Impact

**Do Tsunamis Come in Super-size?** (#382)

by William Hoesch, M.S.

***Abstract*** *The catastrophe began on December 26, 2004, with a magnitude 9.0 earthquake in the deep-water Sunda Trench offshore Sumatra. Within 3-4 minutes, a 1200 kilometer-long rupture opened the seafloor, and a region roughly the length and half the width of California was displaced vertically by about two meters.*

Fast-food consumables like french fries are known to come in "super-size." According to Hollywood, tsunamis do also. But is there scientific evidence for super-size tsunamis in the past? The Indian Ocean tragedy has brought attention to the fact that these large water waves rank among earth's most severe natural disasters. Because water is incompressible, disturbance at the ocean floor generates a surface wave. In deep water such waves propagate at speeds (celerity) as high as 800 kilometers per hour, and their passage through the deep ocean is barely perceptible. As water depths shallow, however, wave energy becomes packed into a smaller column of water, the wave slows, or "shoals," and its form builds to fearsome proportions.

### **The Indian Ocean Tsunami of 2004**

The catastrophe began on December 26, 2004, with a magnitude 9.0 earthquake in the deep-water Sunda Trench offshore Sumatra. Within 3-4 minutes, a 1200 kilometer-long rupture opened the seafloor, and a region roughly the length and half the width of California was displaced vertically by about two meters. The work involved is a measure of the raw energy imparted to the tsunami. In this case, it was equivalent to about 100 Hiroshima-sized atomic bombs.1

Directly east of the epicenter lies the coastline of Sumatra's Aceh province which experienced wave run-ups as high as 30 meters above sea level (height of a ten-story building). Across the Indian Ocean, the Sri Lanka coast received devastating waves with run-ups to 10 meters. Hollywood imagery of steep-fronted and curling waves may appear spectacular, but are generally not true. Rather, tsunamis are best likened to an advancing plateau of water, and the shape of the wave front has probably less significance than the mass of water behind it. Both the rushing waves and receding waves do geologic work, creating distinctive sedimentary deposits.

### **Earthquake-generated Waves**

Four mechanisms are responsible for most, if not all, tsunamis: earthquake, landslide, volcano, or extraterrestrial impact. The Indian Ocean tsunami was an example of the earthquake-generated type, but there have been many others. In 1755 a big wave struck Lisbon, Portugal, following an estimated 8.7M earthquake that reduced that nation's shipping industry and navy to a shambles overnight. A seismically active deep-sea trench very similar to the Sunda Trench seems poised off the Washington-Oregon coast. Evidence for several tsunami strikes over the past few hundred years has been found by geologists in the coastal marshes of the Pacific Northwest.2 The tsunamis in these cases were probably comparable in size to the December 26, 2004, Indian Ocean event.

Shallow-focus earthquakes, the kind that generate most tsunamis, seem to be size and energy limited. Deep-focus earthquakes, on the other hand, are generated by an entirely different process. Low density minerals (like olivine) can transform to higher-density minerals (like spinel and perovskite), abruptly changing the volume of rocks.3 Volume reduction associated with this sudden phase-change is capable of delivering an immense seismic jolt. Historic deep-focus earthquakes may represent mere residual stresses left over from much greater, planet-wide plate movements that are modeled to have accompanied the Genesis Flood. Magnitude-13 earthquakes and greater are conceivable during this time of theoretical whole-mantle overturn.4 Herein lies a mechanism for generating "super-size" tsunamis in the past.

### **Landslide-generated Waves**

Big waves that struck the sparsely populated Newfoundland coast in 1929 and the north coast of Papua New Guinea in 1998 testify to landslide processes. Landslide scarps and debris deposits from both tsunamis have been located on the ocean floor.5 Thus, the evidence for past tsunamis can be found by wash marks on shore, or, indirectly, in the form of large landslides, scarps, and debris piles lying on the deep ocean floor.

Landslide debris covers the mostly underwater Hawaiian Ridge over an area that is five times greater than the area of the Hawaiian Islands themselves.6 Individual landslides have been identified that are as large as 17,000 cubic kilometers. Underwater mapping reveals a lumpy appearance to the deposits that is strikingly similar to that left by the 1980 Mount St. Helens landslide, only 1000 times larger. These landslides must have traveled underwater at speeds on the order of 100 kilometers per hour and unquestionably caused monstrous tsunamis. But how big were they? Basalt cobbles and reef debris found 375 meters above present sea level on the island of Lanai, testify that waves ten times the height of those that recently struck Sumatra washed the debris onto the Hawaiian mountainsides. Similar landslide debris offshore from both New Jersey and Oregon testify of enormous past tsunamis that struck the U.S. mainland.7

The largest landslide-generated tsunami appears to have occurred when the entire continental shelf surrounding the Gulf of Mexico gave way, and produced 200-meter-plus tsunamis across that region.8 The trigger for this simultaneous collapse across such a large area is postulated to have been the Chicxulub (extraterrestrial) impact on Mexico's Yucatan peninsula. Some of North America's largest oilfieldsowe their existance to sediments moved by this tsunami.9 Oilfield geologists take catastrophic geology seriously in the Gulf region.

### **Volcanic-collapse Generated Waves**

Large composite-cone volcanoes usually collapse inward after eruption and form a crater like depression called a caldera. If near sea level, the sudden rush of ocean waters into a hot and instantly formed caldera can generate impressive tsunamis. The crater left by the explosion of Krakatoa (1883) in Indonesia's Sunda Strait measures about 5 kilometers by 6 kilometers. The sudden infilling of this caldera with seawater is the probable cause for tsunami wave runups of 37 meters on neighboring coastlines that killed 36,000 people. Santorini Volcano in the Aegean Sea erupted explosively around 1490 B.C., and left a caldera of about 8 by 11 kilometers, over ten times the collapsed volume of Krakatoa. Sea-borne pumice deposits 250 meters above sea level on the nearby island of Anaphi, and an unusual deep-sea deposit tens of meters thick across much of the eastern Mediterranean, have both been attributed to the Santorini tsunami.10 Globally, at least 37 volcanic craters are known to be more than ten times bigger than Santorini and Krakatoa, and many of these are found at, or near sea level.11 Certainly volcanic-collapse generated waves, including some of super-size, played a major role in earth history.

### **Impact-generated Waves**

Craters and suspected craters have been found in continental margins that record at least 18 large asteroid or comet impact events.12 Despite the lack of historical precedent, tsunamis of potentially super-size by impact have occurred in the past. The 90-kilometer-diameter Chesapeake Bay structure lies beneath 400-500 meters of coastal sediments in northeastern Virginia.13 Seismic imagery reveals a near circular crater as deep as Grand Canyon and encompassing an area twice that of Rhode Island. Waters that rushed into this instantly formed crater must have generated outward-bound waves with initial or "primary" heights of up to 500 meters, modeling predicts, which probably put the Appalachian foothills underwater.

Impacts of much larger proportions struck when most of the continent was under water, probably during Noah's Flood.Across a 10,000 square kilometer area in southern Nevada, disrupted limestone blocks and as many as five graded beds occur, as if great tsunamis sorted debris by size.14 The Manson impact structure, located in north-central Iowa, also took place when the continent was underwater, and is associated with a widespread limestone tsunami deposit.15

### **Do Tsunamis Have a Size Limit?**

Life on our blue planet has had to cope with tsunamis of super-size, even in human history. Science has discovered this fact. What is the size limit for tsunamis? An ancient text says, "In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened" (Genesis 7:11). The text provides the date, the duration, the depth and the extent of a seafloor disturbance that began a Flood affirmed to be worldwide by the prophet Moses, the Lord Jesus Christ, and the apostle Peter. If this really happened in the fabric of space-time history, it surely would have created the greatest of tsunamis. As the people of South Asia pick up the pieces from the Indian Ocean catastrophe, perhaps they will discover a new and unique perspective on this passage of Scripture. May they find the Ark of salvation that is in the Lord Jesus Christ.

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Origins Issues

**Origin of the Oceans** (#200503)

by Frank Sherwin, M.S.

***Abstract*** *Do secular scientists have any better ideas today? "The origin of the water in the oceans is unclear" states the University of New South Wales School of Environmental Sciences.*

Secular scientists are unclear as to the origin of anything: the universe, our solar system, the earth, the oceans, or the creatures that inhabit the oceans.

Where did the oceans come from according to evolutionists? Baby boomers may remember this "just-so story" described in the popular Time-Life book series (that includes a veiled swipe at the Biblical explanation while bowing to naturalism).

Finally the day came when the falling raindrops did not hiss away in steam, but stayed to start filling the crevices and corners of the naked planet. Then it rained, and the accumulation of the seas began. The accumulation did not take place (in the opinion of modern geologists) through "the greatest deluge of all time" that has so often been described. *So far as anyone can tell*, it *may* merely have rained as it rains today. Nature has plenty of time. It *probably* took a billion years to fill the oceans[emphasis added].1

Do secular scientists have any better ideas today? "The origin of the water in the oceans is unclear" states the University of New South Wales School of Environmental Sciences.2

For decades many planetary scientists believed that the ocean's water may have come from a rain of comets (so to speak) laden with water. But a 1999 Caltech study by a cosmochemist and his team threw a wet blanket on this theory when they measured significant amounts of "heavy water" (HDO) from the Hale-Bopp comet.3 This type of water contains deuterium, a heavier isotope of hydrogen having one neutron and one proton in the nucleus. If the "oceans-from-comets" theory is correct, our oceans should be deuterium-rich. They are not.

What do creationists say regarding the origin of the oceans? We look to the Biblical model and find that our planet began cool and covered with water (see Genesis 1:2) as opposed to the secular model stating it was molten rock with no water! On the third day of creation, the waters under the heaven were gathered into one place which God called Seas (see Genesis 1:9-10). Centuries later, at the Flood, He again covered the land with water, until the fountains of the deep were closed and the water receded steadily from the earth. As the fountains closed, the ocean floor sank, forming new and much deeper ocean basins (such as the 36,163 foot deep Mariana Trench), permitting the continents to drain and emerge from the waters.

Today's oceans eloquently testify to God's creative power, His judgement at the Flood, and His provision today.

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Dr. John's Q&A

**When Did the Mountains Rise?** (#195)

by John Morris, Ph.D.

