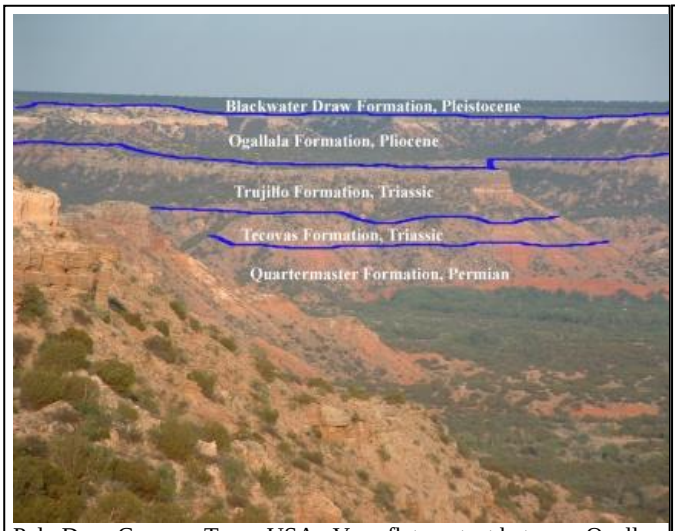
than 100 million years, may be difficult to locate.'[33]

"Here's another example, this time from Australia. A 5 million year gap is supposed to exist between the Bulli Coal seam marked by the white arrow in the picture and the rock layer above it. The gap actually extends much further than the coal seam, covering a total of 90,000km^2. Consider just the area of the gap where the coal is the lower layer. Coal is softer than almost any rock! Is it reasonable to believe it did not erode in five million years? Or if it was protected by a covering layer and then the covering was eroded away, why did erosion stop so neatly right at the soft coal? And how did it produce such a smooth, flat surface? The lack of erosion at flat gaps gives me strong evidence that no significant amount of time passed—despite the claimed dates.

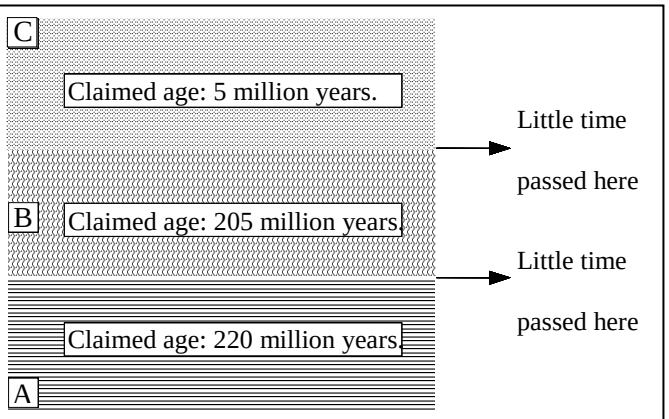
"As Dr. Roth points out:

> As a very minimum, under normal circumstances, we would expect a regional average of more than 100 meters of erosion in only 4 million years [Note: this is based on an erosion rate of less than half the present average worldwide rate.][34]

But the reality is, at many of these gaps, there is *no* evidence for erosion. And examples like this abound—more than you would have the patience to listen to! Read Dr. Roth's book if you want to see more."



Palo Duro Canyon, Texas USA. Very flat contact between Ogallala (above) and Trujillo (Chinle) (below). Gap of 200 million years. Flat contact covers 150,000km^2. Other layers intervene elsewhere. Note 1.



Thin layer C is widespread and flat. It was laid down on top of flat layer B. Not much time could have passed between the depositing of layers B and C, otherwise erosion, uplift, and deposition would have broken up the surface of layer B. But according to evolutionary dating based on the fossils found in layers B and C, 200 million years passed between the deposition of layer B and C. The time is not there!

"I still don't quite see the point of all this about rock layers," said Xiao Li doubtfully.

"Yes, it's a little hard," Professor Ho replied with a sympathetic nod. "Let my try to summarize it for you. We've discussed four common geological features:

1. **Fossil graveyards** where many organisms were washed into place and quickly buried together;
2. **Polystrate fossils** which cut across different layers;
3. **Thin, widespread layers**, many of which are turbidities that must have been laid down under catastrophic conditions;
4. Vast '**paraconformity**' time gaps which supposedly hide millions or even hundreds of millions of years, according to evolutionary fossil dating, but which show little or no sign of passage of time between the lower and upper layers.

Each feature indicates that the vast eons of time normally claimed by evolutionary geologists could not have occurred:

1. **Little time to form a deposit within the layer: Fossil graveyards.** Fossil graveyards show the entire 'graveyard' deposit had to be washed into place and covered in a very short time, probably a few minutes, but, like polystrate fossils, not longer than it would have taken the bodies to rot or be scavenged—probably days or months *at the very most*.

2. **Little time between the layers: Polystrate fossils.** Polystrate fossils linking layers show all the layers involved had to be laid down in less time than it would have taken the fossil to rot away or be eaten by scavengers. For tree trunks, it would be a matter of years or decades at the very most; for animal bodies, more like days or months.

3. **Little time to deposit the entire layer: Thin, widespread layers.** The catastrophic conditions, such as sheet flooding and turbidity currents, required to lay down some thin, widespread rock layers could not have lasted very long—hours or days at the most.

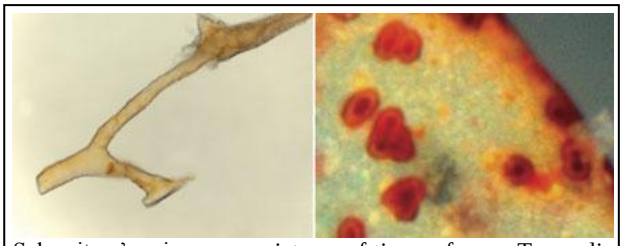
4. **Imagined 'hiatus' time between flat layers did not exist: Paraconformities.** There is simply no reason to believe that millions or tens of millions of years passed between the depositing of

smooth, flat 'paraconformity' layers. The entire exposed surface of the lower layer would have been carved up by erosion in 'only' tens of thousands or hundreds of thousands of years.

When we consider all these factors together, they point to a simple conclusion: millions of years did *not* pass while these rock layers were being formed, no matter what the 'conventional,' evolutionary geologists say. The time is not there!"

Xiao Wang seemed sincerely puzzled. "But if things are as you say, why have scientists overlooked all these facts?"

"It's just another example of what we discussed before. Scientists, like everyone else, work within a paradigm, a preexisting mental framework of presuppositions. This can prevent them from being able see what's right in front of there face. Let me give you another example."



Schweitzer's microscope pictures of tissues from a T. rex dinosaur, supposedly 68 million years old. Left: "flexible branching structures" (blood vessels). Right: Red blood cells, which could squeezed out of the vessels. Note 1.

8: Biological Decay Chronometers

"Here are two pictures of animal tissue taken under a microscope. What do you think these structures are?" Professor Ho asked the boys.

The boys pondered for a moment, then Xiao Wang suggested: "The thing on the left looks like a tube, and the oval shapes on the right might be cells."

"Excellent," Professor Ho affirmed. "The structure on the left is a blood vessel, and the indented, donut shaped structures on the right are red blood cells. Although there was much contention when findings similar to these were first reported, laboratory tests confirmed that they contained components of hemoglobin, a red blood cell protein. It's generally accepted now that these are actual blood vessels and red blood cells."

"But why should there be contention about that?" queried Xiao Wang.

"Because the specimens pictured here, and another set like them, came from the inside of a two dinosaur bones supposedly 65 and 68 million years old."

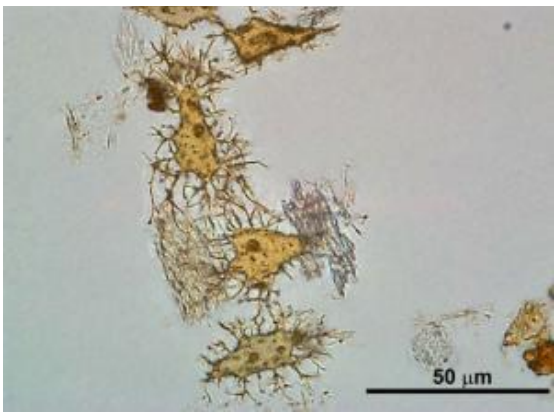
Both boys were silent a moment. Finally Xiao Li asked, "But how could they have lasted so long?"

Professor Ho smiled. "Precisely! They couldn't have. No one believed it at first and the discoverer, Mary Schweitzer, faced considerable criticism and rejection from the evolutionary scientific community. She wasn't surprised at their doubts:

> Schweitzer can understand why so many are skeptical. 'If you take a blood sample, and you stick it on a shelf, you have nothing recognizable in about a week,' she says, adding, 'So why would there be anything left in dinosaurs?'
>
> …Schweitzer says of the moment she found dinosaur red blood cells in the 1990s: 'I just got goose bumps, because everyone knows these things don't last for 65 million years.'[35]

Note that Dr. Schweitzer initially did not believe the red blood cells could last 65 million years—and she was right! But she soon changed her mind because of her evolutionary presuppositions."

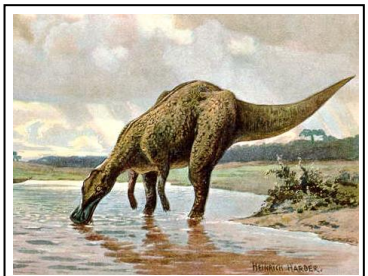
Professor Ho furrowed his brow, looking at them earnestly. "Don't miss the significance of this. Blood vessels and cells in a dinosaur bone means it's nowhere near 65 million years old. The decay rate of cells and biochemicals is a way to measure time, a kind of natural clock. Once an organism dies, these things begin decaying due to natural, inevitable chemical processes—processes which will take place even when the tissue is locked up inside a rock. Laboratory experiments have consistently shown that even under ideal circumstances biological molecules would break apart in far, far less than 65 million years!"



Schweitzer's microscope picture of Hadrosaur ('duck-billed') dinosaur osteocytes (bone building cells). Supposedly 80 million years old. Note 1.

Professor Ho continued with a shake of his head. "Forget about entire red blood cells. Not even the molecular subcomponents should last that long! Take for example collagen, a soft, flexible protein which is an important component of bone. After finding soft tissue in two T. rex's, Schweitzer went on to find indisputable collagen protein in another dinosaur, a hadrosaur supposedly 80 million years old. She also found exquisitely preserved osteocytes, the cells that build up bones. She admitted that she had never expected to find proteins in such an 'old' specimen:

> The presence of original molecular components is not predicted for fossils older than a million years…[36]



Artist's conception of a hadrosaur ('duck-billed') dinosaur. Note 1.

Damaged DNA in chromosomes. Arrows point to damaged locations. Note 1.

But when her findings were repeated and confirmed, she and her evolutionary leagues simply ignored all the chemistry findings and insisted that these delicate biochemicals could indeed last 80 million years. They never once stopped to ask whether the bones were really that old!

"You need to understand that *before* Schweitzer found dinosaur tissues, research had already been done on the expected longevity of specific biological molecules. Based on laboratory studies of decay rates, even at a steady temperature of 0ºC, collagen proteins were not expected to be detectable after more than 2.7 million years. At a mere 20ºC, they would be gone in 15,000 years.[37] Those were the calculations made by mainstream scientists, believers in evolution. They used ideal laboratory conditions to find the maximum time limits that these biological molecules could last. The fact that we still find them in dinosaur bones buried where the temperature is frequently above freezing tells us that the bones simply *aren't* 65 or more million years old. The time isn't there!

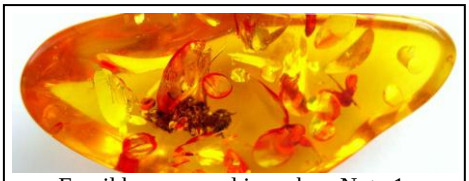
"Let me give you another example of a biological decay clock: the decay rate of DNA molecules. I mentioned above that the bone protein collagen would break down in less than 3 million years. DNA is even less stable; even at 0ºC it should be unrecoverable after 125,000 years.[38] The observed rate of DNA degradation in Egyptian mummies of known ages is comparable, with a half-life of 562 years[39] and thus nothing recoverable after less than 100,000 years have passed.