***Abstract*** *Catastrophists/creationists consider mountains to be largely the result of Noah's Flood, which first deposited strata, then folded and eroded them, then later still uplifted them into modern mountain chains.*

In geology a controversy prevails concerning uniformity and catastrophe. Regarding mountain building, uniformity maintains that the necessary tectonic forces have always acted, and there should be mountains of every age. Catastrophists/creationists, however, consider mountains to be largely the result of Noah's Flood, which first deposited strata, then folded and eroded them, then later still uplifted them into modern mountain chains. Intense geologic processes were operating at rates, scales, and intensities, far in excess of today's "uniform" norms. Creationists believe some mountains may have risen during the late Flood (for example the Appalachian Mountains), but most mountains (Sierra Nevada, Rocky Mountains, etc.) were elevated in the latest Flood or earliest post-Flood times.\*\* Thus, creationists would expect the world's mountain chains to be among its most recent geologic features.

As can be seen from the following list of data collected from numerous investigators and abridged from a similar chart by evolutionists Ollier and Pain in *The Origin of Mountains*, 2000, pp. 304-306, this expectation has been realized. Keep in mind that in standard evolutionary thinking, which involves billions of years, a few million years is no time at all. Thus, even evolutionists admit nearly all the world's mountains rose just "yesterday" in earth history.

Obviously, this is a "big picture" consideration. Virtually all the mountains of the entire world rose up in the last episode of Earth's geologic history just as expected from creation thinking. Some fine points may await resolution, yet the big picture favors creation.

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| **Mountain Chain/ Plateau/Rift** | **Years Since Main Uplift** |
| **Europe** | |
| Swiss Alps  Apennines Mtns.  Pyrenees Mtns.  Baetic Cordillera  Carpathian Mtns.  Caucasus Mnts.  Ural Mtns.  Sudeten Mtns. | <2 million 1-2 million  2-5 million  2-5 million  2-5 million  <2 million  1-2 million  1-5 million |
| **Asia** | |
| Tibetan Plateau  Himalaya Mtns.  Kunlun Mtns. Tien Shan Mtns. Shanxi Mtns.  Japanese Mtns. Taiwan Mtns. | <3.4 million <3.4 million <4 million <2 million <3 million <5 million <5 million |
| **North America** | |
| Sierra Nevada Mtns.  Main Colorado Plateau  Bighorn Mtns.  Rocky Mtns.  Canadian Cordillera  Cascade Range | <2 million  <3 million <3 million <5 million 2-5 million 4-5 million |
| **South America** | |
| Chilean Andes  Bolivian Andes  Ecuadorian Andes | <5 million  <5 million  <5 million |
| **Africa** | |
| Ethiopian Rift  Western Rift  Ruwenzori Mtns. | <2.9 million <3 million  <3 million |
| **Other** | |
| New Guinea Mtns.  New Zealand Mtns. | 2 million  <5 million |

\*\* Scripture affirms that the waters once "stood above the mountains" (Psalm 104:6), then retreated (v.7), and then the mountains rose and the valleys sank (v.8).

Dr. John's Q&A

**What Came First, the Chicken or the Egg?** (#193)

by John Morris, Ph.D.

***Abstract*** *Chickens are amazingly complex creatures, with their hollow bones, intricate feathers, four-chambered heart, continuous air intake, high metabolism, complex brain, good hearing, superb color vision, etc. Everything about a chicken suggests careful design.*

This age-old question really has a simple answer. Attempts to answer it, however, and attempts to get around implications of the simple answer are often quite convoluted.

According to the Creator of chickens, and the author of the Record of their origins, chickens came first. It was on the Fifth Day of Creation Week that He created "every winged fowl after [their] kind" (Genesis 1:21) complete with the DNA to reproduce that kind. Then He "blessed them, saying, Be fruitful, and multiply" (v.22) using that DNA. For the chickens this meant lay chicken eggs. Problem solved.

Chickens are amazingly complex creatures, with their hollow bones, intricate feathers, four-chambered heart, continuous air intake, high metabolism, complex brain, good hearing, superb color vision, etc. Modern domestic chickens aren't very good flyers, having been bred to stay home, but neither were the recently wild forefathers of chickens from which they were bred. Everything about a chicken suggests careful design.

Even a chicken's egg is well designed. The embryo nestles safely inside, surrounded and cushioned by amniotic fluid and nourished by the yolk. Metabolic wastes are insulated from the rest, while oxygen and carbon dioxide are exchanged across the hard but porous shell.

A healthy female chicken produces just such a system nearly once a day, and can even preserve male sperm inside her body to continue fertilizing eggs for several days after mating. The creationist can clearly see the Creator's hand in each feature, phase, and function of both chicken and egg.

The evolutionist has a different story to tell, however. To them, chickens evolved from other kinds of birds, although which ones remains unclear. It wasn't flightless birds which gave rise to chickens, because they are thought to have descended from birds which could fly but lost that ability through mutation. Actually, the origin of all types of birds which live today are shrouded in mystery leading bird expert, Alan Feduccia, to proclaim, "The origin of birds is still up in the air."

It's fashionable today to claim that birds evolved from dinosaurs, although again, there is little agreement on which dinosaur lineage was ancestral to birds. The claim persists in spite of the fact that birds and dinosaurs differ markedly. Legs must become wings and scales must become feathers. Dinosaurs had solid bones, yet bird bones are hollow. Reptilian dinosaurs were likely cold blooded while birds are warm blooded with an extremely high metabolism. Dinosaurs had lungs similar to mammals, while the bird's breathing scheme is totally different. At least dinosaur eggs were similar to birds eggs internally. Externally, they had a soft, leathery shell quite different from bird's eggs.

All of these changes are thought to have been accomplished by acquiring new genetic information through random mutation. Did the mutations occur in the adult progenitor of chickens or in its eggs? There is no evidence of either.

A more interesting question arises. Which came first—the commitment to naturalistic evolution and the necessity that animals arose from different animals, or the data to support it?

Origins Issues

**Ammonite Evolution?** (#200412)

by Frank Sherwin, M.S.

***Abstract*** *Creation scientists see ammonites as always having been ammonites, complete with their intricately working parts.*

"Cephalopods of Subclass Ammonoidea and especially the Mesozoic forms known in the vernacular as 'ammonites' are amongst the most abundant and well known of all fossils."1 Ammonites were a subclass of cephalopods (squid, octopus) with coiled shells, complex sutures (lines of fusion), and septa (a partition or wall between two cavities). Fossilized remains of ammonites may be found in virtually every country in sizes ranging from nine feet across to less than a half an inch. Ammonites may have been the favorite food2 of the marine reptile called the plesiosaur. The ammonites were free-swimming creatures (called nekton) of the open ocean, falling prey to plesiosaurs as they cruised the seas both before and during the Flood. According to secular science, the ammonites became extinct along with the dinosaurs 65 million years ago. But what of their *origin?* Were they created or did they evolve from an unknown non-ammonite ancestor?

Creation scientists see ammonites as always having been ammonites, complete with their intricately working parts. Evolutionists are puzzled by their regularly coiled shells,3 certainly not a problem for the creationist. Is there variation among these creatures? Certainly, within the created ammonite kind. For example, ammonites—big or small—are found in the fossil record from the Early Devonian to the Upper Cretaceous, but always as ammonites. The sutures in the shells were found to be more elaborate in the Late Paleozoic and Mesozoic, but there is no significant change. There are no intermediate or part-way ammonite forms in the fossil beds—no unambiguous line of evolutionary descent. For example, non-creationist Richard Milton writes of a hundred-foot section of clay in Folkestone, England, containing ammonites:

Museums and private collections are full of them, preserved in beautiful detail including an iridescent pearly shell. They come from a section of clay perhaps 100 feet high, which presumably, in uniformitarian terms, represents millions of years of sedimentation. Yet among the tens of thousands of specimens dug up by collectors, no one has ever found a specimen that is part way between *Hoplites dentatus* and *Euhoplites lautus* or between *lautus* and *Mortoniceras inflatum*—or between any of the fourteen different ammonites.4

Here's the point. When one searches through specific sections of the sedimentary rock, no evidence of macroevolution is found, be they ammonites or people. Furthermore, the complexity of these creatures doesn't match the Darwinist prediction that states they should become more complex as one goes up the sedimentary rock layers.5 One reads of ammonite extinctions (e.g., *BioScience,* v. 52, no. 5, p. 446) which fits well with the creation/Flood model, but virtually nothing of their *origin* (macroevolution).

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Dr. John's Q&A

**Are Fossils The Result of Noah's Flood?** (#191)

by John Morris, Ph.D.

***Abstract*** *Most fossils occur in huge fossil graveyards where things from different habitats are mixed together in a watery grave.*

Fossils have been frequently cited as the main evidence for evolution. The evolution/uniformitarian worldview postulates that the slow and gradual processes we see operating today are responsible not only for the death and extinction of plant and animal types but their burial in sediments which will eventually harden into sedimentary rocks. Uniformity’s slogan, “the present is the key to the past,” reflects their view of the origin of the fea- tures in the rock and fossil record. I think the great Flood of Noah’s day is a better explanation.

First note that very few fossils are forming today and then only in the case of rapid burial by water. For instance what happens to a fish when it dies? It either floats to the surface or sinks to the bottom where it decays and is eaten by scavengers. Yet many fish fossils are so exquisitely preserved that even the scales and organs are preserved. Obviously there was no time for decay and bacterial action. We can certainly say that something extraordinary happened to form the fossils.

Furthermore, most fossils occur in huge fossil graveyards where things from different habitats are mixed together in a watery grave. The predominant type of fossil is that of marine invertebrates but these are found on the continents within catastrophically deposited rock units.

Of the several different kinds of fossils, each one requires rapid burial and circumstances which are seldom, if ever, at work today. Processes of fossilization include:

*Mineralization*: This happens by partial or entire replacement of an organism by minerals, usually one molecule at a time as the organism decays. Time is involved but not time before burial. Petrification occurs when the replacing mineral is silica.

*Carbonization*: Living things consist of high carbon content, and under extraordinary circumstances only the carbon remains. This includes the thick coal bands as well as thin carbon residues left in the host rock. Rapid isolation and heating is required.

*Impressions*: These common fossils occur when the entire organism is replaced by the same material as the host rock leaving only the form of an organism. The detail preserved indicates no time for decay.

*Ephemeral markings*: These common markings include worm burrows, animal tracks, coprolites, and rain-drop impressions. All are extremely fragile and need rapid lithification to be preserved.

*Hard parts:* Bones and shells are found but these are usually broken. For instance, limbs ripped from dinosaurs, found in fossil graveyards, are the rule.

*Soft parts*: Obviously these will only last for a very short time without rapid burial. These include flesh, feathers, skin, scales, plant tissue, color, and even smell.

*Frozen parts*: These imply extremely low temperatures which trapped and froze the organisms quickly. Certainly this is not happening now on any scale.

These fossil types (and other subcategories could be mentioned) require extraordinary circumstances of a rapid and catastrophic nature. The great Flood of Noah’s day which destroyed a world full of life is the best explanation.

Dr. John's Q&A

**How soon after the flood did the earth return to equilibrium?** (#190)

by John Morris, Ph.D.

***Abstract*** *During the Flood the earth --??broke--?? and geologic processes happened rapidly.*

In the original creation the earth was deemed “very good” (Genesis 1:31). Soon Adam and Eve rejected God’s authority and incurred the great curse of Genesis 3:14–19, which affected all of creation (Romans 8:20–22). This led to the great Flood of Noah’s day which fully altered all aspects of Earth’s once “very good” status.

While the Bible doesn’t give us all the details, we get the impression that before the curse there were no storms, no earthquakes, no landslides, etc. Even after the curse, but before the Flood, these would have been minimal. However, during the Flood the earth “broke” and geologic processes happened rapidly. Indeed, the entire surface of the earth was restructured by the waters of that great Flood.

Today we live once again in a world of relative equilibrium. We now experience earthquakes, hurricanes, tidal waves, and volcanoes, but to a much lesser degree than occurred during the Flood. Those early centuries after the Flood thankfully saw the devastation taper off but I suspect it took several hundred years for the earth to regain the relative equilibrium that we enjoy.

Today our weather patterns are influenced by the jet streams, huge currents of air at high altitudes. These probably took quite some time to be reestablished. Weather patterns are likewise controlled by ocean temperatures, the warmer the oceans the more evaporation, and the more precipitation. Creationists suspect that the “Ice Age” was a direct result of the great Flood due primarily to the heating of the oceans by the fountains of the great deep, which erupted during the Flood. Modern speculation that global warming will cause an Ice Age (although largely misguided) mirrors this creationist theory. Such dynamic weather patterns would have continued until the oceans gave up their excess heat.

We also see in the centuries following the Flood that volcanism occurred on a scale dwarfing anything that we see today. Consider that as the Flood ended, the continents were rising and spreading, and the ocean basins sinking, giving rise to immense fractures in the earth’s crust. Volcanic aerosols in the atmosphere would have contributed to the Ice Age, shielding the earth from much of the solar radiation that we now receive, thereby cooling the continents and allowing snow to build up into great ice sheets.

As the continents rose and split, mountain chains buckled up, further influencing our weather patterns. No doubt the weather was quite violent and unpredictable for several hundred years until things stabilized, and earthquakes were a common occurrence. There may have been a reason that the early peoples lived in tents and not buildings.

Creationists have come to call this post-Flood period one of “residual catastrophism” which would have continued through the time of the Tower of Babel and into Abraham’s day. Today we live in a relatively stable world, but still a world reeling from the effects of the great Flood. Thankfully one day there will be a new heaven and a new earth where catastrophes will not even be remembered.

Dr. John's Q&A

**What Geologic Processes Were Operating During the Flood?** (#189)

by John Morris, Ph.D.

***Abstract*** *This was a special rain for forty days and forty nights but it continued for a hundred and fifty days, through the first half of the Flood.*

The great Flood of Noah's day was a time of unthinkable geological upheaval, such that "the world that then was, being overflowed with water, perished" (II Peter 3:6). No flood in human history has rivaled its destructive magnitude.

Though we are far from a full understanding of the Flood, the Bible does give us a clue when it says, on that "same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights" (Genesis 7:11\_12). Geologists note three succinct mechanisms which God used that bear our consideration.

The trigger for the rest was that "all the fountains of the great deep" were ruptured. The fountains may have been underwater volcanos or materials from deep inside spewing out into the ocean basins.

Evidently there were great subterranean chambers of water which belched forth their contents causing volcanism and tectonism on a broad scale. After being emptied some collapsed to become deep sedimentary basins which uplifted later in the Flood to form mountain chains.

Today when a volcano erupts under water, or if there is an underwater earthquake or mud slide, it causes a *tsunami* or tidal wave; a dynamic energy wave which pushes water toward the continents, devastating coastal areas. At the start of the Flood *all* the fountains of the great deep were rent open sending repeated pulses of water toward the continents from every direction bringing sediments and marine fossils to the land. Cyclic ocean currents and tidal actions would have left their imprint on these sediments.

Along the mid-ocean ridges once molten rock and other super hot fluids would have encountered the relatively cold ocean waters, evaporating huge volumes of sea water, ultimately yielding intense rainfall and precipitating their dissolved solids.

Torrential rain poured down. This was a special rain for forty days and forty nights but it continued for a hundred and fifty days, through the first half of the Flood. This continually replenished source of water would have bombarded the earth, eroding and redepositing sediments on a global scale.

For the next six months, the waters "prevailed" (7:18) upon the earth with water driven back and forth on the world oceans. Tides were unchecked by shorelines and until the fountains were stopped and the flood gates closed (8:2\_3) any unstable deposit would be susceptible to reworking in a high energy environment.

Finally, six months after the start of the Flood, the waters "returned from off the earth" (8:3). They "decreased continually" for the next several months until the tops of the mountains were seen (v.5) exposing and drying the land, making it fit for life. This implies both continental uplift, ocean basin sinking, and sea floor spreading. This redistribution of the topography implies extensive deformation of soft, freshly deposited sediments. A great wind aided this drainage (8:1).

The Flood was unmatched by any event in our experience, yet both Scripture and science demands it. Any attempt to reconstruct earth history which ignores the Genesis Flood is certain to be in gross error.

Dr. John's Q&A

**Were the Huge Columbia River Basalts Formed in the Flood?** (#185)

by John Morris, Ph.D.

***Abstract*** *Reasoning from the Scriptural record, I "predict" that when we examine the geologic results of the Flood, we will see that the geologic strata were deposited by catastrophic processes, operating on a regional scale.*

Often skeptics of creation/flood/young earth thinking scoffingly claim that no evidence for the Flood exists. Even though most geologists have abandoned old-style uniformity in favor of a grudging acceptance of major catastrophism, they still deny the global, year-long, cataclysm of Noah's day described in Scripture. I like to ask them, "What sort of evidence would you be prepared to accept? Obviously, we can't observe that past event, but if such a world-restructuring flood occurred, what would you expect to result from it?" For most skeptics, no evidence would persuade them. Their rejection of the Noahic Flood, as an outworking of God's holy wrath on sinful men, is for philosophical reasons—"religious" reasons, irrespective of scientific evidence.

When considering non-repeatable events of the past, we are limited to scientific "predictions," not predictions of the future, but predictions of the evidence. Reasoning from the Scriptural record, I "predict" that when we examine the geologic results of the Flood, we will see that the geologic strata were deposited by catastrophic processes, operating on a regional scale. These large-scale results would dominate the rock record. My uniformitarian colleagues would predict the record would be dominated by the rather slow and gradual geologic processes possible today, operating on a local scale. Once both sides have made their predictions, the evidence can be evaluated as to which one is the better fit. That one is more likely correct.

Consider the Columbia River Basalt Group of lava flows in Washington, Oregon, and Idaho. This series of lava flows was stacked one on top of another in rapid succession and covers an area of some 65,000 square miles and with a volume of about 40,000 cubic miles. This dwarfs the largest historic lava flow, which occurred in Iceland in 1783, and covered an area of about 200 square miles with a volume of less than 3 cubic miles. One can scarcely envision such eruptions, producing a veritable "lake of lava" thousands of times larger than anything witnessed by modern men. The molten material flowed from several locations along linear cracks in the earth's surface, but even this deposit is dwarfed by other much larger basalt deposits which have been recognized.

Occurring in layers stratigraphically below the Columbia River Basalts are thick layers of water-deposited, fossil-bearing, sedimentary rock, obviously deposited by the Flood itself. Thus, Flood advocates interpret these mega-eruptions of basalt as probably occurring during the very last stages of the Flood or in the years of readjustment to follow, as Earth's systems regained the relative equilibrium in which we now find them. Surely this was a fearful time.

Obviously such large-scale volcanism does not match uniformitarian predictions regarding the past. Yet it does match the creation/flood/young earth prediction of catastrophic processes operating on a regional scale during and immediately following the Flood. While neither side can directly observe the past, the Biblical, "Back to Genesis" model is the one that predicts the evidence, and, is thus, from a scientific perspective more likely correct.

Impact

**Dinosaur National Monument: Jurassic Park Or Jurassic Jumble?** (#370)

by William Hoesch, M.S.

***Abstract*** *On the heels of the American "dinosaur rush," Earl Douglass in 1909 discovered eight articulated brontosaur tail vertebrae, standing out in relief from a sandstone ridge in eastern Utah.* 

More than one thousand large fossil bones stand out in bold relief upon the rock wall at the Quarry Visitor Center in Utah's Dinosaur National Monument. The first-time visitor is stunned by the magnitude of the exhibit. The quarry face (known best as "The Wall") is surely the finest on-location dinosaur display in the world. This tangled knot of dinosaur bones represents a classic "mass burial" deposit, a trademark of what geologists call the Morrison Formation. Extending from New Mexico to Canada, the Morrison Formation covers about 700 thousand square miles and has been assigned to the Jurassic System. How did such a burial take place? We seek to find the real significance of the deposit at Dinosaur National Monument (DNM) and to dispel myths that our culture has delivered to us.

### **History of "The Wall"**

On the heels of the American "dinosaur rush," Earl Douglass in 1909 discovered eight articulated brontosaur tail vertebrae, standing out in relief from a sandstone ridge in eastern Utah. As digging began, he was shocked at how the skeletons turned up, literally one on top of another, and how the smaller stegosaurs "got in the way" of the prized sauropods.1 The sedimentary rock package containing the bones can be called the "Quarry sandstone," a lens-shaped pebbly sandstone up to 50 feet in thickness that is exposed for 3,000 feet along the ridge outcrop. The Quarry sandstone is composed chiefly of chert and tuff grains.2 Volcanoes certainly supplied the tuff grains, and perhaps the chert pebbles as well. It is part of the overall 470-foot-thick Brushy Basin Member of the Morrison Formation that is dominantly mudstone. No less than a dozen well-articulated sauropods were excavated over a 15-year period ending in 1924. Probably none was more famous than the original *"Brontosaurus"* excavated by Douglass, that remains the most complete ever found, and that has stood in Pittsburgh's Carnegie Museum since 1915. The Quarry Visitor Center was opened officially to the public in 1958. Popular caricatures about dinosaurs can now be compared with the stark reality of the deposit itself, in an exhibit that is without parallel in the world.