"In addition to the inevitable chemical breakdown, DNA in fossil cells also faces the earth's background radiation. Background radiation comes from the decay of radioactive materials scattered throughout the earth's rock layers. It's intensity varies from place to place, but it is a universal phenomenon everywhere on earth. When this radiation strikes DNA molecules it causes what is called cross-linking, in a sense 'welding' different pieces of DNA together and ruining them. In a living cell, DNA repair mechanisms can usually keep up with the damage, but in a dead cell the damage simply accumulates.[40,41] Even if you sealed a fossil in a vacuum tube at a super-low low temperature, cross-linking caused by radiation alone would mutilate DNA beyond recovery of any information in a couple of million years—probably much less than that. Of course, any possibility of reviving life function would have been destroyed much earlier. The decay rate of DNA is a kind of alarm clock, and it rings long before a million years have passed to say: 'Time's up! No more molecules!'

DNA was recovered from a fossil magnolia leaf like this one supposedly 17-20 million years old. Note 1.

"Nonetheless, scientists have been publishing research for decades claiming to have extracted portions of DNA from fossils 17 to 225 million years old.[42] For example, DNA has been recovered from a bee encased in amber, supposedly 25-40 million years old, and a weevil, also preserved in amber, supposedly 120 million years or more old. It simply shouldn't be possible to recover DNA from such 'old' specimens; background radiation alone would have destroyed it long ago. So the evolutionists argue among themselves: some claim contamination, others defend their results. But none of them reach the correct conclusion: *the time simply isn't there*. The DNA found is probably real, but it's not millions of years old!

"Even more astonishing, from the 1960s onward there have been claims of reviving bacteria found in sediments dated up 250 million years[43,44] or even 650 million years[45] old. These were extracted from salt deposits and other sources. Extremely rigorous controls were exercised to avoid contamination and the experiments were run repeatedly—with the same results. But the critics cannot believe the bacteria's DNA and other parts could be intact after so long, so these studies are still usually dismissed as contamination—even when the odds against contamination are claimed to be a billion to one.[46]



Fossil bee encased in amber. Note 1.

"In reality, probably both sides in the argument are right. The revivers are right that the bacteria they find are not due to modern contamination, and the critics are right that DNA could not last that long. The answer is: those fossil bacteria aren't millions of years old, and neither are the rocks they were taken from. But no one every considers that possibility."

"Can it really be as bad as that?" Xiao Li asked. "Do scientists really not think about the possibility that the earth is young?"

Professor Ho shook his head sadly. "No, not even when the evidence is right in front of them. That might be why they never found dinosaur red blood cells before. The initial discovery Schweitzer made was done casually with an ordinary light microscope when she happened to be in Horner's lab. Since then she has found other examples of soft tissue preserved in at least two other dinosaurs. It can't be too extremely uncommon. How is it that over a hundred years of paleontological work no one every reported such a thing before? Because of their long ages bias, they weren't looking for it. The paleontologist who discovered the dinosaur bone where red blood cells were first found had been smelling rotting soft tissue for years, but never stopped to think about it:

> Schweitzer recounts how, after that first discovery, she noticed that a T. rex skeleton (from Hell Creek, Montana) had a distinctly cadaverous odor. When she mentioned this to long-time paleontologist Jack Horner, he said 'Oh yeah, all Hell Creek bones smell.'
>
> Astonishing, isn't it? So ingrained is the notion among paleontologists that dinosaur bones must be millions

Salamander fossil found in 2009 near Castellon, Spain. Supposedly 18 million years old. Contained desiccated muscle, complete with blood-filled vessels—muscle was *not* mineralized / lithified. Note 1.

of years old that the 'smell of death' didn't even ter with them—despite the evidence being right under their noses.[47]

The smell of decay should have told the paleontologists that there was soft tissue in the bones which began to rot as soon as it was dug up and exposed to air and bacteria. But they didn't notice because they were blinded by their presuppositions."

"But," Xiao Li objected, "don't the mainstream evolutionist scientists know about the creationists who say the earth is young?"

"Oh yes, they all know," Professor Ho assured him. "They openly despise and ridicule the creationists."

"But don't they see how finding blood vessels and cells and proteins in a dinosaur supports the creationist position?"

Professor Ho pursed his lips and nodded. "Yes, they see it all right! Dr. Horner, who found the dinosaurs Dr. Schweitzer worked on, records this conversation:

> When Mary [Schweitzer] was first working on this [hadrosaur] material, she called me up to say she had found osteocytes. I assumed she meant the spaces where the osteocytes would have been, which is what I suggested.
>
> 'No, Jack, actually we have the cells and they have filipodia and they have nuclei.'
>
> 'Mary, the freaking creationists are just going to love you.'
>
> 'Jack, it's your dinosaur.'[48]

Dr. 'Jack' Horner was right: we creationists do recognize and accept the significance of Dr. Schweitzer's findings. Flexible blood vessels, red blood cells and osteocytes, intact proteins: they mean that the dinosaur bones are young—and so is the rock they were buried in!"

9: Genetic Decay

"It's not only red blood cells in dinosaur bones and DNA in fossil leaves that are decaying. The genes in your body are decaying while you're still alive. Your cells are slowly accumulating mutations. Some of those happen in the reproductive cells of your body and are inherited by the next generation. On average, at least one hundred new single nucleotide 'point mutations' are passed on to each new generation, and probably several times that many.[49] This process occurs in every individual and works to degrade the entire collective genome of the human race. The process is so fast that's it's impossible for the human race to have existed for a million years."

"But doesn't natural selection weed out the bad mutations?" Xiao Wang asked.

"Only when they're very severe, bad enough to cause death or impede reproduction," replied Professor Ho. "But the majority of mutations are 'near-neutrals,' recessive and 'silent.' They mix up the information in the genome a little bit, but not enough to significantly impact the individual's chance of leaving offspring."

"Then why do they matter?"

"The problem is, these 'near-neutral' mutations accumulate in the genome of a population, such as the human race. Slowly they reach a level which degrades the fitness of the entire population. Eventually every individual will have too many mistakes in their genes, and these will drag down the entire population.

"It's sort of like repeatedly making photocopies of an instructions manual. When you make a copy of a copy of a copy, the letters gradually become less and less distinct. If the copying process continues, after awhile, you can't make out some of the words. You lose some of the meaning. Eventually, you can't understand entire sentences. By the end, nothing can be read clearly. Long before the end, the instructions manual is useless. It's lost too much information to be functional.

"That's what is happening with the human genome. Information is slowly being lost. Eventually, so much will be lost that function will be impaired. Average fertility and life expectancy will decline, and the species will dwindle to extinction.

"You can see proof of the process when human beings intermarry too closely. Since human genes are paired, in most cases, even if a mutated nucleotide is in a vital area which would affect a person's development, it is offset by a healthy, unmutated gene inherited from the other parent. But if brothers and sisters or first cousins marry, their recessive mutations will frequently match up and cause functional problems. Thus the offspring of first cousin marriages have a lower life expectancy than the general population. In those close kin marriages, you can immediately see the impact of accumulated genetic mistakes. But as time goes on, a similar effect will occur throughout the entire human race, because the total number of mutations is increasing with each generation."

Professor Ho turned to his bookshelves and pulled down another volume. "Dr. John C. Sanford is a plant geneticist and former university professor who received and believed the usual indoctrination in evolution during his scientific training. He was an atheist, but later he became a theist and then a Christian. He reexamined the possibility of evolving the human genome through random mutations. What he discovered is, we're actually being driven toward extinction by accumulating mutations.

If the genome is degrading, then our species is not evolving, but is essentially "aging." There appears to be a

> close parallel between the aging of a species and the aging of an individual. Both seem to involve the progressive accumulation of mutations. … …when first cousins marry, their children have a serious reduction of life expectancy. Why is this? It is because inbreeding exposes the genetic mistakes within the genome (recessive mutations) that have not yet had time to "come to the surface." Inbreeding is like a sneak-preview of where we are going genetically as a species. The reduced life expectancy of inbred children reflects the overall aging of the genome, and reveals the hidden reservoir of genetic damage (recessive mutation) that has been accumulating.[50]

"But aren't at least some of those mutations beneficial?" countered Xiao Wang. "Maybe the good ones are kept and outweigh the bad ones."

Professor Ho shook his head firmly. "A very small proportion of mutations may be 'beneficial' in certain circumstances. I don't mean that they are actually creating novel functional structures; you couldn't even hope to get a specified novel protein in a billion years, and a new 'random' protein would only gum up the works [see chapter 1]. But if there are rare mutations that somehow have a net beneficial effect on your survival, they can't stop the overall process of decay:

> Since we know that the bad mutations overwhelmingly outnumber the good, we can be certain that any stretch of DNA must degenerate. The hordes of bad mutations will always drag the rare good mutations down with them. While we are waiting for a rare beneficial mutation, bad mutations are piling up throughout the region. … Time is our enemy in this situation. The more time, the less information.[51]

The bottom line is, since God cursed the earth, we've been headed for extinction. The question is, how fast? If the rate of accumulation of mutations were only 100 per generation—and it's almost certainly higher than that, probably ten times higher—a million years at 25 years per generation would have generated 4,000,000 mutations in the average person's genome.[M] Long before you got to 4,000,000, the race would have gone extinct in what geneticists refer to a mutational meltdown. In short, the life on earth can't be nearly as old as the evolutionists claim."

Radiometric Dating

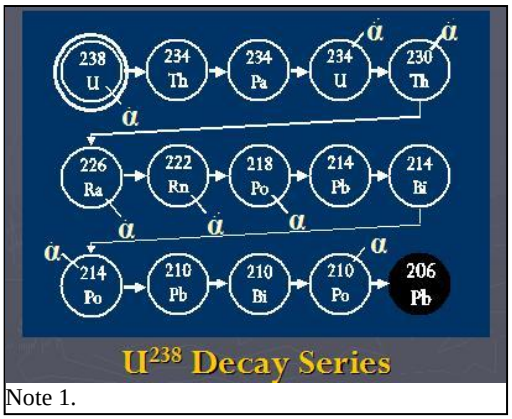
"But what about the radioactivity dates?" asked Xiao Wang. "I've read that scientists use them to accurately date fossils millions or even hundreds of millions of years old."

Professor Ho nodded vigorously in his characteristic way. "Yes! We've read about those dates everywhere. For a long time it bothered me greatly. All the scientists seem to agree about them. So I did a long and careful study of radiometric dating."

"What did you conclude?"

"On the one hand, these dating methods are still an unsolved problem for young earth creationism," Professor Ho admitted with a slight frown. "On the other hand, they are generally unreliable and frequently produce contradictory and inaccurate results. They simply are not enough reason to set aside all the other, much younger age indicators we just discussed.

"First note that radiometric dating methods can only be used for volcanic rocks which were thoroughly melted. These were too hot to preserve fossils. Radiometrics are never used to directly date sedimentary, fossil containing rocks—or a least they never should be! Sedimentary rocks are a mix of eroded sediments and absolutely cannot be reliably dated by radiometrics, not even in theory. When they tell you some fossil layer has been dated so many million years old by radiometrics, what they're really dating is some volcanic layer above or below it."



Note 1.

"What about carbon-14 dating of bones?" Xiao Li asked.

"That's a special case with a very limited range of application," Professor Ho replied. "We'll talk about it in a moment.

"Let's review the theory of radiometric dating. Certain radioactive elements called 'parent' elements, for example uranium-238, gradually decay into other elements by giving off subatomic particles, in this case the α (alpha particle) shown in the diagram. This process ends in a stable 'daughter' element, in this case Lead-206. The rate at which this occurs can be measured in the laboratory across a very small span of time and then extrapolated to longer time periods. The length of time it would take half of a given amount of parent element to decay into the daughter element is called the half life. Uranium-238 is calculated to have a half life of about 4.5 billion years, so if you started with one gram of uranium-238, theoretically after 4.5 billion years you would have half a gram left, along with a specific amount of lead-206. The ratio between uranium-238 and lead-206 should change in a predicable way over time, so in theory you could calculate the time when a rock formed by comparing the

[M] This does not contradict chapter 2's discussion of the impossibility of getting an average of 40 million differences between chimpanzee and human genomes in 6 million years. Most of those 40 million differences would have be the same in *all* members of the chimp and human populations. In contrast, the hypothetical 4 million accumulated mutations would be very different in different individuals.

amounts of uranium-238 (the 'parent') and lead-206 (the 'daughter)."