### **The Jurassic Park caricature**

Of all the popular images of dinosaurs, perhaps none has been so compelling as the one featured on the front cover of *Life Magazine* over 50 years ago.3 The magazine displayed *Brontosaurus*, the snub-nosed sauropod, half-floating in the waters of a swamp and lazily munching on its lush vegetation. The artwork was derived from the Yale Peabody Museum's mural painted by artist Rudolf Zallinger after six-months of consultation with the world's top geologists.4 It had been considered fact, not speculation, that the mural and magazine cover accurately represented the world in which *Brontosaurus* lived 150 million years ago. Because the purpose was to depict "The Age of Reptiles," mammals do not appear. The image became an icon so compelling that even a U.S. postage stamp bore its likeness. The image was derived, in a major way, from the deposit visible at the Quarry Visitor Center.

Today, this "Jurassic Park" caricature can be regarded as twentieth-century folklore. *Brontosaurus*, the icon that stood for at least two generations, underwent an extreme makeover in the 1970s, to correct two mistakes made much earlier. The result was a new name, *Apatosaurus,* and a radically different head with a long-snouted and delicate look.5 Almost all geologists familiar with the Morrison Formation question the swamp image, and some call it "heresy."6 The contention that waters were somehow needed to buoy the giant herbivores is also discounted. The image that these were slothful, stupid, and lumbering beasts was revised with new evidence leading some to suggest warm-bloodedness. Sedimentary evidence indicating bone transport means that we see the dinosaur burial site today, not the "park" in which they lived. Mammals are not depicted in "The Age of Reptiles" icon, but mammal *fossils* are well represented in the Morrison Formation at DNM.7 Finally, the age for the deposit has been "adjusted" so many times over the last 80 years that there is little reason for confidence that the currently accepted age is the correct one.8 

Thus, the image that had been so widely embraced by the public involved a largely fictional animal in the fictional waters of a fictional swamp during a fictional age. *This was the original Jurassic Park, concocted not by Hollywood, nor by creationists, but by the very scientific leaders, museum curators, and government administrators who were most familiar with the DNM deposit.*

### **Six facts regarding the Dinosaur National Monument deposit**

We need to get the real story for the Quarry Visitor Center deposit. Recognizing the facts is important because they help us get beyond the cultural baggage and icons to develop a deeper understanding.

***Fact #1*: The most common fossil in the Quarry sandstone is not the dinosaur, but a group of clams, of the genus *Unio***.9Nearly identical forms of this clam thrive today in nonturbid and perennial fresh waters. This clam, known for a weak hinge joining its two shells, normally comes undone within days of the creature's death.10 Fossil clams at DNM are mostly disarticulated, and obviously were transported along with the big sauropod bones and other debris. Some of the loose shells are stacked, or imbricated, in a preferred west-to-east direction. Others, less commonly, are found in articulated form, that is, with the two matching shells closed and intact. These articulated clams are not in natural growth position, but represent a "transported death assemblage." In other words burial was the cause of death.11 The equivalent sedimentary layers near Grand Junction, Colorado, display a multitude of unionids, all articulated, that are recognized as having been "buried alive during an episode of rapid sedimentation."12 That something similar happened at DNM is almost inescapable. The numbers of these clams, and their manner of burial, remind us that the real story at DNM is first and foremost, one of death, transport, and rapid burial.  
  
***Fact #2*: The original Brushy Basin deposit was dominated by silica-rich volcanic ash representing explosive volcanism on a colossal scale.** Three products of explosive volcanoes dominate the Brushy Basin Member: (1) discrete tuff beds up to 20 inches thick containing up to half-inch-diameter volcanic fragments accumulated from air-fall ash,13 (2) reddish or greenish, fine-grained, altered volcanic ash redeposited by water in massive beds,14 and (3) pebbles of volcanic tuff and chert some over one inch diameter dispersed through the water-worked sandstone. Montmorillonite, the kind of clay formed by alteration of volcanic ash, alone accounts for over 50% of the 470-foot-thick Brushy Basin Member at DNM.15 A staggering quantity of volcanic materials, estimated at more than 4,000 cubic miles,16 occurs within the thin but widespread Brushy Basin Member in Wyoming, Utah, Colorado, New Mexico, and Arizona. No volcano is known within the boundary of the Morrison deposit, no local lava flows are known within the Morrison boundary, and geologists place the nearest explosive volcanic source vents in southern California or Nevada.17 How these coarse volcanic materials in such colossal quantities were distributed on so wide a scale remains a mystery. Imagine an exploding volcano in southern California that rained half-inch-diameter pumice and lapilli fragments on Utah and Colorado. That would be a most extraordinary eruption.

***Fact #3*: Fossils from the DNM quarry represent a water-transported and processed assemblage, not an *in situ* ecosystem.** We need to dispel the image of a calm and serene park for the Quarry sandstone. The remains of whole dinosaurs, unionid clams, snails, logs, and wood fragments from the Quarry sandstone all testify to some degree of transport. The more easily transported bones like ribs and phalanges are under-represented compared to less-easily transported items like femurs, which suggests the winnowing action of water. The majority of dinosaur skeletal items were buried while articulated or closely associated with a parent carcass, including some nearly complete carcasses that came to rest in stiff *rigor mortis* positions.18 The dismembered carcasses certainly contained tissue adhering to bone at the time of burial. Quarry invertebrates include not only the unionid clams, but also two genera of gill-breathing snails from the prosobranch family.19 Modern snails from this family, that are nearly identical to these fossil forms, require in their life-cycle waters that are (1) perennial, (2) well-oxygenated, and (3) low in turbidity. Such conditions could hardly have been met during deposition of the Quarry sandstone bed, much less the overall Brushy Basin Member. This enigma has been called "the Morrison gastropod problem."20 The snails must also be regarded as part of the death assemblage. The fact that *all* of these fossil types were selectively sorted during transport from an unknown distance before burial makes very difficult the job of reconstructing an ancient "ecosystem." 

***Fact #4*: The agent that transported the clams, carcasses, clay, snails, sand, and pebbles was itself a most extraordinary sedimentary process.** At the DNM quarry, the bones are found in three distinct intervals within the 50-foot-thick, channel-shaped Quarry sandstone. The three sandstone "channels" scour into the surfaces beneath, and experts have struggled to imagine the kind of "rivers" that each of the channels represent. The notion taught for decades at the Quarry Visitor Center by DNM rangers, that dinosaurs were washed up on a point bar along the bank of a meandering river, is now discredited.21 Bones are especially concentrated in the bottoms, not the sides, of the scour channels. The sand grains and pebbles in the sandstone are dominantly composed not of quartz, the typical river sediment, but of altered tuff and chert fragments of probable volcanic origin. The lowest of the three levels, where dinosaur bones are most abundant, contains isolated larger pebbles dispersed in a sandy matrix, a texture unlike that of normal rivers. The texture and composition of the lower interval suggests deposition from a muddy suspension, not normal bedload transport in a river. Mudflows associated with catastrophic floods during the recent eruptions at Mount St. Helens volcano produced fluidized sediment slurries in wide river valleys and deposited similar textures.22 The upper two intervals of the Quarry sandstone, where dinosaur bones are less abundant, have noteworthy scour surfaces with cross beds of sand and pebbles indicating eastward transport of muddy and sandy sediment over large dune structures by very fast water currents. We can imagine dinosaur carcasses suspended buoyantly in a denser-than-water flow. How far they floated is unknown, but the process of suspension may have not been very abrasive. Clams, snails and logs were also moved with the volcanic pebbles and carcasses within the slurry. As deposition of sediment and carcasses occurred, the remaining flow became enriched in water going from a muddy, slurry suspension current to a less-muddy traction current. The deposit itself gives us an impression of a very catastrophic water-burial event. 

***Fact #5*: Food requirements for the giant herbivores imply abundant vegetation, yet fossil evidence for localized swamps, or for *in situ* flourishing of plants, is scant to nonexistent.** A large herbivore like *Apatosaurus* would need to eat more than a ton of green fodder each day in order to survive. Large numbers of dinosaurs imply enormous food reserves in the form of plants. However, paleontologists are baffled by the rarity of fossil plants: "Although the Morrison plain was an area of reasonably rapid accumulation of sediment, identifiable plant fossils are practically nonexistent."23 Transported logs occasionally occur in sandstone channels within the Morrison, but rooted soil zones with upright *in situ* stumps have not been reported, even though they are potentially the most fossilizable features in a volcanic terrain. Even fossil spores and pollen, the most durable traces of plants, are in very short supply.24 The enigma of the missing plant fossils might be answered by supposing that dinosaurs migrated routinely into a very arid plain where alkaline flats prevented plant growth. The bizarre notion of an "incomplete ecosystem" within a "Jurassic Desert" is a radical departure from the lush and balanced habitat of the elusive "Jurassic Park." Another explanation for the noteworthy deficiency of plant fossils, especially in the face of the sedimentary evidence at the Quarry Visitor Center, is that the flood transportation and deposition process selectively separated the dinosaurs from plants (i.e., sorting of "highly displaced" organisms). 

***Fact #6*: The "mass accumulation" of dinosaur bones at DNM, a sort of trademark feature for the Morrison Formation in the American West, represents a mystery that lacks satisfactory explanation.** About 20 such extraordinary bone quarries exist, separated by vast reaches that are relatively devoid of bones. The lowest of the three bone-bearing intervals within "The Wall" at the visitor center represents the highest bone concentration, a packing of 2.9 bones per square meter.25 As visually stunning as this is, other large dinosaur quarries in the Morrison have bone packing that is over ten times this value. The rock types in these various quarries are quite variable, but the entombed dinosaur taxa are incredibly similar, even though the Morrison Formation covers a 700-thousand-square-mile area. So uniform are the taxa that frustrated evolutionists agree, "We failed to find any convincing evidence of evolution at the generic level within the Morrison Formation."26 These massed accumulations, of which DNM is the most famous example, remain a geologic mystery.