Professor Ho smiled. "Like so many things in life, there's a big difference between the 'neat and sweet' theory and the actual, messy practice! Radiometric dating requires three huge assumptions to be true before it can give accurate dates:

1. The rock must have been a 'closed system' throughout it's history. No parent or daughter elements (including elements in the middle of the decay chain) may have been added to or removed from the rock.
2. The initial conditions must be known. It must be certain that there were *no* daughter elements in the rock when it was formed. Alternately, the initial ratio of parent and daughter elements must be known with certainty.
3. The radioactive decay rate must have been constant throughout the rock's history.

In reality, the first two assumptions are known to be frequently wrong for actual rocks tested. The third assumption is being called into question by creation scientists, and even a few non-creationists."

Unreliable assumption 1: The rocks are closed systems

"You need to understand first that many radiometric dates calculated in the laboratories are rejected by mainstream, evolutionary geologists—usually without ever being published. When these are rejected, it is often assumed that there was some kind of contamination in the rock's history, some kind of movement in or out of parent or daughter products. For example, if the parent::daughter ratio yields a date judged too 'old,' it might be asserted that some daughter product has moved into the rock due to ground water flow through the rock. If the ratio gives a date that is too 'young,' it could be claimed that daughter product has moved out of the rock due to a 'reheating' episode long after the rock was formed."

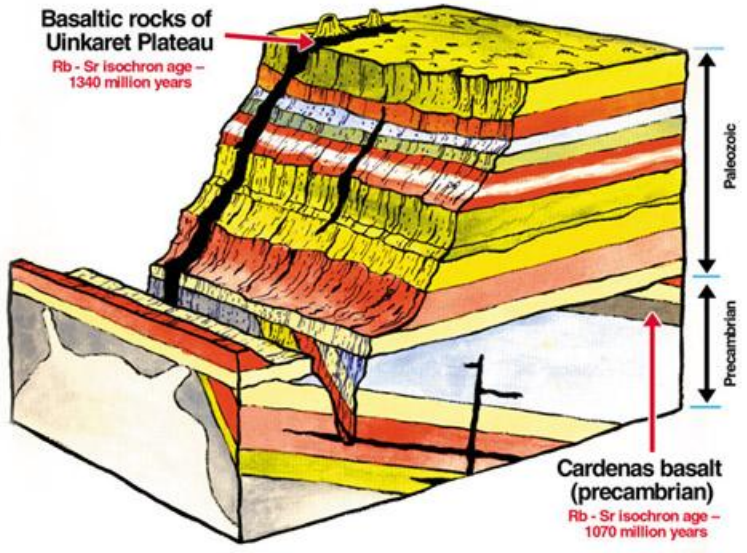
"How do they know a rock is too 'old' or too 'young' " asked Xiao Wang.

"Usually it's based on the fossils found in layers above or below. Those have already been assigned dates—dates assigned at least in part based on a dating framework in place before radioactivity was even discovered. A fossil date will *always* trump a radiometric date. They call it 'fossil control.'

"Of course, geologists are careful to try to avoid rocks which look like they may have been contaminated by addition or subtraction of parent or daughter elements. But all geologists would agree that this kind of contamination occurs in rocks where it cannot be detected by any kind of physical examination. The fact is, virtually all rocks, even hard ones, are open systems where elements can and do pass in and out.

"That brings me to my first specific example of the essential unreliability of radiometric dating. We've talked about the Grand Canyon in the U.S. Most of the layers are sedimentary, so there are very few rock layers in it which can be dated by radiometrics. Two layers which can be dated occur at the top and the bottom. Both are basalts, hardened volcanic lava. The top layer, the Uinkaret Plateau, includes lava flows that poured down the face of the canyon after it was eroded. It's obviously comparatively recent! Even evolutionary geologists agree with that, placing the upper layers of the Plateau within the last few million years. Meanwhile, the lower layer, the Cardenas basalt, is supposed to be close to a billion years old. What results have radiometric dating yielded?

"Notice that different methods and elements were used, including some of the currently favored ones. For the upper layer, radiometric dates ranged from 10,000 years to 2.6 *billion* years. Almost all of those dates were worthless, as even the evolutionist geologists would agree. In reality, the only one that's even close is the 10,000 year date, though evolutionists would probably accept



Grand Canyon volcanic layers dated by radiometrics. Note 1.

Uinkaret Plateau Basalt (top of canyon)	
Six potassium-argon (K-Ar) model ages:	10,000 years; 1.2, 2.6, 3.6, 2.6, and 117.0 million years
Five rubidium-strontium (Rb-Sr) model ages:	1,270 to 1,390 million
One rubidium-strontium (Rb-Sr) isochron age:	1,340 million
One lead-lead (Pb-Pb) isochron age:	2,600 million

Cardenas Basalt (bottom of canyon)	
Five potassium-argon (K-Ar) model ages:	791 to 853 million
Six rubidium-strontium (Rb-Sr) model ages:	980 to 1,100 million
One potassium-argon (K-Ar) isochron age:	715 million
One rubidium-strontium (Rb-Sr) isochron age:	1,070 million

Radiometric dating results for Grand Canyon. See Note 27, Pg. 120-28. (Later radiometric dating of the Cardenas Basalt (bottom of canyon) samples collected by creationist scientists produced an even wider range, from 516—1,588 million years. The radiometric analysis was done by a conventional evolutionary geology laboratory. See Note 10 Pg. 57.)

the several million year dates for parts of the plateau. But all of the rest of the dates, carefully calculated by the usual technical means, are simply dismissed out of hand. If many dates are found to be wrong when we *can* check them against something else, why should we believe them when we *can't* check them?

"Meanwhile, the spread for the lower layer covers 400 million (imaginary!) years, from 715 to 1,100 million years. The lower dates were generally considered unacceptable because they did not leave enough time for certain layers above the Cardenas Basalt. So the currently accepted date is fixed at over a billion years—for the moment. When I casually checked online today, one source gave the whole range and called it uncertain, while another confidently proclaimed 1,100 million years as the scientifically determined date.

"Note especially that the Rb-Sr method finally *chosen* to date the lower layer—Rb-Sr isochron (1,070 million) and *some* of the Rb-Sr model ages (1,100 million)—is the same method which is *rejected* for the upper layer. At the same time, the only method producing any acceptable results for the upper layer—*some* of the K-Ar model ages (10,000, etc.)—is the same method which is generally *rejected* for the lower layer.

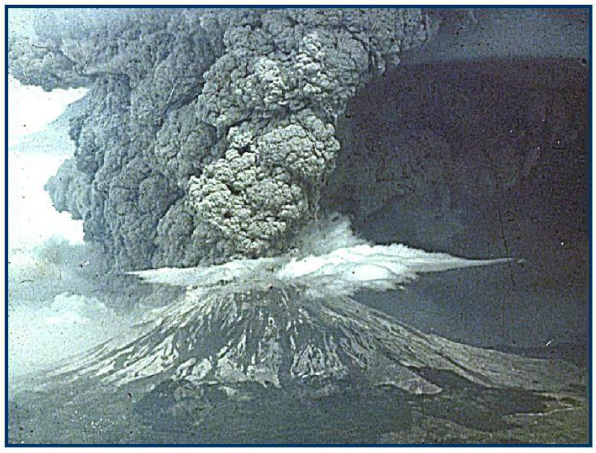
"What actual basis did they have for choosing the Rb-Sr date as correct for the lower layer? It fit their preconceived expectations! So open system behavior, specifically a 'reheating' event which would have removed Ar and changed the K-Ar ratio, was invented to explain away the unacceptable K-Ar date. Meanwhile, for the upper layer, the Rb-Sr was unacceptable, but *some* of the K-Ar dates was allowable—so they were chosen. All this with no experimental basis whatsoever, simply to force the layers' ages to conform to the pre-existing framework!"

Unreliable assumption 2: No 'daughter' elements when rock was formed

Professor Ho was beginning to get excited, even angry. "Do you understand what this means? For years I worried myself over the radiometric dates. It was one of the last great barriers standing between me and being able to believe the Bible's history. But the 'scientists' themselves treat these dates completely casually if they give a result which doesn't fit with their pre-existing evolutionary faith!"

Xiao Wang was a little taken aback by Professor Ho's passion and it showed on his face.

Professor Ho made an effort to calm down. "You might think," he continued, "that such findings are exceptional. They actually not rare, but most discrepancies are never published, so we really can't get an accurate feel for how often dates are rejected.[52]



Mount St. Helens erupting in 1980. Eleven years later, the fresh lava dome was dated by radiometrics as 340,000 to 2.8 million years old. Note 1.

"Where can we get an objective test of these methods? The best one I know of is testing historical lava flows of known dates by radiometrics. Mount St. Helens erupted in the state of Washington, U.S.A. in 1980. Between 1980 and 1986 a 250 meter high lava dome formed within the crater. In 1991, creationist geologists gathered a sample of this five year old rock and sent it to a conventional, evolutionary geology laboratory for radiometric analysis. They did not tell them where it was taken from. The results came back with dates ranging from 340,000 ±60,000 years old to 2.8 ±0.6 million years old.[53] Drs. Austin and Snelling, both Ph.D. geologists, note:

> Because potassium decays into argon very slowly, the rocks formed in and subsequent to the 1980 eruption at Mount St. Helens should date "too young to measure." Almost no "daughter" argon should be present.
>
> Samples gathered have now been dated using the potassium-argon method. According to radioisotope dating, certain minerals in the lava dome are up to 2.4 million years old. All of the minerals combined yield the date of 350,000 years by the potassium-argon technique. However, we know that these minerals and the rocks that contain them cooled within lava between the years 1980 and 1986. This situation is not unique. Nearly every time a rock of known age has been dated by radioisotope dating, the calculated age is similarly exaggerated. Should we trust these methods to date rocks of unknown age?[54]

It's obvious that at Mount St. Helens, the rock, even though heated into a molten state, didn't lose all of it's argon. The new rock 'inherited' argon from it's magma, or perhaps from the air. It has lots of argon that is *not* the result of radioactive decay. In other words the second assumption of radiometric dating, that the molten lava did not have any 'daughter' product when it first cooled, is shown here to be false. But if we didn't already *know* the lava is recent, how would we ever guess that the argon was inherited? We would probably just accept the radiometric dates and assume it was at least hundreds of thousands of years old!

"This is not an exceptional case. Here is a very partial, very selective list of historical volcanic eruptions with contradictory radiometric dates.[55] Dozens more examples could be given. It *often* happens that lavas retain argon when they cool."

"But is do *all* recent lavas produce 'old' radiometric dates?"

"No, not all. But if the method is reliable, why do so many of them give wrong dates? And remember, these are

relatively recent eruptions. As time passes, there will be more and more opportunities for parent or daughter products to move in or out of a rock. More time will make the method *less* accurate, not more accurate. Finally, I ask you again: Since the method is wrong so often when I *can* test it, why on earth should I trust it when I *can't* test it?"

Questionable assumption 3: Has the rate of radioactive decay ever been faster in the past?

"I don't trust the method," Professor Ho continued, "but I confess that radiometrics are still a problem for creationists. It appears that there *is* a correlation between how deep a layer is and how 'old' it appears on radiometric dating. It might be caused by the way radioactive elements and daughter products mixed as they were rising from within the earth; in other words, the solution which explains radiometrics might be geochemical and have to do with the first and second assumptions being wrong. But I admit it would still be difficult to explain all the radiometric decay which seems to have taken place. To solve that, the best minds in creation science are presently mounting a challenge to the third assumption: that the rate of radioactive decay has never changed.

"This topic is so complex that we can't go into it much today. If you're interested, you can consult the latest research.[N] But I will mention that there is no absolute theoretical reason why radioactive decay could not have been much faster in the past, or have been temporarily accelerated by events like magnetic star gamma ray bursts, or by it's very nature not be regular over long periods.[56] If any of these turn out to be correct, they would create the false appearance of 'old' radiometric dates. But at present we don't have strong evidence to support these; they are just avenues for future research."

Calibration: What was radiometric dating checked against?

"I have a final reason why I reject radiometric dating: it has never been calibrated against anything else reliable. When you have a watch, you have to 'calibrate it,' that is, set your watch against something else you believe is accurate. When the first radiometric dates came out about a hundred years ago, they were calibrated against 19th century sedimentation studies. That was in the days before turbidities were discovered—and while polystrate fossils were still being diligently ignored! Geologists assumed that thick sedimentary layers had, for the most part, been built up gradually at rates of a few centimeters or even millimeters every century. Using these ideas, and estimates for the maximum combined thickness of sedimentary layers, geologists came up with a date of about 600 million years for the beginning of the 'Cambrian' layers. That's the layer where it was thought fossils bigger than microscopic size first appeared.[O]

"That date, 600 million years, was proposed by one well known geologist in 1893. Others proposed dates ranged around it.[57] 600 million years is very close to the presently accepted date for the beginning of the Cambrian. Now here's the punch line: *absolutely no one*, creationist or evolutionist, would accept the sedimentation studies anymore. No one would accept the methods that produced that 600 million year date! As we saw above with turbidities, sedimentation is often catastrophic and it is now universally agreed that the rate is highly variable over time. You can't just measure the thickness of a layer and calculate how many years it took to accumulate—which is exactly what they did in the 19th century.

"Radioactivity was discovered in 1896. When radiometric dates began to appear in the early 20th century, what did they check them against? Take a guess!"

"The sedimentation study dates!" exclaimed Xiao Li with a triumphant smile.

"Precisely! And guess what? The radiometric dates agreed with the sedimentation study dates! As far as I know, that's the only thing the radiometric dates were calibrated against for decades, until the radiometrics themselves became the standard—and the no longer accepted sedimentation studies were quietly retired. This is what is called a 'tracking effect' in science: the tendency to make sure your results agree with the preexisting, generally accepted results.[58] But why should we trust radiometric dates which were originally calibrated and checked against sedimentation, a dating method now universally known to wrong?"

Carbon-14 dating: Not a problem for creationism

After a brief silence, Xiao Li asked, "Professor Ho, what about carbon-14? You said you'd explain it."

"Yes, of course! Carbon-14 is not a problem for creationism. First of all, even in theory, it could only date items back to about a couple of hundred thou-

Location	Date	Radiometric results	Minimum Radiometric "Age"
Kilauea Iki basalt, Hawaii	1959	8.5±6.8 million	1.7 million
Mt. Stromboli, Italy, volcanic bomb	Sep. 23, 1963	2.4±2 million	2.2 million
Mt. Etna basalt, Sicily	May 1964	0.7±0.01 million	600,000
Medicine Lake Highlands obsidian, Glass Mountains, California	<500 years old	12.6±4.5 million	8.1 million
Hualalai basalt, Hawaii	1800-1801	22.8±16.5 million	6.3 million
Anorthoclase in volcanic bomb, Mt Erebus, Antarctica	1984	0.64±0.03 million	610,000
Kilauea basalt, Hawaii	<200 years old	21±8 million	13 million
Kilauea basalt, Hawaii	<1,000 years old	42.9±4.2 million; 30.3±3.3 million	38.7 million; 27 million

Some historical volcanic eruptions and their radiometric dates. From Note 55.

[N] Two major works, both *very* technical, report work done through 2005: Vardiman, Larry, Andrew A. Snelling and Eugene F. Chaffin, Eds. Radioisotopes and the Age of the Earth, Volume I and Volume II. Institute for Creation Research, January 2000 and January 2005.

[O] Fossils of larger sizes have now been found in some 'Precambrian' layers.

sand years. In reality, however, it's only used back to an assumed 50,000 or so years ago. Also note that it can only be used on things which were once living. Here's how one creation scientist explains it:

> Carbon-14 dates are determined from the measured ratio of radioactive carbon-14 to normal carbon-12 ($^{14}C/^{12}C$). Used on samples which were once alive, such as wood or bone, the measured $^{14}C/^{12}C$ ratio is compared with the ratio in living things today. …
>
> Wrong dates are usually caused by assuming a wrong initial $^{14}C/^{12}C$ ratio, contamination [addition of carbon] or leaching [removal of carbon]. Samples from before the Flood, or from the early post-Flood period, give ages that are too old by tens of thousands of years. This is because the Flood buried lots of ^{12}C-rich plants and animals. This would result in a lower $^{14}C/^{12}C$ ratio, which is wrongly interpreted as great age.[59]

"Carbon-14 dating depends on the ratio of radioactive carbon-14 and non-radioactive carbon-12 in the atmosphere. So the key issue is determining what the carbon-12 / carbon-14 ratio was in the past. Then you can adjust or calibrate your carbon-14 dates. Everyone, creationists and evolutionists, agree that carbon-14 dates need to be 'calibrated' that way because the amount of carbon-14 in the atmosphere is known to change due to changes in cosmic radiation from the sun, the earth's magnetic field, volcanic eruptions, climate changes, and other factors. It's also agreed by all that oceans have a major impact on it. The difference is that creationists recognize the impact of the Flood. Here's Dr. Roth's summary:

> The worldwide flood described in Genesis would unquestionably cause a major change in the carbon cycle of our planet. Creationists have generally assumed that a lower concentration of ^{14}C existed in the atmosphere and plants before that flood. Such an assumption agrees with the extremely low proportion of ^{14}C in coal and oil. Creationists then suggest that *gradual* adjustments after the catastrophe have produced a slow increase in ^{14}C. The gradual rise for some 1,000—2,000 years after the flood could produce the older dates and sequences found in lamina and other deposits. Factors proposed by creationists for changes in the concentration of ^{14}C include some of the same explanations used by noncreationists for ^{14}C anomalies. We should make special mention of: (1) a large carbon reservoir diluting ^{14}C before the flood; (2) a stronger magnetic field before the flood, deflecting the cosmic rays that produce the ^{14}C; (3) a rate of mixing of ^{14}C into the oceans after the flood that would affect both atmospheric and oceanic concentrations of ^{14}C; and (4) change in the intensity of the source of cosmic rays that create the ^{14}C. [60]

In simple terms, the Flood model indicates that there would have been less carbon-14 before the Flood and still less immediately after the flood. This would have caused organisms dying then to have less carbon-14 than organisms now do. These would therefore be misdated as very excessively old.

"Carbon-14 is known to frequently give inaccurate results—even dating still living things as thousands of years old:

> …some aquatic mosses now living in Iceland date around 6,000 to 8,000 years by the ^{14}C method. Living snails in Nevada give apparent ages of 27,000 years, and most living marine specimens from the world's oceans date at least several hundred years old. Such examples illustrate what is sometimes called the "reservoir effect," which is probably the most serious problem ^{14}C dating faces. The reason that some living examples have an unreasonable ^{14}C age is that their environment has less than the normal amount of ^{14}C, so they "date" old even before they are dead. Other anomalies probably result from other factors, such as the exchange of ^{14}C atoms with other forms of carbon. For instance, the scalp muscle of a frozen musk ox from Alaska gave a ^{14}C age of 24,140 years, while its hair dated at 17,210 years. Marine shells in Hawaii register younger dates if preserved in volcanic ash instead of limestone.[61]


One of the Lake Mungo fossils. Note 1.

As a result of all these potential sources of error in the method, results are often set aside by evolutionary anthropologists and paleontologists. Let me give you two specific examples among the many, many examples which could be cited. Sometimes carbon-14 dates are set aside by evolutionists in favor of younger dates:

We can illustrate the difficulty of dating in this period by the dating of 11 early North American human skeletons. Early published dates based on several dating methods averaged more than 28,000 years. Reinvestigation produced revised dates that averaged less than 4,000 years, but the revised dates have also been challenged.[62]

"Sometimes carbon-14 dates are rejected in favor of older dates. In 1969, a human fossil known as Lake Mungo Woman was found in Australia. Carbon dating on the fossil's bone apatite (the hard bone material) yielded an age of 19,000 years, while dating the collagen (soft tissue) gave 24,700 years. 5,000 years is a big difference; which date was right? But a piece of charcoal found buried above her gave 26,500 years, so that became the date. Remember, an older fossil is more exciting! Then in 1998 a different dating method (thermoluminescence) was used on the burial site, and the date was revised to 42,000 years old. Even more exciting! Then in 1999, multiple other methods (including another kind of thermoluminescence) were used, resulting in a date of 62,000 years. Still more exciting—but that last date was

disputed, because it would have affected ideas held by other experts about human evolution in other parts of the world.[63]

"What is fascinating here is how easily the earlier carbon-14 dates were set aside in favor of an more 'interesting' older date from another method. Apparently no anthropologist felt the need to defend the validity of carbon-14 dates if they got in the way of a more desirable interpretation! Suddenly the scientists thought it was perfectly reasonable to reject a formerly widely reported and accepted carbon-14 date. No doubt they gave some plausible reason. And things like that happen constantly.

"All of those dates for Mungo Woman are wrong, of course. The carbon-14 dates are off because they aren't calibrated properly and don't take into account the way Noah's Flood affected the carbon in the atmosphere. The other methods, such as thermoluminescence, are not only uncalibrated but based on extremely tenuous assumptions, even worse than the usual radiometrics.

"If evolutionary anthropologists don't believe their own interpretations of carbon-14 numbers, why should I? I know there was a Flood which changed the carbon ratios!"

Carbon-14: Born Again as a young earth creationist?

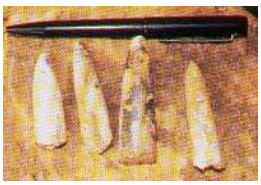
"Actually the situation is far worse than that for the evolutionists." Professor Ho chuckled. "Carbon-14 dating has been 'born again' and is now a young earth creationist!"

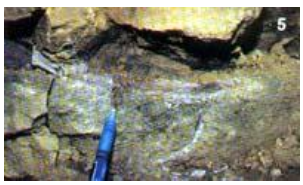
"What do you mean?" asked Xiao Wang.

"Recall that carbon-14's half-life is relatively short—about 5,730 years. That means in much less than one million years, no detectable carbon-14 should remain in any fossilized organism. Therefore evolutionary scientists don't bother dating fossils supposed to tens or hundreds of millions of years old. But the creationists have begun sending such objects to the carbon-14 laboratories for dating. The results were that carbon-14 was consistently found in fossils supposed to be hundreds of millions of years old, including lumps of coal and fossil wood from coal mines.[64] The reported results indicated levels of carbon-14 far above the threshold of experimental detection, far too high to be written off as contamination. A fossilized tree stump from an 'Upper Permian' coal bed supposedly 250 million years old was tested. The bark dated to 33,700 +/- 400 years old. That implies finding more than 1% of the level of carbon-14 in modern organisms—a significant amount for these kinds of tests. Furthermore, the lab reported chemical ratios which were 'consistent with the analyzed carbon in the fossilized tree stump representing organic carbon from wood, not from contamination.'[65]

Fossil tree stump found in a '250 million year old' coal mine. Bark C-14 dated to about 33,700 years. Note 1.

"Remember, the '33,700' year date would need calibration based on changes in carbon-14 since the Flood; that would bring it down to probably less than 10,000 years. But there is no way to reconcile that number with 'millions of years.'





Left: Index fossils from the quarry dated to 189 million years old. **Right:** Fossil wood from the same site carbon-14 dated to less than 30,000 years! Note 1.

"Another example. Fossil wood from a deposit conventionally dated at 189 million years yielded carbon-14 dates ranging from 20,000 to 30,000 years old. They contained from 2.5% to 7.5% of the carbon-14 in things still alive right now, far, far above the assumed background contamination level of 0.2%. These, too, had chemical ratios 'consistent with the analyzed carbon in the fossil wood representing organic carbon from the wood of land plants'[66]

"Now consider the dilemma for evolutionists: either reject the carbon-14 dates, or else admit that the 'millions of years' dates are wrong! Of course they chose to reject the carbon-14 dates, even though there is no evidence of contamination. But in that case, why should we accept *any* carbon-14 dates?"

"Well then, what do *you* think about carbon-14 Professor Ho?" Xiao Li asked.