### **Conclusion**

It is difficult to escape the conclusion that something extraordinary took place at Dinosaur National Monument. The deposit indicates enormous volcanoes, a suspension means of transport, multiple kinds of death assemblages, and a host of paleoenvironmental problems. Yet, DNM is only one of many dinosaur-massed assemblages. The above six points are hardly debatable, but are very much understated. Why does the public not receive frequent reminders of the facts so obvious within "The Wall" at DNM? Why does a coherent dinosaur "environment" seem so elusive? "Jurassic Park" is too peaceful a picture here. Clams, snails, and dismembered dinosaurs within the same deposit demonstrate a watery catastrophe. "Jurassic Jumble" is more appropriate.

### **Endnotes**

1. Chure, D., and West, L., 1994, *Dinosaur: the Dinosaur National Monument Quarry:* Vernal, Utah, Dinosaur Nature Association, 40 pp.

2. Turner, C., and Peterson, F., 1992, *Sedimentology and Stratigraphy of the Morrison Formation in Dinosaur National Monument, Utah and Colorado:* Annual Report of the National Park Service (unpublished), contract #CA-1463-5-0001, in cooperation with the U.S. Geological Survey, 80 pp.

3. *Life Magazine*, September 1953.

4. Zallinger's famous mural was painted under the supervision of Yale geologist and museum director Carl O. Dunbar with Harvard and Yale scientists tutoring him for six months prior to commencing the mural. The mural is known to have inspired a new generation of paleontologists.

5. Douglass identified the correct diplodocus-like skull for his sauropod, but was overruled by his supervisors at Carnegie Museum who deferred to an earlier, incorrect, precedent. Thus, "the size, shape, and features of the *Apatosaurus* head were disputed for over a century" (*Encyclopaedia Britannica*, 1986).

6. Bakker, R., 1986, *The Dinosaur Heresies: New Theories Unlocking the Mystery of the Dinosaurs and their Extinction:* New York, William Morrow, 482 pp.

7. Engelmann, G., and Callison, G., 1998, Mammalian faunas of the Morrison Formation: *Modern Geology*, vol. 23, pp. 343-380.

8. A claystone very near the top of the Quarry sandstone at DNM that yielded a 135.2 ± 5.5 Ma K-Ar date in 1986, gave a 152.9 ± 1.2 Ma Ar-Ar date in 1991 (Kowallis, B., et al., 1991, Age of the Brushy Basin Member of the Morrison Formation, Colorado Plateau, Western USA, *Cretaceous Research*, vol. 12, pp. 483-493). The age of the Morrison Formation has been "the chief point of dispute" for over 70 years as of 1944 (Stokes, W., 1944, Morrison Formation and related deposits in and adjacent to the Colorado Plateau: *Geological Society of America Bulletin*, vol. 55, pp. 951-992). As of 1998, "one of the significant unresolved problems related to the Morrison Formation is its age, both chronostratigraphically and biostratigraphi-cally" (Kowallis, B., et. al., 1998, The isotopic age of the Morrison Formation in the western interior; final report: *in*, C. Turner and F. Peterson, eds., *Final Report: The Morrison Formation Extinct Ecosystems Project*: unpublished report, in cooperation of the National Park Service and the U.S. Geological Survey, pp. 167-200).

9. Chure and West, op. cit.

10. Cummins, R., 1994, Taphonomic processes in modern freshwater molluscan death assemblages: implications for the freshwater fossil record: *Palaeogeography, Palaeoclimatology, Palaeoecology*, vol. 108, pp. 55-73.

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12. Evanoff, E., Good, S., and Hanley, J., 1998, An overview of the freshwater mollusks from the Morrison Formation (Upper Jurassic, Western Interior, USA): *Modern Geology*, vol. 22,  
pp. 423-450.

13. Turner, C. and Fishman, N., 1991, Jurassic Lake T'oo'dichi': a large alkaline, saline lake, Morrison Formation, eastern Colorado Plateau: *Geological Society of America Bulletin*,  
vol. 103, pp. 538-558.

14. Wahlstrom, E., 1966, Geochemistry and petrology of the Morrison Formation, Dillon, Colorado: *Geological Society of America Bulletin*, vol. 77, pp. 727-740.

15. Bilbey, S., 1992, Stratigraphy and sedimentary petrology of the Upper Jurassic-Lower Cretaceous rocks at Cleveland-Lloyd Dinosaur Quarry with a comparison to the Dinosaur National Monument Quarry, Utah: Ph.D. dissertation, University of Utah, 280 pp.

16. Area of Brushy Basin volcanics exceeds 120,000 square miles in eastern Utah, northeastern Arizona, northern New Mexico, western Colorado, and southern Wyoming. Thickness of volcanics averages about 200 feet through this area. Therefore, volume of volcanics is at least 4,300 cubic miles.

17. Christiansen, E., Kowallis, B., and Barton, M., 1994, Temporal and spatial distribution of volcanic ash in Mesozoic sedimentary rocks of the western interior: an alternative record of Mesozoic magmatism, *in*, M. Caputo, F. Peterson, and K. Franczyk, eds., *Mesozoic Systems of the Rocky Mountain Region, USA*: Denver, Rocky Mountain Section SEPM (Society for Sedimentary Geology), pp. 73-94.

18. Lawton, R., 1977, Taphonomy of the Dinosaur Quarry, Dinosaur National Monument: *Contributions to Geology, University of Wyoming,* vol. 15, no. 2, pp. 119-126.

19. Evanoff, E., et. al., 1998, op. cit., and Yen, T., 1952, Molluscan fauna of the Morrison Formation, *United States Geological Survey Professional Paper* 233-B, pp. 21-55.

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25. Dodson et. al., op. cit.

26. Dodson et. al., op. cit.

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Dr. John's Q&A

**Did Noah's Flood Cover the Himalayan Mountains?** (#177)

by John Morris, Ph.D.

***Abstract*** *The Flood didn't have to cover the present Earth, but it did have to cover the pre-Flood Earth, and the Bible teaches that the Flood fully restructured the earth.*

Few doctrines in Scripture are as clearly taught as the global nature of the Great Flood in Noah's day. Genesis clearly teaches that *"the waters . . . increased greatly . . . and the mountains were covered"* (Genesis 7:18-20).

Through the centuries, few Christians questioned this doctrine. The Bible said it, and that was enough—until the late 1700s that is. For the first time the globe was being explored—the extremely lofty Himalayan Mountains were surveyed, capped by Mt. Everest at 29,035 feet in elevation. Did the waters cover them? Is there enough water on the planet to do so? The questions seemed so far-fetched that many European churchmen dismissed the idea that the Flood was global, adopting the local flood concept which still dominates Christian colleges and seminaries today. Like dominos, other doctrines soon began to fall—the young age for the earth, the special creation of plants and animals, and the inerrancy of Scripture.

We now know, of course, that the earth has plenty of water to launch a global flood. It has been calculated that if the earth's surface were completely flat, with no high mountains and no deep ocean basins, that water would cover the earth to a depth of about 8,000 feet. But is there enough water to cover a 29,035 foot mountain?

The key is to remember that the Flood didn't have to cover the present Earth, but it did have to cover the pre-Flood Earth, and the Bible teaches that the Flood fully restructured the earth. *"The world that then was, being overflowed with water, perished"* (II Peter 3:6). It is gone forever. The earth of today was radically altered by that global event.

That Flood accomplished abundant geologic work. Eroding sediments here, redepositing them there, pushing up continents, elevating plateaus, denuding terrains, etc., so that the earth today is quite different from before. Today even mountain ranges rise high above the sea.

Mt. Everest and the Himalayan range, along with the Alps, the Rockies, the Appalachians, the Andes, and most of the world's other mountains are composed of ocean-bottom sediments, full of marine fossils laid down by the Flood. Mt. Everest itself has clam fossils at its summit. These rock layers cover an extensive area, including much of Asia. They give every indication of resulting from cataclysmic water processes. These are the kinds of deposits we would expect to result from the worldwide, world-destroying Flood of Noah's day.

At the end of the Flood, after thick sequences of sediments had accumulated, the Indian subcontinent evidently collided with Asia, crumpling the sediments into mountains. Today they stand as giants—folded and fractured layers of ocean-bottom sediments at high elevations. No, Noah's Flood didn't cover the Himalayas, it formed them!

Thus we find the Biblical account not only possible, but also supported by the evidence. A pre-Flood world with lessened topographic extremes could have been covered by the Great Flood. That Flood caused today's high mountains and deep oceans making such a flood impossible to repeat. This is just as God promised, back in Genesis.

Impact

**Sea Dragons** (#362)

by Mace Baker

***Abstract*** *The Scriptures indicate very clearly that sea dragons were part of the original creation and are mentioned as being alive and flourishing even after the time of Noah's flood. For instance, in Psalm 74:13 we read, "Thou didst divide the sea by thy strength: thou brakest the heads of the dragons in the waters."*

For more than a thousand years ancient and medieval mariners often returned from their voyages with frightening tales of encounters with, or sightings of, large and dangerous sea monsters. These were amazing creatures, not only because of their size and ferocity, but also because they would at times break the surface of the water, indicating that they were actually air breathers. This, along with their unique anatomy, made it clear that these strange creatures were not a species of fish. It was soon recognized that they were some kind of unusual marine reptile. Consequently, they were often referred to as sea dragons. As time went by, fewer and fewer of these unique and fearsome creatures were seen. Eventually there were only the stories from olden days. Finally the stories themselves began to lose their credibility and were relegated to the realm of legends or mythology.

However, in the 1800s a young English girl, Mary Anning of Lyme Regis, England, discovered the fossil remains of some strange and very ancient marine animals. The pay she received from various paleontologists motivated her to keep looking. She found so many that she actually was able to make a living from the discovery and sale of these fossils. In time the fossils she found received their modern names of ichthyosaurs, meaning "fish lizards," and plesiosaurs, meaning "near lizards."