"I think there really is carbon-14 in those fossils, because they're not millions of years old. But all carbon-14 dating needs to be correctly calibrated before it gives an accurate date of the death of the fossil. Otherwise, carbon-14 often overstates the ages."

"And the other radiometric methods? The ones that give millions and billions of years?" asked Xiao Wang.

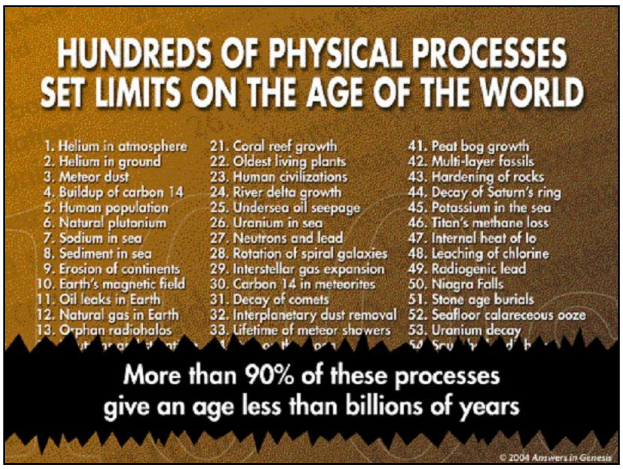
"There's something going on with that radioactive decay" admitted Professor Ho, "but the long ages interpretation scientists are presently giving us can't be correct."

"That sounds like you're just choosing what you want to believe!"

Hundreds of physical processes indicate a 'young' earth

"No, Xiao Wang, I'm choosing to go with the overwhelming majority of the scientific evidence. We've already discussed nine different 'clocks' just now which flatly contradict the ages reported based on radiometrics. And I didn't even mention:

10. There's too much helium still contained in minerals—in billions of years it would have leaked out long ago;
11. There's too little helium in the earth's atmosphere—in billions of years there would be over 1,000 times more;
12. The rate of mountain uplift is too fast to have continued for millions of years—mountains would be impossibly high;



13. There is not nearly enough rock of volcanic origin on the earth's surface if eruptions had been happening for hundreds of millions of years;
14. There's also not nearly enough sedimentary rock on the continents if deposition had been going on for hundreds of millions of years;
15. The moon would have spun much farther away from the earth than it is by now if both had existed together for billions of years, as conventional astronomers say they have;
16. The disks of our Milky Way and other rotating galaxies would have flattened out after a few hundred million years of spinning (the "winding-up dilemma");
17. The actual decay rate of the earth's magnetic field, including reversals, is too fast to have continued for even a million years;
18. There are far too few supernova remnants in the galaxy for the conventional evolutionary long ages;[67, 68]
19. Tightly folded rock layers[69]—"

Xiao Wang raised his hand and interrupted Professor Ho: "I get the point! But aren't there just as many evidences *against* your view?"

"No. And I believe anyone who objectively researches the question will come to the same conclusion. Let me tell you about someone who did.

"Dr. Russell Humphreys is a Ph.D. physicist who worked for many years in geophysics and nuclear physics at a major research laboratory in the US. He started out as an atheist and evolutionist, then became a Christian in college, but still believed in an 'old earth' for awhile. Finally he became a young earth creationist. Dr. Humphreys noted:

> I estimate that there are probably several hundred processes that one could use to get an idea of the age of the earth. Only a few dozen, at most, of these processes seem to give you billions of years. The other 90 per cent of those processes give you ages much less than billions of years.[70]

I know that if you take the trouble to honestly research the issue, you will reach the same conclusion. Which is more reasonable? To believe 90% of the evidence is wrong, or to believe the other 10% has been misinterpreted?"

"But you don't have a complete answer to radiometrics," Xiao Wang insisted stubbornly.

Professor Ho nodded, "That's right. I don't yet. But what I know about it's errors, and about all the other 'clocks,' makes it only reasonable to reject claims for long ages based on radiometrics."

"Is that really reasonable?" Xiao Wang wondered.

Professor Ho smiled. "Let me tell you a story.

"Once upon a time there was a high school student with a strict mother. When school was in session, his mother insisted that he study all day on Sunday until 4:00pm; then he was allowed to go outside and play for an hour. On the last day of summer vacation in August, the student went to the market and bought 100 cheap clocks of all shapes and sizes. His mother set all the clocks to the correct time. Unfortunately, none of the clocks kept perfect time. By the last Sunday in January, at one point 90 of the clocks said the time was somewhere between 2:00 and 2:15pm, while 10 of the clocks said it was after 4:00pm. Which clocks do you think the mother would believe?"

"The 90 clocks."

"Why?"

"It's more likely that 90 are right and 10 are wrong than the other way around."

"Which clocks do you think the boy would believe?"

Xiao Wang paused a moment, then laughed. "I guess he would believe the 10 clocks that said it was after 4:00!"

"Why?"

"Because he had an ulterior motive!"

"True enough! But it wouldn't be very reasonable, would it? It's more reasonable to believe the 90 clocks than the 10 clocks. The situation with radiometric dating is something like that. Since there are far more independent chronometers which indicate a relatively young earth than an old one, it is more reasonable to believe a younger age. Most of the scientists don't have an ulterior motive like the boy in our story. It's mostly just that they've never been taught much about the chronometers — the other 90 clocks — which show the earth is young. A few of them, though, the ardent defenders of evolutionary religion, know about it but refuse to consider it because, like the boy in the story, they don't want them to be true. But the fact is: the time isn't there."

<u>The Fossil Succession</u>

Xiao Wang sat lost in thought, his brow furrowed almost into a scowl. The entire worldview he'd held since elementary school was being shaken to the roots; it wasn't comfortable! But he was trying to honestly think things through. Suddenly he remembered the other problem. "But what about the order in which the fossils appear in the rocks? Isn't it true that it follows the evolutionary theory—with simple sea creatures on the bottom, then fish, then am-

phibians, reptiles and finally mammals?"

Professor Ho nodded gravely. "You've raised the hardest question, and the one that bothered me the longest. I can remember lying in bed in the middle of the night thinking to myself: 'But what about the fossil succession?' "

Xiao Li was surprised. "But with all the other evidence, why did *that* bother you?"

"People are different! Perhaps some would be satisfied without an answer to that question, but I was bothered by it. I still think it's the weakest point in young earth creationism. But I also know the evolutionary explanation they taught me in school can't be right. In reality, evolutionists have more problems with the actual nature of the fossil record than creationists do, despite a worldwide army of researchers working for the past two centuries to explain it within their framework.

"There certainly does appear to be some kind of 'sorting' or 'succession' in the fossil record," Professor Ho admitted. "It's a very rough sort, and the amount of overlap between different kinds of organisms is constantly increasing as more fossils are found. But there does seem to be an order to the types of organisms buried as you move upwards in the rock layers.

"Evolutionists claim that the trend is *chronological*: organisms were buried *when* they lived, from older to younger. Many creationists interpret the trend as mostly *ecological*: organisms were buried *where* they lived, from lower (ocean bottoms) to higher (continental uplands).

"The first thing to keep in mind is: the time is not there! The trend is not the result of millions of years or evolution. As we just discussed, there are far more indicators of a young age for the earth than an old age. And remember those dinosaur bones with red blood cells still in them!

"The second thing to keep in mind is that there are no actual transitional forms in the fossil record. We discussed that two weeks ago. [See chapter one.] We can't go over it all again now in detail, but you'll recall that there's no way to transform the 'billows' lung of a reptile into the 'through put' lung of a bird by tiny steps—the imaginary middle stages would result in death! And I hope you also remember that the most honest of the evolutionary paleontologists admit that the fossil record has yielded no transitional forms between basic types of bodies.

"The time is not there; the transitions are not there; therefore, the evolution is not there.

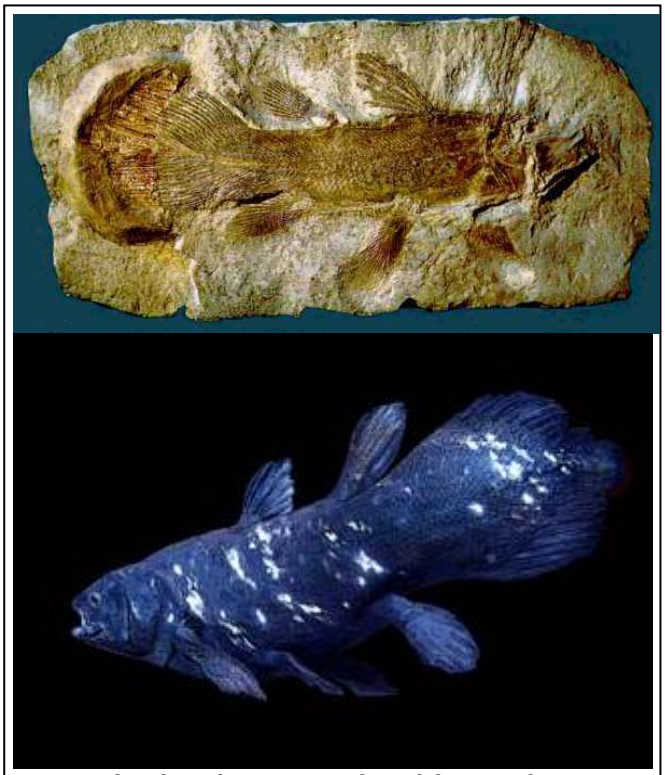
"All that is review. But the best proof I can give you that the fossil succession is not caused by *when* things lived by rather by *where* they lived is the so-called 'living fossils.' The living fossils prove that not finding fossils of an organism in certain rock layers does *not* mean that type of organism were not alive when those layers were laid."

Living Fossils

Professor flipped through another one of his books that crowded his shelves and stopped at a picture of a fossil. "What does this look like?" he asked the boys.

"A fish fossil" replied Xiao Li at once.

"Correct! How old do you think it is? I'll give you a hint: it was found in a layer of rocks dated to the time of the dinosaurs."



Top: Fossil coelacanth. Bottom: coelacanth living in the ocean today. Originally thought to be extinct. Missing from 65 million (imaginary) years of the fossil record, but obviously alive when those rock layers were deposited. Note 1.

By now both boys were too sophisticated to dare to give an answer of 'millions of years.' After a moment of silence, Professor Ho continued.

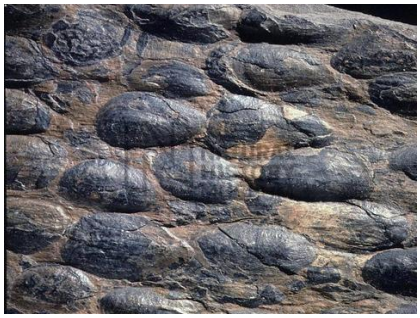
"I see you're learning! This is a very famous fossil fish called the coelacanth. It's fossils have been found in areas all over the world in rock layers dated by conventional geologists from about 350 million to 65 million (imaginary!) years old. It was long supposed to have gone extinct at about the same time as the dinosaurs.

Imagine the amazement of evolutionary scientists when a live coelacanth was caught off the southwest coast of South Africa in 1938![71] Then in 1952 it was found off the island of Anjouan near Madagascar. Apparently the locals had known about it for a long time:

> Several others have been caught in that area. It was later discovered that these fishes were well known to the islanders, who considered the flesh edible when dried and salted; the rough scales were used as an abrasive.[72]

Two more groups of coelacanths have been discovered, one near Indonesia in 1997 and one off the northeast coast of South Africa in 2000. No one knows it's present range for sure, but it is known to be alive and swimming in areas thousands of kilometers apart.

"The fish is big, up to more than a meter and a half long and 70kg in weight. It's known to feed at depths of nearly 200 meters, holding it's body in a vertical position



Top: Fossil shells. **Right:** Modern specimen with shell and pedicle (the 'root' sticking out below). The Lingula/Linguella form is missing from 450 million (imaginary) years of the fossil record, but obviously was alive when those rock layers were deposited. Note 1.

as it eats. Its appearance is unmistakable:

> …it has overlapping scales that give the body an armor of three layers of scales, a skull consisting of two nearly separate parts, teeth clusters on the upper jaw, a small tail and fin extending beyond the main caudal fin, hollow spines (hence the name *coelacanth*), and fins located on limblike extensions from the body.[73]

Apparently it's a very good candidate for fossilization since it's found all over the world. But it is never found in rocks 'younger' than about 65 million years old according to evolutionary dating. Yet it's still alive today. Clearly it was alive when those later rock layers were being laid—but it left no fossils in those higher layers, so far as we know."

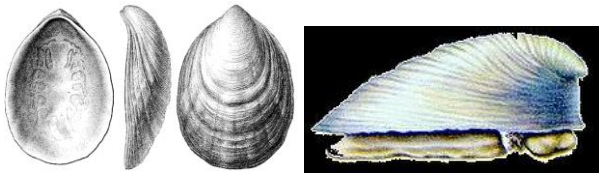
Xiao Li looked puzzled. "Why is that important?" he wanted to know.

This time is was Xiao Wang who answered him. "Don't you see? The coelacanth was alive during all that time, but it left no record in the fossil rock layers. That means just because something doesn't show up anywhere in a range of rock layers doesn't mean it wasn't alive then."

Professor Ho beamed at him. "Precisely! It shows that the fossil succession in the rock record is by no means necessarily a chronological sort. Everyone agrees that the coelacanth was alive when those so-called '65 million years worth' of rocks were being laid down, but it doesn't appear in them. Never finding fossils of an organism in certain layers provides no evidence that the organism was not alive at that time!"

Xiao Wang was quick to grasp the implications. "I suppose you'll say that applies to human fossils not being found with dinosaurs—it doesn't prove humans weren't alive at the same time!"

"Yes, I will say that," Professor Ho confirmed. "But first, a few more examples of these so-called 'living fossils' so you can know the coelacanth is not a fluke."



Left: Fossil Pilina. **Right:** Pilina (Neopilina) living today. Originally thought to be extinct. Missing from 350 million (imaginary) years of the fossil record, but obviously alive when those rock layers were deposited. Note 1.

"Let's begin with one of the oldest. There's a small shellfish found in many places in the world called the Lingula. It belongs to the large Inarticulata class of Brachiopod shellfish. Fossils similar to the modern Lingula are only found in layers 'dated' more than 450 million years old.[P] The fossil form is called the 'Linguella,' but it is really just our modern Lingula, buried *where* it lived before Noah's Flood. Apparently this exact form is not found in subsequent, higher layers which supposedly required 450 million years to be laid down. Obviously it existed when those layers were being deposited—it still exists today!—but it left no fossil record. Absence from those sections of the fossil record does not mean it didn't exist then.

"Another living fossil is the neopilina, a shellfish that lives on the deep ocean floor. Like the coelacanth, it was first known as a fossil form. Then it was unexpectedly found alive in 1952. It's called the 'neo,' that is, 'new,' pilina, because before that the pilina was thought to have been extinct for about 350 million years:

Left: Fossil of Wollemi Pine (*Agathis jurassica*) with leaves of modern Wollemi Pine (*Wollemia nobilis*) on top. Leaves are identical. **Middle:** Wollemi Pine branch growing today. **Right:** Top of Wollemi Pine tree growing today. Originally thought to be extinct. Missing from 150 million (imaginary) years of the fossil record, but obviously alive when those rock layers were deposited. Note 1.

> Probably even more unusual than the discovery of living coelacanths is the finding of a deep-sea mollusk (Neopilina) that paleontologists [used to] claim became extinct…during the Devonian period [400-360 million years ago]. [Living] specimens have turned up in nets dredging the deep water off the coasts of Cen-

[P] This statement refers only to the Linguella. Fossils of other kinds of shellfish belonging to the Inarticulata class are found in rock layers which have been assigned to various geological 'ages.'

tral and South America. One of the main characteristics of the phylum Mollusca is nonsegmentation, but these small univalves suggest segmentation – they have five or six pairs of gills.[74]

The 'neopilina' is just the 'pilina'—alive today, but missing from 350 million supposed years of rock layers.

"In 1994, a park ranger in an Australian National Park about 200km west of Sydney found the Wollemi Pine—a living fossil whose 'foliage is virtually identical to one of it's supposed fossil ancestors, the late Jurassic [tree] Agathsis jurassica,'[75] which had supposedly been extinct for 150 million years. The fossil forms have been dug up less than 100km away from the living trees, but no one had ever noticed these unique trees still living in the National Park.

Left: Skeleton of Tuatara. **Right:** Live tuatara. Originally thought to be extinct. Missing from 135 million (imaginary) years of the fossil record, but obviously alive when those rock layers were deposited. (Also see footnote Q.) Note 1.

"The tuatara is a rather ugly but important reptile. A creationist scientist summarizes this living fossil:

> Most zoology textbooks describe the Tuatara as a relic of the past. Although it looks like a lizard, several anatomical and physiological characteristics distinguish it as the only survivor of the order Rhynchocephalia, or beak-headed reptiles. Living specimens currently live only on islands off New Zealand, where they dwell in holes on sandy hills by the shore.
>
> …The last fossil evidence for it appears in the early Cretaceous, which supposedly leaves a time gap of 135 million years.[Q] The skeletons of these reptiles found in Jurassic deposits of Europe closely resemble living tuatara. Such similarity should suggest that only a short time has elapsed, insufficient for [hypothetical, so-called] evolution to change the morphology of the tuatara. It is much easier, and in accord with the evidence, to believe that the species has actually survived just a few thousand years since the Flood.[76]

"Finally, a more 'recent' example—if you call 20 million years missing from the fossil record recent. The Metasequoia tree was first known to the scientific world from fossil specimens and assumed to be extinct. In the 1940s it was found growing in Sichuan province:



Left: Fossil Metasequoia foliage. **Middle:** Metasequoia foliage from tree living today. **Right:** Living Metasequoia tree. Originally thought to be extinct. Missing from 20 million (imaginary) years of the fossil record, but obviously alive when those rock layers were deposited. Note 1.

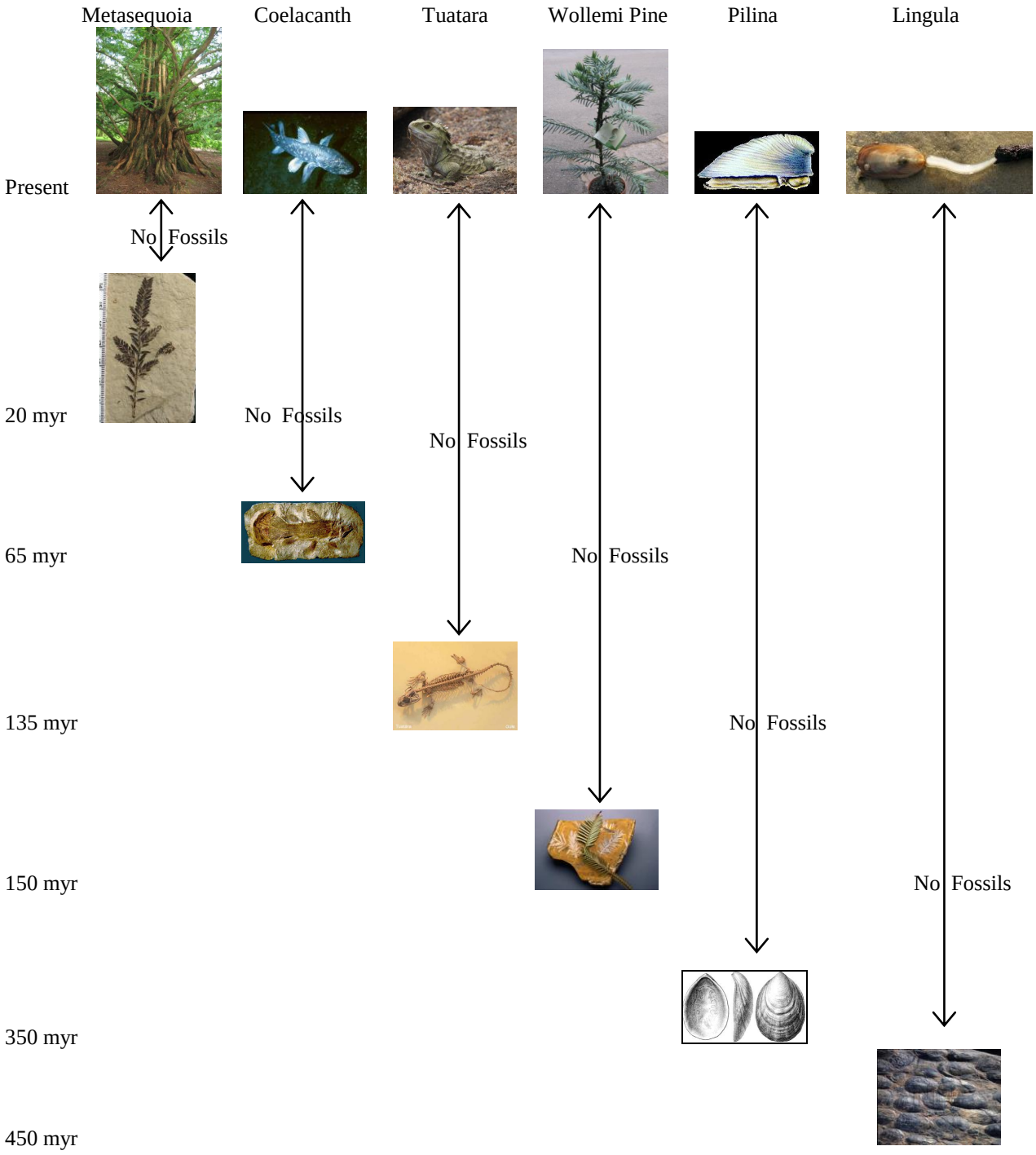
The abundance of fossil specimens indicated widespread distribution in the northern and middle latitudes of Asia and North America during the Cretaceous and…Tertiary periods [about 135 to 20 million years ago]. Until living trees were discovered in the 1940s, Metasequoia was thought to be extinct. Only a few thousand trees are known to have survived in central China, at altitudes of 700 to 1,400 m …. Since these stands were discovered, seeds and cuttings have been planted throughout the world.[77]

Here again, the fossil record is abundant worldwide—and then suddenly stops, even though the tree was obviously still alive."

[Q] In 2009 it was claimed that three small fragments of tuatara jaw bones had been found in New Zealand, 'dated' to 16 –19 million years old. Assuming this is accurate, it still does little to fill in a 135 million year gap. And it is further evidence that having not yet found a given organism in a given fossil layer does not mean that it was not living when that layer was deposited.

"I've only given you a small sample of the many living fossils. The one's we've discussed are summarized in this chart, but remember, there are many others. These force us to a simple but profound conclusion: absence from a rock layer does not mean an organism was not alive when that layer was laid down. When we recognize this fact, any belief in an orderly 'fossil succession' is greatly weakened. But I confess it doesn't solve the entire problem."

Living Fossils: Some organisms still living today are missing from tens of millions of (imaginary) years of the fossil record. Not finding fossils of an organism in rock layers from does *not* mean it was not alive on the earth when those rocks were being deposited. This is strong evidence against an 'evolutionary succession' in the fossil record.



"And now Xiao Wang," Professor Ho continued, "we can return to your question about why we don't find humans buried with dinosaurs. Of course, perhaps they simply haven't been found yet by scientists (like coelacanths in the ocean before 1938), or have been overlooked by scientists not expecting to find them (like soft tissue in dinosaur bones). And maybe the human population was small at the time of Noah, so we wouldn't expect to be lucky enough to find anyone fossilized in Flood laid layers.