Since that time, hundreds of articulated ichthyosaur skeletons have been found, making it possible for us to know a good deal about these marine creatures. The first scientist to describe ichthyosaurs was Dr. William Buckland, professor of Geology at Oxford. Dr. Buckland had respect for God as Creator and spoke of the various unique aspects of the ichthyosaurs within the framework of intelligent design. We find that the ichthyosaur had large ear bones, indicating that they had a good sense of hearing. These ear bones were able to carry sound vibrations from both air and water to the inner ear. The eye sockets were very large, indicating that they may have hunted at dusk or in deeper water. In one specimen, the eye orbit was four inches in diameter. The eyeballs were surrounded by a ring of bones, the sclerotic ossicle, which probably protected their eyes when diving abruptly for prey. Buckland states, ". . . the preservation of this curiously constructed hoop of bony plates, shews that the enormous eye, of which they formed the front, was an optical instrument of varied and prodigious power, enabling the Ichthyosaurus to descry its prey at great or little distances, in the obscurity of night, and in the depths of the sea . . ." (William Buckland, *Geology and Mineralogy, Considered with Reference to Natural Theology*, volume 1,William Pickering, 1836, p. 174.)

It has also been suggested that this ring of bones was useful for protecting the eye from being slapped by the small waves whenever they surfaced. They may have also given the eyes of the ichthyosaurs both microscopic and telescopic powers. "In living animals these bony plates are fixed in the exterior or sclerotic coat of the eye, and vary its scope of action, by altering the convexity of the cornea: by their retraction they press forward the front of the eye and convert it into a microscope; in resuming their position, when the eye is at rest, they convert it into a telescope." (Ibid., p. 174.)

The snout was elongated which gave it a porpoise-like appearance. The long jaws were not composed of one long bone. If they had been, the lower jaw could have been fractured when the jaws had to snap shut on a squirming prey. Instead they were composed of several smaller bones. Dr. Buckland comments, "This contrivance in the lower jaw, to combine the greatest elasticity and strength with the smallest weight of materials, is similar to that adopted in binding together several parallel plates of elastic wood . . . to make a crossbow. . . . As in the . . . compound bow, so also in the compound jaw of the Ichthyosaurus, the plates are most numerous and strong, at the parts where the greatest strength is required to be exerted; and are thinner, and fewer, towards the extremities, where the service to be performed is less severe." (Ibid., p. 176.)

One of the reasons that sea dragons were seen less frequently is because they were able to stay underwater for long periods of time made possible by the design of their ribs. The ribs of the right side were united to those of the left by a set of intermediate bones which came to be referenced as the *"sterno-costal"* arcs. "This structure was probably subservient to the purpose of introducing to their bodies an unusual quantity of air; the animal by this means being enabled to remain long beneath the water, without rising to the surface for the purpose of breathing." (Ibid., p. 180.) Ichthyosaurs had both paddles (flippers) and fins. The fins probably were used for stabilization and steering and the paddles for lift, but neither were used for propulsion. This was accomplished by the tail, swishing back and forth rapidly which may have allowed it to swim at speeds up to 40 miles per hour.

Dr. Buckland commented that the design of these amazing creatures showed a ". . . union of compensative contrivances, so similar in their relations, so identical in their objects, and so perfect in the adaptation of each subordinate part, to the harmony and perfection of the whole; that we cannot but recognize throughout them all, the workings of one and the same eternal principle of Wisdom and Intelligence, presiding from first to last over the total fabric of the Creation." (Ibid., p. 186.)

As competent paleontologists began to prepare and display these fossils, the more it became obvious that these creatures must have been fearsome predators of the ancient world's warm, shallow seas. In fact, as more of these were reconstructed and displayed in museums, many began to wonder if they had been the terrible sea monsters the ancient and medieval mariners had talked about.

This latter suggestion, of course, has been ridiculed by many in the scientific community, because they insist that these fossils were found in rocks that date back millions of years. They believe that the ichthyosaurs as well as many other creatures found in the sedimentary rocks were buried slowly and gradually. For example, with regard to the ichthyosaurs, one popular book on this subject states, "This unusually fine fossil preservation is probably due to the bottom waters at Holzmaden being inhospitable to life because of the absence of oxygen. Any ichthyosaur dying and sinking to the sea floor would lie undisturbed because of the absence of scavengers (crabs, small fish, etc.) picking the body apart. Fine mud would eventually cover the carcass, recording the delicate skin as a dark silhouette." (*The Ultimate Dinosaur*, Editors: Byron, Preiss and Robert Silverberg, October, 1992, p. 234.) But animals which are in the ocean today are eaten by predatators or disintegrate in the salty ocean water whether floating to the surface or sinking to the bottom. They do not fall to the sea floor to become slowly and gradually covered with fine mud. Many ichthyosaurs are very well preserved. This would necessitate rapid (catastrophic) burial. And, indeed, a great many of them suffered this fate, "Hundreds of beautifully preserved skeletons, with the bones still joined, or articulated, as in life, have been found." (Steve Parker, *The Encyclopedia of the Age of the Dinosaurs*, 2000. p. 119.)

The fossil record indicates, not the uniformitarian, but the catastrophic nature of the burial and preservation of the sea dragons. This is evident from the discovery of at least two ichthyosaurs that were covered with sediment so rapidly that their offspring were fossilized in the process of giving birth. In addition to this, several have been found with their last meal still in the stomach area, including parts of pterosaurs!

Pterosaurs were the flying reptiles of the ancient world. Why would they wind up in an ichthyosaur's stomach? This was more than likely due to the immense amount of volcanism that was going on during the Flood year. These would have put large volumes of volcanic gases and ash into the atmosphere, which in many cases would have suffocated birds and pterosaurs. As they fell into the sea, some of them would have been quickly eaten by large fish or marine reptiles.

In some cases we not only have articulated bones of the ichthyosaur skeletons but carbonized skin impressions as well. This is even acknowledged by the authors who talk about slow and gradual covering of these reptiles with fine muds, "Carbonized skin impressions have been found around the skeletons of ichthyosaurs in the black shales at Holzmaden, Germany." (Op. cit., p. 234.)

Evolutionists today teach that these creatures became extinct 65 million years ago, a number which has grown in magnitude historically. For example, in 1905 *Nature* magazine reporting on dinosaurs says, "It is almost an appalling thought that the skeleton of a creature which lived at least several million years ago should have come down in such marvellous preservation to our own day." (———, "The New Diplodocus Skeleton," *Nature*, May 25, 1905, p. 83.) According to the time reckoning in 1905, the dinosaurs lived only "several" million years ago. Now, today's paleontologists are "sure" that they became extinct 65 million years ago and lived on the earth as many as 220 million years ago. (This time parameter, of course, applies to the dinosaurs, sea dragons, and pterosaurs.)

However, sea monsters or sea dragons have been referenced in many secular sources throughout human history. Modern paleontologists hold to the idea that the sea "dragons" are only mythological in nature, but refer at times to fossil ichthyosaurs and plesiosaurs as "sea dragons," i.e., "They were thought to belong to the euryapsid group of reptiles along with other sea dragons such as nothosaurs and plesiosaurs." (Steve Parker, *Age of the Dinosaur*, p. 116.) The late Carl Sagan titled his book that includes information on dinosaurs, *The Dragons of Eden*. Further, Christopher McGowan, Curator of Vertebrate Paleontology at the Royal Ontario Museum in Toronto and Professor of Zoology at the University of Toronto, gave his book on dinosaurs, pterosaurs, and marine reptiles the title, *Dinosaurs, Spitfires, and Sea Dragons*.

The Scriptures indicate very clearly that sea dragons were part of the original creation and are mentioned as being alive and flourishing even after the time of Noah's flood. For instance, in Psalm 74:13 we read, "Thou didst divide the sea by thy strength: thou brakest the heads of the dragons in the waters." The Hebrew word used here for dragons is *"tannim."* This is the same Hebrew word which refers to the land dragons (dinosaurs) in a variety of Scriptures including, for instance, in Malachi 1:3 which reads, "And I hated Esau, and laid his mountains and his heritage waste for the dragons of the wilderness."

Clearly, it is important for Christians to realize in this age when the doctrine of Creation has been undermined by the teaching of evolution, that God has been careful to reference all the major animal groups that He created, as well as an account of a global flood of judgment which made it possible for animals of the ancient world to be fossilized. If it was not for this great watery catastrophe that covered the entire earth, we would not find articulated fossil remains of animals on every continent. In the Scriptures, the Lord God has documented the fact that many of these creatures lived for an extended period of time after the Flood. During this time, they were also referenced by navigators who encountered them during their sea travels. The Biblical and secular accounts of the land dragons (dinosaurs) and sea dragons (ichthyosaurs) enable us who live in a time of great apostasy and unbelief to have strong confidence in the reliability of the Scriptures.

**\*Mace Baker is the author of the book, *The Real History of Dinosaurs* (2001).**

Dr. John's Q&A

**Does Salt Come from Evaporated Sea Water?** (#167)

by John Morris, Ph.D.

***Abstract*** *Many have observed that the large salt accumulations occur in basins formed by major tectonic downwarping, often associated with ancient volcanic eruptions.*

Seawater contains a variety of salts, and when seawater evaporates, these solids are left behind. The most abundant salt in seawater is sodium chloride (NaC1) which will be referred to in this article simply as salt (technically it is called halite).

Layers of salt occur naturally in the geologic record, comprising an abundant source of salt for human consumption worldwide. Today, some salt deposits are land derived, as when salty water seeps from the rocks of Grand Canyon, evaporates and leaves a salty residue. Others are related to enclosed coastal lagoons, which fill up with seawater during a storm, but whose waters are trapped and evaporate between storms. Thus, salt deposits are classed as evaporites.

If a basin of seawater 100 feet thick were to evaporate, only about 2 feet of salt would be left behind. Can seawater evaporation account for all "evaporites"? If so, multiplied millions of years would be necessary for their build up, for some salt beds are extremely thick and wide. The salt deposits often occur in layers covering thousands of square miles with salt hundreds of feet thick.

Old earth uniformitarian thinking postulates an enclosed basin or coastal lagoon which repeatedly floods and evaporates over long periods of time, allowing thick deposits of salt to build up. The mind boggles at huge basins undergoing identical cycles of flooding and evaporation uncountable times, all the while remaining in the same location for millions and millions of years. By contrast, modern lagoons fill in, migrate, erode—there is no long-term stability for coastal features.

The regionally extensive salt beds in the geologic record are quite different from evaporites forming today. Seawater contains many chemical and mineral impurities as well as both single-celled and multi-celled plants and animals and any exposed dry lagoon will be an active life zone. Thus, modern evaporites are quite impure. But the major salt deposits in the geologic record are absolutely pure salt! Salt mines simply crush it and put it on the store shelf. Surely these large, pure salt beds are *not* evaporated seawater. Some other process must have formed them.

As with many features in geology, catastrophic views are replacing the old, impotent uniformitarian ones. Many have observed that the large salt accumulations occur in basins formed by major tectonic downwarping, often associated with ancient volcanic eruptions. The evidence does not fit with the idea of a trapped lagoon. Where are the fossils? Where are the impurities?

Many now think the salt was extruded in superheated, supersaturated salt brines from deep in the earth along faults. Once encountering the cold ocean waters, the hot brines could no longer sustain the high concentrations of salt, which rapidly precipitated out of solution, free of impurities and marine organisms.

The great Flood of Noah's day provides the proper context. During the Flood, great volumes of magma, water, metals, and chemicals, were extruded onto the surface from the depths of the earth, as the "fountains of the great deep" (Genesis 7:11) spewed forth hot volcanic materials. Today we find them (especially salt) interbedded with Flood sediments, just as the "Back to Genesis"model predicts.

Dr. John's Q&A

**How Long does it Take for a Canyon to Form?** (#156)

by John Morris, Ph.D.

***Abstract*** *Rapidly moving water could both dislodge the particles and carry them down stream, leaving underlying sediments vulnerable to erosion. In total, these six days of runaway ditch erosion removed nearly five million cubic feet of silt, sand, and rock.*

ICR has long had a deep interest in magnificent Grand Canyon. This awesome wonder of the natural world, we believe, bears eloquent testimony to the great flood of Noah's day.

Visitors to Grand Canyon as well as eighth grade earth science students have been traditionally taught that the Colorado River, migrating back and forth for 65 million years, coupled with side canyon erosion, has carved out this immense gorge. In recent years, scientists have disproved that idea, leaning now on a great volume of water rushing through the area at a high velocity not very long ago which carved the canyon. (Unfortunately, school students are still being taught the older, long-age model.)

Let me introduce you to Burlingame Canyon near Walla Walla, Washington. It measures 1500 feet long, up to 120 feet deep, and 120 feet wide, winding through a hillside. A small-scale analogy to Grand Canyon it was observed to form in less than six days.

In 1904 the Gardena Farming District constructed a series of irrigation canals to provide water to this normally rather arid high desert area. In March, 1926, winds collected tumbleweeds at a concrete constriction along one of the canals situated on an elevated mesa, choking the flow of water, which at 80 cubic feet per second was unusually high due to spring rains. In order to clean out the obstruction, engineers diverted the flow into a diversion ditch leading to nearby Pine Creek. Prior to this time the ditch was rather small, at no location greater than 10-feet-deep and six-feet-wide, and often with no water in it at all.  
  
The abnormally high flow crowded into the ditch, and careened along until it cascaded down the mesa in an impressive waterfall. Suddenly, under this extreme pressure and velocity, the underlying stratum gave way and headward erosion began in earnest. What once was an insignificant ditch became a gully. The gully became a gulch. The gulch became a miniature Grand Canyon.

The eroded strata consisted of rather soft sand and clay saturated by the recent rains. The dewatering of the saturated sediments into the now-open ditch enhanced the erosion. The rapidly moving water could both dislodge the particles and carry them down stream, leaving underlying sediments vulnerable to erosion. In total, these six days of runaway ditch erosion removed nearly five million cubic feet of silt, sand, and rock.

Yes, canyons can form rapidly. A good maxim to remember is that, "It either takes a little water and a long time, or a lot of water and a short time." But then, we've never seen a canyon form slowly with just a little water. Whenever scientific observations are made, it's a lot of water and a short time.

Dr. John's Q&A

**Why Does Nearly Every Culture Have a Tradition of a Global Flood?** (#153)

by John Morris, Ph.D.

***Abstract*** *One of the strongest evidences for the global flood which annihilated all people on Earth except for Noah and his family, has been the ubiquitous presence of flood legends in the folklore of people groups from around the world.*

*"Where is the wise? where is the scribe? where is the disputer of this world? hath not God made foolish the wisdom of this world?"* (I Corinthians 1:20)

One of the strongest evidences for the global flood which annihilated all people on Earth except for Noah and his family, has been the ubiquitous presence of flood legends in the folklore of people groups from around the world. And the stories are all so similar. Local geography and cultural aspects may be present but they all seem to be telling the same story.

Over the years I have collected more than 200 of these stories, originally reported by various missionaries, anthropologists, and ethnologists.

While the differences are not always trivial, the common essence of the stories is instructive as compiled below:

1. Is there a favored family? 88%
2. Were they forewarned? 66%
3. Is flood due to wickedness of man? 66%
4. Is catastrophe only a flood? 95%
5. Was flood global? 95%
6. Is survival due to a boat? 70%
7. Were animals also saved? 67%
8. Did animals play any part? 73%
9. Did survivors land on a mountain? 57%
10. Was the geography local? 82%
11. Were birds sent out? 35%
12. Was the rainbow mentioned? 7%
13. Did survivors offer a sacrifice? 13%
14. Were specifically eight persons saved? 9%

Putting them all back together, the story would read something like this:

Once there was a worldwide flood, sent by God to judge the wickedness of man. But there was one righteous family which was forewarned of the coming flood. They built a boat on which they survived the flood along with the animals. As the flood ended, their boat landed on a high mountain from which they descended and repopulated the whole earth.

Of course the story sounds much like the Biblical story of the great flood of Noah's day. The most similar accounts are typically from middle eastern cultures, but surprisingly similar legends are found in South America and the Pacific Islands and elsewhere. None of these stories contains the beauty, clarity, and believable detail given in the Bible, but each is meaningful to their own culture.

Anthropologists will tell you that a myth is often the faded memory of a real event. Details may have been added, lost, or obscured in the telling and retelling, but the kernel of truth remains. When two separate cultures have the same "myth" in their body of folklore, their ancestors must have either experienced the same event, or they both descended from a common ancestral source which itself experienced the event.

The only credible way to understand the widespread, similar flood legends is to recognize that all people living today, even though separated geographically, linguistically, and culturally, have descended from the few real people who survived a real global flood, on a real boat which eventually landed on a real mountain. Their descendants now fill the globe, never to forget the real event.

But, of course, this is not the view of most modern scholars. They prefer to believe that something in our commonly evolved psyche forces each culture to invent the same imaginary flood legend with no basis in real history. Instead of scholarship, this is "willful ignorance" of the fact that "the world that then was, being overflowed with water, perished" (II Peter 3:5,6).

Dr. John's Q&A

**How Could Noah Have Built the Ark All by Himself?** (#136)

by John Morris, Ph.D.

***Abstract*** *Let's assume that only Noah and his three sons were available to help. Could they have done it all by themselves? To answer this we must first understand the magnitude of the job.*

*". . . the works were finished from the foundation of the world."* (Hebrews 4:3)

Some have ridiculed the Flood story by insisting that the job of the Ark's construction was impossibly large. How could Noah have done it? Admittedly, we don't have all the details, but let's make some reasonable assumptions and see if the task is too great.

The Lord predicted that His judgment on the sinful civilization in the days of Noah would come in 120 years (Genesis 6:3). When He told Noah and instructed him to build the Ark (6:14-16) is unclear. But let's assume that Noah had the full 120 years warning.

Noah's three sons began to be born 100 years before the Flood (cf. 5:32 with 7:6) and within a few years were able to help. There may have been others to help as well, for grandfather Methusalah was alive during the entire construction period, dying the year of the Flood. There may have been others in a godly remnant of whom we know nothing. All we know now is that only eight people, Noah and his wife, their three sons, and their wives, constituted the faithful still living when the Flood finally came (7:13; II Peter 2:5). It may also have been that Noah hired construction workers to help. He must have been at least wealthy enough to abandon his livelihood during this period, but again we have no knowledge of these details.

Let's take the worst case scenario. Let's assume that only Noah and his three sons were available to help. Could they have done it all by themselves? To answer this we must first understand the magnitude of the job.

In Scripture we are only told the gross dimensions of the Ark—450 feet long, 75 feet wide, and 45 feet high, assuming a cubit of 18" (6:15). We also know that the Ark had three decks (6:16). Thus the overall volume of the Ark was:

**450 x 75 x 45 = 1.52 x 106 ft.3**

But a structure consists mostly of open space. Most houses are over 95% open, less for large ships. In our worst case scenario, let's assume that 20% of the Ark's volume was worked lumber that the four men had to gather, transport to the construction site, do the necessary shaping and install.

**1.52 x 106 x .2 = .304 x 106 ft.3**

Remember, the Ark didn't have to win any beauty contests, or speed races, it just had to be strong and float. It probably more resembled a rough barn or stable in workmanship. The generations so soon after creation, living in an ideal environment with long life spans, were no doubt intelligent and capable. It hardly matters if the family were experienced in construction for within a year or so they would have been true professionals. An experienced crew of four could have installed, we assume, an average of 15 cubic feet of wood per day. If anything, this estimate seems low, but this is the worst case!

**15 ft x 6 days x 52 wks = 4,680 ft3/year**

It's now easy to calculate how long it would have taken.

|  |  |
| --- | --- |
| **0.304 x 106 ft3** | **= 65 years** |
|  |
| **4,680 ft3/year** |

Sixty-five years under this worst case scenario! A big job, yes, but Noah was a faithful man, and accomplished the task. As we see, even simple calculations can enhance our faith in God's Word.



**Biblical Uniformitarianism** (#128)

by Henry Morris, Ph.D.

***Abstract*** *"While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease" (Genesis 8:22).*

Christians who believe the Biblical record of recent creation and the worldwide Flood have long recognized the key significance of the Apostle Peter's commentary on these two defining events in world history.

*There shall come in the last days scoffers, walking after their own lusts, And saying, where is the promise of His coming? for since the fathers fell asleep, all things continue as they were from the beginning of the creation. For this they willingly are ignorant of, that by the word of God the heavens were of old, and the earth standing out of the water and in the water: Whereby the world that then was, being overflowed with water, perished* (II Peter 3:3-6).

Peter was writing to all "*them that have obtained like precious faith with us through the righteousness of God and our Savior Jesus Christ*" (II Peter 1:1). This declaration surely includes all true Christians and (under divine inspiration) is written in the context of future trends "*in the last days*" (II Peter 3:3).

Consequently his warnings and exhortations are more relevant to us today than to anyone before us, for we are closer to the last days (and quite possibly *in* them) than any one before us. A true Biblical worldview for these days, therefore, must correlate with Peter's divinely inspired prophecy.