"But those are speculations. The question about humans and dinosaur buried together really implies a larger ques-

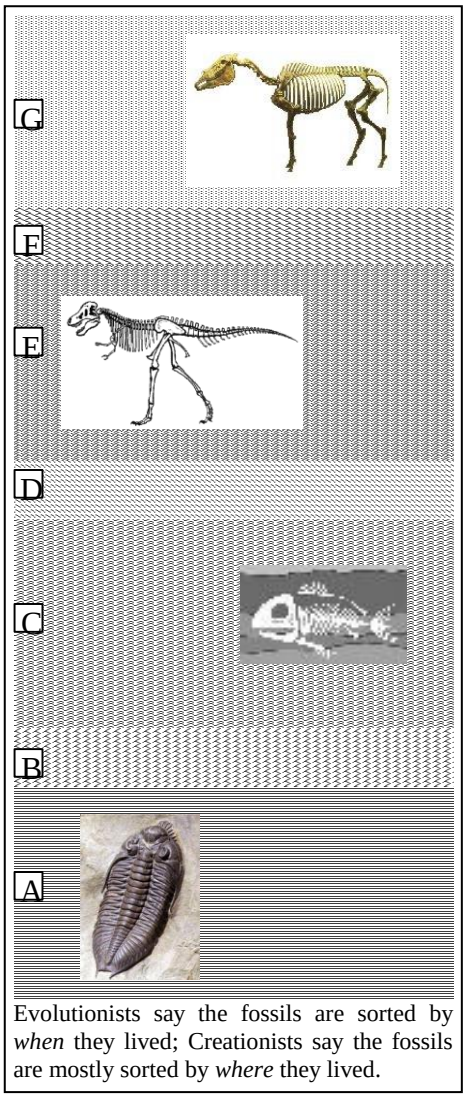
tion, the question of what is called the 'faunal succession': why does it seem that different groups of plants and animals are buried at different levels in the fossil record?

"It certainly *doesn't* prove what the evolutionists claim: that fossil organisms only found buried in the upper layers didn't exist yet when the lower layers were being laid. We've already seen that absence of an organism from a given set of layers doesn't mean an organism wasn't alive then; that's the lesson of the coelacanth and the other living fossils. Furthermore, as we demonstrated above, long ages did *not* pass between the layers.

"But at the same time, there does seem to be a sorting of fossil types in the rock record. How do creationists account for it? The most widely accepted theory at present is ecological zonation.

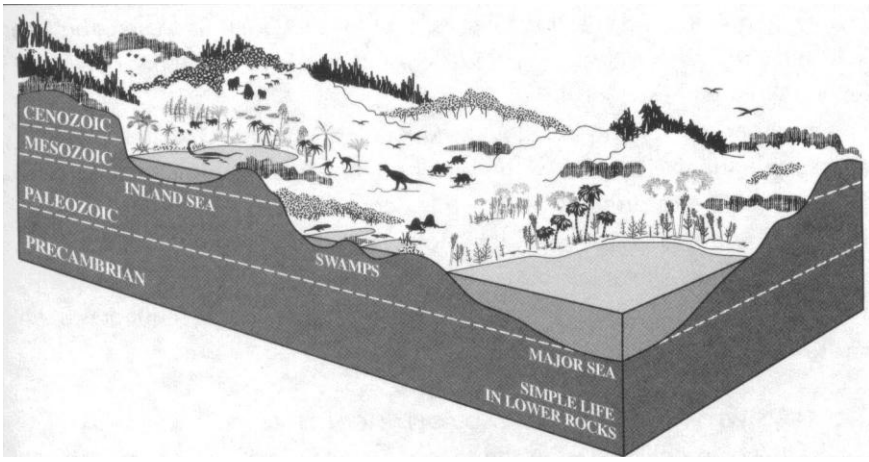
"In simplest terms, the ecological zonation theory envisions a biosphere that had a much richer diversity of plant and animal life than our world does today, more reflective of God's original 'very good' creation. At the same time, helping to preserve this diversity, the earth then was much more strictly divided than it is now into differing ecological zones containing different groups of plants and animals. These zones were partly separated by height. The dinosaurs would have been down in the lowlands; humans and most mammals in higher zones. One creation scientist, a Ph.D. zoologist, describes the idea this way:

> It is reasonable to assume that before the flood the distribution of plants and animals varied from place to place, as it does now. Polar bears do not live in the tropics. We also easily note ecological differences in mountainous areas where the plants and animals at lower altitudes vary significantly from those higher up. … One creationist explanation for the geologic column, called the 'ecological zonation theory,' proposes a preflood ecological distribution somewhat similar to the distribution of fossils in the geologic column. In this model, dinosaurs and human beings lived at the same time, but in different ecological environments. Humans inhabited higher elevations.
>
> … A sequence of fossils would result as slowly rising floodwaters *sequentially* destroyed the various preflood landscapes along with their unique organisms, redepositing them in order in large depositional basins of the continents. … The order of the fossils in such sedimentary basins would reflect the order of the eroded landscapes destroyed by the gradually rising waters.
>
> ….
>
> The proposed preflood ecologic sequence [see figure] begins with simple life in the rocks in the lower regions. Many animal groups would dwell in the lowest preflood seas, while 'coal' forests, amphibians, and reptiles would abound in hot, swampy lowlands. Flowering plants and warm-blooded animals, such as birds and mammals, including human beings, would occupy the higher and cooler regions. This general sequence fits the fossil record.[78]



Evolutionists say the fossils are sorted by *when* they lived; Creationists say the fossils are mostly sorted by *where* they lived.

The ecological zonation theory says groups of organisms were buried together according to *where* they lived, not *when* they lived."



Ecological zonation model: Pre-flood organisms lived in different zones segregated by altitude. So-called 'earlier' organisms lived in lower zones and were the first to be buried in Noah's Flood. From Note 9, Pg. 171. Note 1.

"So you mean humans aren't found buried with dinosaurs because they didn't live in the same areas?" asked Xiao Li.

"Exactly," Professor Ho nodded. "Humans would have mostly lived with other mammals in the uplands. Think of a modern example: penguins are never buried with banana trees, nor parrots with polar bears, not because they don't live at the same *time* but because they never live in the same *place*."

Xiao Wang seemed dissatisfied. "It sounds too simple, and too contrived," he complained.

"There are many unanswered questions," Professor Ho agreed.

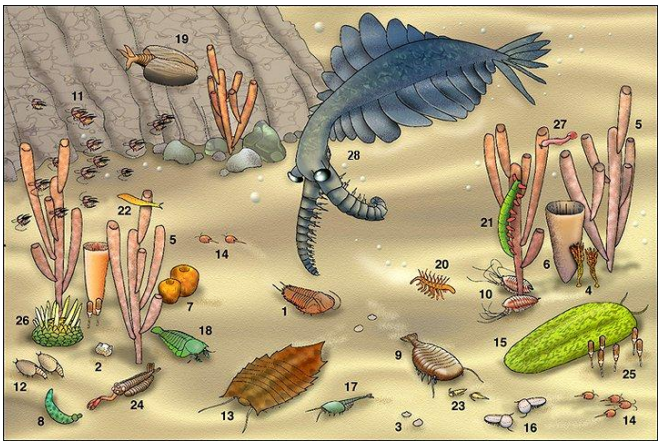
"But let me give you some additional evidence. The ecological zonation theory explains two well known facts which do not fit with the conventional evolutionary viewpoint:

1. many different life forms 'suddenly' appear in the fossil record in the same layer all over the world;
2. many different forms 'suddenly' disappear in so-called 'mass extinctions' in the same layers all over the world.

Both of these facts are a horrible contradiction to the 'gradual evolution' view of the fossil record, but both fit perfectly with the ecological zonation theory."

Sudden appearance in the fossil record: the Cambrian explosion

"First consider the abrupt appearances. The Cambrian explosion is the best know example. In rocks below the Cambrian layers, for the most part, the only fossils seem to be microorganisms.[R] Incidentally, bacteria and other microorganisms live in deep rocks today, even five kilometers below the surface,[79] so it's not strange to find their fossils in layers below the Cambrian. They are buried in the fossil record in some of the same places where they live today—deeper than anything else!



An evolutionary artist's conception of a few of the organisms found in so-called 'Cambrian' layers. A large variety of radically different kinds of highly complex organisms all appear 'suddenly' in the same rock layers, with no evolutionary 'ancestors' or 'intermediate forms' below them. Note 1.

"In deep rock layers regarded as Cambrian period by evolutionists, fossils are found which belong to almost every animal phylum (about forty phyla). All of them—sponges, jellyfish, corals, crabs, trilobites, all the rest—appear fully formed, with no trace of ancestors, no sign of evolution! In fact, most of them first appear within a very narrow range of rock layers, what evolutionists would call 5 to 10 million years.[80] None of the major types have any transitional, evolutionary ancestry; jellyfish are jellyfish, trilobites are trilobites, right from the beginning. They appear suddenly, fully formed, and already very complex. It's nothing like an evolutionary succession.

"All of the lowest forms are marine species. The sudden depositing of a vast variety of ocean dwelling organisms in the same layers at the bottom of the record fits well with the ecological zonation theory: all these ancient marine animals were alive at the same time in roughly the same place, so they were buried, for the most part, in the same *rapidly deposited* layers. They appear in the lowest rock layers because they lived in the lowest levels—on or near the sea bottom.

"Of course, the evolutionists would complain that I've oversimplified things, but the fact is they know themselves that major transitions between forms do not exist in the fossil record [see chapter 1]. And as we discussed earlier today, there was no great passage of time as successive rock layers were laid down. No evolutionary transitions plus no time means no evolutionary fossil succession. Fossils were buried according to *where* they lived, not *when* they lived."

Sudden disappearance from the fossil record: mass extinctions

"Next, consider abrupt disappearances, what evolutionists call mass extinctions. The best known is the sudden disappearance of dinosaurs from the fossil layers after the so-called Cretaceous period."

"I've heard that was because of an asteroid impact!" Xiao Wang interrupted.

"We used to hear that, but the evolutionists themselves have generally rejected that idea now, since dinosaur bones have been found in layers believed to be *above* the impact layer.[81] The asteroid impact was probably a relatively minor event during Noah's flood. It's the flood that buried the dinosaurs.

"But there are many other examples of mass extinctions—that is, huge varieties of organisms *not* leaving a fossil record above a certain set of layers. Dr. Snelling is a creationist with a Ph.D. in geology. Here how he describes it:

> There are some 17 mass extinction events in the fossil record recognized by geologists. … However only eight of those are classed as major mass extinction events…. … Most people have probably heard about the end-Cretaceous mass extinction event, because that's when the dinosaurs are supposed to have been wiped out, along with about a quarter of all the known families of animals. However, the end-Permian [a lower rock layer, supposed to have ended 230 million years ago] mass extinction was even more catastrophic, because 75% of amphibian families and 80% of reptile families were supposedly wiped out then, along with 75% to 90% of all pre-existing species in the oceans.[82]

It's really an intractable problem for evolutionists. What could have happened all over the world at about the same time that was so severe it wiped out most types of life? How could it have been so efficient and so worldwide in its impact? And why did it happen repeatedly throughout the (imaginary!) stretches of geologic time?

[R] For purposes of this discussion, the Ediacaran fossils will be grouped with the Cambrian. The complex Ediacaran fauna found in Precambrian rock layers are a problem for evolutionists, not creationists!

"In fact, these 'mass extinctions' really just mean that the fossil record for many groups comes to a sudden end as you go up through the layers. This would correspond well to rising flood waters burying organisms which lived in zones at different heights. As the floodwaters rose, many organisms in lower zones would be completely wiped out, either buried or dispersed, and could leave no more fossils in higher layers. The so-called 'mass extinctions' in the fossil record might help us define the ecological zones of the pre-flood world."

The conclusion: There is a Creator; the earth looks young!

"I'm well aware that I haven't proven anything in this brief discussion. Much more extensive treatments are available in creationist literature. If you still have questions or doubts, I strongly encourage you to go and read them.[S] I strongly believe that what Jesus said is true: If you seek the truth, you will find it. If you have doubts, do what I did: Keep looking!

"In the Bible, God clearly told us that He directly created living things. God also told us that through examining the world and reasoning about our observations—in other words, through science—we would be able to know that a supernaturally powerful, divine Creator exists.

> For since the creation of the world His invisible attributes, His eternal power and divine nature, have been clearly seen, being understood through what has been made, so that they are without excuse. (Romans 1:20 NAS)

We discussed that the first time you came. [See chapter one.] I think it has been absolutely proven scientifically.

"In the Bible, God also clearly told us the earth is relatively young, on the order of ten thousand years old, and that He sent a global flood. I am totally convinced of both of those facts. However, God did *not* promise that we would certainly be able to use science to absolutely prove there was a Flood and the earth is only around ten thousand years old. Our scientific ability to infer what happened in the distant past is very limited. I believe the overwhelming majority of the scientific evidence points to a young earth and a global flood, but it should not surprise us that there are still some things which are not clear yet."

But how do you know it's the God of the Bible?

Again the three were silent for awhile, Xiao Wang looking down at Professor Ho's cluttered desktop. Then suddenly he looked up and said earnestly: "You know Professor Ho, I still have lots of questions. But my whole view of life and the world has changed. I feel like I'm not the same anymore. Now that I know there must have been a Creator, there must be some reason behind everything, everything must be for a purpose, it's, it's—it's not the same anymore!"

Professor Ho smiled warmly and nodded several times. "I think it would be fair to say you've emerged—or escaped!—from the prison house of atheism, Xiao Wang. Haven't you?"

Xiao Wang nodded slowly and silently.

"I agree," continued Professor Ho, "that it's a different world, a whole new universe. I remember my feeling: There's a Creator! He must have a purpose for all this. Perhaps He knows about me; perhaps He cares about me. And then in the Bible I found out who He is and that He really does love me."

"That would be beautiful," Xiao Wang agreed. "But I still have a problem. How do I know the Creator is *your* God, the 'Yahweh' in the Bible?"

"I quite understand," Professor Ho replied. "We haven't yet proven that the Bible is true and Yahweh is God. All we have done so far is shown that there must be a Creator. We've taken the first step—the 'prison break' out of atheism. But there are still two steps to go to demonstrate the truth of Christianity. The logic runs like this:

1. Nature demonstrates that a supernaturally powerful, non-material Creator exists.
2. History and archeology demonstrate that the Bible records are historically accurate and allow us to approximately date when the Bible was written.
3. Prophecies written in the Bible and fulfilled long afterward demonstrate that it is a revelation from God.

Would you like to examine the historical reliability of the Bible?"

"Yes!"

"Great! Let's start with that the next time you come."

Appendix 3-1: How old is the earth according to the Bible?

The overwhelming majority of the scientific evidence is against the frequently heard claims that the earth is billions of years old and human-like creatures have been developing on it for millions of years. But how old is it really?

A possible reading of the Bible would place creation at about 4000 BC. This calculation is based on the genealogies in Genesis chapters 5 and 11. From Abraham onward, it is relatively easy to calculate the time passed to the accession of King David. This is a period of about a thousand years, give or take a couple of hundred. From David's time on-

[S] As a starting point, readers may consult the references in Notes 9 and 82. For a discussion of so-called 'index fossils,' see Woodmoreappe, John, Studies in Flood Geology: A Compilation of Research Studies Supporting Creation and the Flood, Institute for Creation Research, 1993, especially the chapters titled "The Cephalopods in the Creation and the Universal Deluge" and "A Diluviological Treatise on the Stratigraphic Separation of Fossils.

ward, dates can be assigned to within a precision of a decade or so.

The key question, then, centers on the genealogies in Genesis 5 and 11. Are they continuous, or are there gaps in them? If there are no gaps, the earth is about 6,000 years old—certainly less than 7,000.

Question 1: Is it reasonable to expect gaps in the genealogies?

It is a known fact that Biblical genealogies sometimes skip over generations without explicitly stating it. The terms "son of" and "became the father of" can be used to mean "descendent of" or "became the ancestor of."

One example is in Ezra 7:1-5, where Ezra traces his ancestry back to Aaron. Only 16 generations are listed for what was probably more than 1,000 years of time. Zadok (v.2) was high priest in 950 BC and Hilkiah (v.1) was high priest in 639 BC, but only one name, Shallum (v.2) is listed between them.

Another example can be cited from the New Testament gospel of Matthew, in chapter one. Matthew was a Jew writing primarily for Jews. Following what must have been an accepted convention, Matthew organizes his genealogy into three lists of 14 generations each. The middle list, Matthew 1:7-11 covers the kings of Judah from Solomon (died c.925 BC) to Jeconiah (died after 561 BC). In v.8, this genealogy skips kings Ahaziah, Joash, and Amaziah between the names Joram and Uzziah. In v.11, king Jehoiakim is skipped between Josiah and Jeconiah. Matthew did not skip these by oversight or with intention to deceive. The names and father-son relationships of the omitted kings were known to every Jew. Matthew purposely organizes his genealogy to correctly portray the line of descent. He limits each section to a set number of names, perhaps based on the 14 names in the first section, where only 14 names were available to him from the Old Testament.

The third section of Matthew's genealogy, vv.12-16, covers the period 597 BC to c.5 BC, about 593 years. Only 13 generations are added in that period. This would imply an average of 45.6 years per generation, which is not realistic. The middle section, vv.7-11, plus David, covers 385 years while adding 18 generation, an average of about 23.5 years per generation. This is very realistic, especially for ancient times when marriages were early. It is virtually certain that Matthew 1:12-16 also has gaps.

Thus we can see that a Jewish writer of genealogies would not necessarily indicate when he skipped over generations. This is neither deceit nor inaccuracy, since the genealogies are meant to correctly delineate the line of descent, and they do so. They are not required to be exhaustive.

Question 2: Is there evidence for gaps in Genesis 5 and/or 11?

The mere fact that a Jewish writer *might* skip generations does not, of course, mean that Genesis 5 or 11 necessarily *does*. There are several lines of evidence, however, which might indicate some generations are passed over.

The timeframe of a 'no gaps' genealogy does not seem to fit the social and moral conditions of Abraham's day. No gaps in the genealogy of Genesis 10 would require Noah dying only two years before Abraham was born and Shem still being alive when 40 year old Isaac got married! In fact, all of the patriarchs from Shem to Terah would have been alive when Abraham was born, except Peleg and Nahor. It is surprising to find no mention of their activities or burials.

Related to that, the record of Abraham's life seems to imply that all or most of the earth had already long descended into idolatry by his time. It seems hard to believe this could have occurred if Noah's son Shem and grandson Arpachshad were still alive. Compare, for example, the Jews' descent into idolatry after entering the promised land. It did not happen until the elders who had known Joshua had died out (see Judges 2:7-12).

Furthermore, the time and number of generations available to populate the earth seems insufficient if there are no gaps in the genealogies. To achieve even a total world population of 25 million in Abraham's day would have required an average of nine reproducing offspring per couple, with that rate sustained across nine generations. This does not seem feasible—at least not by the time of Nahor, Terah and Abraham.

Finally, it is somewhat surprising that the number of patriarchs from Adam to Noah in Genesis 5 is ten, while the number from Shem to Abraham is also ten. This might indicate a structuring which forces sets of ten, just as the second and third parts of Matthew's genealogies were forced into sets of 14.

Question 3: How much time could reasonably be expected to have been skipped?

Affirming that there may be gaps in the genealogies need not lead us onto a 'slippery slope' toward allowing for millions and billions of years. To return to our known Biblical examples, the gaps in Matthew 1:7-11, 13 generations (14 names) are listed, while 4 are skipped. That it is about 70% complete. In Matthew 1:12-16, 13 generations are listed from Jeconiah's deportation to Babylon in 597 BC to the birth of Jesus in c.5 BC. In those 593 years we would have 25 expected generations, based on the known average generation length of 23.5 years from David to Jeconiah. Thus it would be approximately 50% complete. Finally, in Ezra 7:1-5, a maximum of 1,100 years is covered in 16 generations. Based on the same rate, we would have expected 47 generations. Thus only about 33% of the generations are listed.

If there are no gaps in the Genesis 11 genealogy, approximately 450 years passed from the Flood to the birth of Abraham. Using the rough number of 33% calculated from Ezra 7:1-5, we would increase that to about 1,500 years. Even if we assume ten times more gaps than that—in other words, assuming only 3% of the actual generations are listed—we would still only allow about 15,000 years from the Flood to Abraham. It hardly seems reasonable to assume 100 or 1,000 times more names are skipped than are listed! There is no room for 100,000 years, much less one million.

We have no particular reason to question the completeness of the genealogy from Adam to Noah in Genesis 5, aside, perhaps, from the fact that it forms a set of exactly 10. It is hard to make any estimate about possible gaps there.

Conclusion: Perhaps 10,000—20,000 years

Based on the discussion above, it would seem that there are very possibly gaps in the genealogy in Genesis 11. These might reasonably be assumed to cover not more than about 15,000 years at a maximum. Thus the total age of the earth might be on the order of 10,000—20,000 years. This writer inclines toward a figure in that range. At the same time, he does not discount the possibility of the straightforward, 6,000 year reading of the text.

Appendix 3-2: Who were the 'sons of God' and the 'Nephilim' in Genesis 6:2, 4?

> 1 Now it came about, when men began to multiply on the face of the land, and daughters were born to them, 2 that the sons of God saw that the daughters of men were beautiful; and they took wives for themselves, whomever they chose. … 4 The Nephilim were on the earth in those days, and also afterward, when the sons of God came in to the daughters of men, and they bore *children* to them. Those were the mighty men who *were* of old, men of renown. (Genesis 6:1-2, 4 NAS)

Many readers have wondered who the 'sons of God' and the 'Nephilim' are. Some have suggested that the 'sons of God' were fallen angels who co-habited with human women, producing a race of wicked giants called the 'Nephilim.' There are no good grounds for that interpretation. Very, very probably both these terms just refer to human beings before the Flood.

First, the term 'sons of God' probably simply means 'males.' Similar expressions which certainly refer to human beings are used elsewhere in the Bible. Adam is called the son of God:

> the son of Enosh, the son of Seth, the son of Adam, the son of God. (Luke 3:38 NAS)

Jewish leaders are referred to as 'gods' and 'sons of the Most High [God]':

> I said, "You are gods, and all of you are sons of the Most High. (Psalm 82:6 NAS)

> Jesus answered them, "Has it not been written in your Law, 'I said, you are gods'? "If he called them gods, to whom the word of God came (and the Scripture cannot be broken), (John 10:34-35 NAS)

And Abraham is referred to as a 'prince of God' by the Canaanites:

> "Hear us, my lord, you are a mighty prince [lit. 'prince of God'] among us; bury your dead in the choicest of our graves; none of us will refuse you his grave for burying your dead." (Genesis 23:6 NAS)

Clearly the term 'sons of God' *can* refer to human beings. It is possible that the term in Genesis 6:2, 4 means great men, or rulers, but there is no reason to think it refers to angels. Most likely, the term 'sons of God' in Genesis 6:2, 4 just refers to males, in contrast to the 'daughters of men,' females. These usages might be in remembrance of the fact that God directly created Adam, but made Eve from Adam's rib. In support of this view, note also that the phrase 'daughters of men' is literally 'daughters of Adam.'

Second, notice that the phrase in verse 2 'took wives for themselves' is the ordinary Hebrew expression used for lasting human marriages, not just cohabitation. Angels do not marry:

> For in the resurrection they neither marry, nor are given in marriage, but are like angels in heaven. (Matthew 22:30 NAS)

In fact, angels apparently are pure spirits without bodies:

> And of the angels He says, "Who makes His angels winds, and His ministers a flame of fire." … Are they not all ministering spirits, sent out to render service for the sake of those who will inherit salvation? (Hebrews 1:7, 14 NAS)

Although angels sometimes have the appearance of a body in the Bible, note that God, who is certainly a pure spirit, also sometimes temporarily takes on the appearance of a body (see Genesis 18:1—19:1). There is no reason to think that angels could cohabit with human females—much less marry them.

Finally, regarding the offspring of these unions, in Genesis 6:4 the term 'Nephilim' is used. The only other place in the Bible where the same Hebrew word is used refers to a group of unusually tall and strong people who were living in Canaan when the Jews came out of Egypt:

> "There also we saw the Nephilim (the sons of Anak are part of the Nephilim); and we became like grasshoppers in our own sight, and so we were in their sight." (Numbers 13:33 NAS)

Members of this people group were unusually large, but they were still ordinary human beings.

In summary, the term 'sons of God' probably just means males or at most great men or rulers, and the 'Nephilim' were perhaps gigantic but still ordinary human offspring.

The suggestion which has been made by some in recent years that 'sons of God' could refer to 'space aliens' is completely foreign to the worldview of the Bible and has no basis in any Biblical text.

We should not read mythology about space aliens or fallen angels cohabiting with humans into the Bible.

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http://chinesecreationscience.org/文章/
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[1] Pictures come from:
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