Although I was probably not the first to do so, I remember teaching on this passage to a Bible class more than 55 years ago, while on the faculty of Rice University, and I discussed it in my first book, *That You Might Believe*, published in 1946. I stressed its significance at the 1953 convention of the American Scientific Affiliation in a paper entitled, "Biblical Evidence for Recent Creation and a Worldwide Deluge," and this paper was reprinted in the January 1954 issue of *His* (the magazine of the Inter-Varsity Christian Fellowship). It was emphasized also in the book, *The Genesis Flood*, written by Dr. John Whitcomb and myself and published in 1961 (see especially the conclusion of the book, pages 451-453). In its context (the last chapter written by Peter before his martyrdom), it is surely a critically important component of God's Word to professing Christians today.

The reason why it is so relevant today is because of both its prophecy of the dominant secular uniformitarianism of the last days and also because of its cogent answer to this philosophy.

"*All things continue as they were from the beginning of the creation*." This is as succinct a definition of the dogma of uniformitarianism as one could find. Not only the basic "laws of nature," but also all natural processes are assumed to be always essentially equivalent to those operating today—similar rates of erosion and deposition, similar rates of salt influx to the sea, similar rates of radioactive decay, similar rates of biological variation, similar rates even of local flooding and volcanism, etc. No sudden global change in earth processes, and certainly no divine intervention in these processes is allowed. This has been the accepted scientific worldview for the past two centuries.

But this assumption is very wrong. There have been two tremendous global divine interventions in the uniform course of natural processes in the past—Creation and the Flood! "*By the word of God, the heavens were of old, and the earth. . . .*" The cosmos was created, not by continuing natural processes, but by one supernatural "process"—the spoken word of God!

Secondly, "*the world that then was, being overflowed with water, perished*." This cataclysmic destruction of the prediluvian cosmos necessarily implies a sudden drastic change in all process rates—the *world itself* perished during the great flood!

The changed world that later emerged as the waters retreated following the year of the Flood, when the present continents were uplifted, the present ocean basins established, and all the residual catastrophism following the Flood (Ice Age, etc.) settled down, soon became a world where uniform processes would prevail thereafter. God Himself promised: "*I will not again curse the ground any more for man's sake . . . neither will I again smite any more every thing living, as I have done.* While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease" (Genesis 8:21,22).

That is, as long as the present earth remains (though not forever, for the earth will eventually be purged by fire—II Peter 3:10), there would be no other global cataclysm, and the basic geophysical processes—the rotation of the earth and its orbital revolution and inclination of its axis around the sun—which basically control or influence all other natural processes, would be constant. Thus uniformitarianism would be a valid principle with which to study all natural phenomena since the end of the Flood period.

But not before! The Flood caused such a drastic change in most natural processes—especially those of erosion and deposition, but of most others as well—that scientists cannot *legitimately* extrapolate present processes beyond that period in the past.

This is true *Biblical uniformitarianism*. Even then, however, the *basic laws of nature* did not change. These were established at the end of the period of Creation, including the Fall and Curse. The two most basic and certain natural laws are those of conservation and decay, the First Law of Thermodynamics (conservation of mass/energy) and the Second Law of Thermodynamics (increasing entropy or decreasing organizational complexity). All natural processes operate within the constraints imposed by these two universal divinely imposed laws of nature and nature's God.

The First Law was established following the completion of God's work of creation, when the Creator (the Lord Jesus Christ) "*rested from all His work which God created and made*" (Genesis 2:3). He is ever since "*upholding all things by the word of His power*" (Hebrews 1:3). No matter or energy can be naturally either created or destroyed, because God is *conserving* what He created. (Special local miracles are an exception to this principle, but there must be strong reason and evidence for any such alleged miracle.)

Then the Second Law was enacted by God following Adam's sin, introducing the great Curse of pain, decay, and death not only on Adam but also on all his dominion. "*Cursed is the ground for thy sake . . . and unto dust shalt thou return*" (Genesis 3:17,19). Ever since that time, "*the whole creation groaneth and travaileth in pain together until now*" (Romans 8:22).

Thus the basic laws of science go back just to the end of the Creation/Fall period, while the natural processes operating within the constraints of the two laws have been operating uniformly only since the end of the Flood period. Recognition of this Biblical fact means that one cannot estimate the age of the earth with any process based on the premise of uniformitarianism, since that premise is valid at best only back to the end of the Flood period.

This conclusion is of fundamental importance in dealing with the question of origins. Evolutionism depends for its supposed evidence entirely on the assumed billions of years of geologic history. However, all such estimates of age must necessarily be based on the assumption of uniformitarianism as applicable back to the very beginning. This fact applies to age calculations based on any geological, biological, or cosmological process whatever. This constraint must also affect radioactive decay processes, which are those few processes that have been used to support the argument that the earth is billions of years old. The so-called "daughter/parent" isotope ratios in certain minerals found in igneous rocks, therefore, are *not* a legitimate indicator of the age of those rocks or of the mantle from which they may have emerged. They cannot really be the product of the decay of the daughter isotope from the parent at present decay rates, if the Biblical record is inerrant, as most Christians believe. Rather, these ratios must be viewed either as created directly during the Creation period or by vastly accelerated decay rates during either that period or the Flood period, or perhaps by profound contamination during the Flood.

To say that such a conclusion is "unscientific" is to say much more than one knows and is essentially an admission of intolerant atheism. If God exists, and if the overwhelming evidences that the Bible is God's Word are valid evidences, then God could indeed miraculously have created the whole world in a state of functioning maturity (a better term than "apparent age"), and He could also miraculously increase process rates (including radioactive decay rates) in connection with His global intervention in natural processes at the times of the Curse and/or the Flood. Both these periods were times of special divine activity in respect to the earth and its processes, as clearly revealed in the Bible.

Biblical uniformitarianism is a valid premise back to the end of the Flood period, but secular uniformitarianism back to "*the beginning of the creation*" is not. If we really want to ***know*** the time when the world began, we must ask the One who created it, for only He was there. He has provided this information in His inspired Word, the Holy Scriptures, but the tragedy is that the modern world—including, sadly, many leaders in the evangelical world—are afraid to believe what He has said.

\* Dr. Morris is Founder and President Emeritus of ICR.



**Why Christians Should Believe in a Global Flood** (#116)

by Henry Morris, Ph.D.

***Abstract*** *"The LORD sitteth upon the flood; yea, the LORD sitteth King for ever" (Psalm 29:10).*

The Biblical Flood in the days of Noah has become a great divide between two watersheds of belief. On the one hand there are those who say it is either a purely mythological event or else possibly a local or regional flood. This group includes practically all evolutionists, but it also includes the "old-earth creationists."

These all accept the so-called geological ages as the approved record of Earth history, recognizing that a global hydraulic cataclysm would have destroyed any evidence for such geological ages. The geological ages concept and a worldwide devastating Flood logically cannot coexist.

On the other hand, "young-earth creationists" accept the Biblical record of the Flood as a literal record of a tremendous cataclysm involving not only a worldwide Flood, but also great tectonic upheavals and volcanic outpourings that completely changed the crust of the earth and its topography in the days of Noah.

Those of us who hold this view are commonly ridiculed as unscientific and worse, so it would be more comfortable and financially rewarding if we would just go along with the evolutionary establishment, downgrade the Flood, and accept the geological ages.

But this we cannot do for a number of, what seem to us, compelling reasons. In fact, I have made a list of 100 reasons for believing in a global Flood. For those who are interested, the list is included in two of my books, *The Genesis Record* and *The Defender's Study Bible*.

### **Biblical Reasons**

A few of the many Biblical reasons for believing in the global Flood are briefly summarized below. For those who believe in the Bible as the inerrant word of God, these should be sufficient.

1. Jesus Christ believed the Old Testament record of the worldwide Flood. Speaking of the antediluvian population, He said: "The flood came, and took them all away" (Matthew 24:39). Evolutionary anthropologists are all convinced that people had spread over the entire Earth by the time assigned to Noah in Biblical chronology, so an anthropologically universal Flood would clearly have required a geographically worldwide Flood.
2. The apostle Peter believed in a worldwide hydraulic cataclysm. "Whereby the world [Greek, *kosmos*] that then was, being overflowed [Greek, *katakluzo*] with water, perished" (II Peter 3:6). The "world" was defined in the previous verse as "the heavens . . . and the earth." Peter also said that "God . . . spared not the old world, but saved Noah . . . bringing in the flood [Greek, *kataklusmos*] upon the world of the ungodly" (II Peter 2:5). Note also that these words *katakluzo* and *kataklusmos* (from which we derive our English word "cataclysm") are applied exclusively in the New Testament to the great Flood of Noah's day.
3. The Old Testament record of the Flood, which both Christ and Peter accepted as real history, clearly teaches a global Flood. Therefore, it seems to us that *Christians*, professing to believe in Christ and follow Him, can do no less. For example, the record emphasizes that "all the high hills, that were under the whole heaven . . . and the mountains were covered" (Genesis 7:19,20) with the waters of the Flood. This must have included Mount Ararat on which Noah's Ark landed, and which is now 17,000 feet high. This was no *local* flood!
4. Since "all flesh died that moved upon the earth . . . all that was in the dry land" (Genesis 7:21,22), Noah and his sons had to build a huge Ark to preserve animal life for the post-diluvian world—an Ark that can easily be shown to have had more than ample capacity to carry at least two of every *known species* of land animal (marine animals were not involved, of course). Such an ark was absurdly unnecessary for anything but a global Flood.
5. God promised that never "shall there any more be a flood to destroy the earth" (Genesis 9:11), and He has kept His word for over four thousand years, if the Flood indeed was global. Those Christians who say it was a local flood, however, are in effect accusing God of lying, for there are many devastating local floods every year.

### **Scientific Reasons**

The earth's surface and sedimentary crust also bear strong witness to the historicity of a worldwide Flood, and the early geologists (Steno, Woodward, etc.) taught this. Most modern geologists have argued, on the other hand, that the earth's crust was formed slowly over billions of years. Yes, but consider the following significant facts.

1. All the mountains of the world have been under water at some time or times in the past, as indicated by sedimentary rocks and marine fossils near their summits. Even most volcanic mountains with their pillow lavas seem largely to have been formed when under water.
2. Most of the earth's crust consists of sedimentary rocks (sandstones, shales, limestones, etc.). These were originally formed in almost all cases under water, usually by deposition after transportation by water from various sources.
3. The assigned "ages" of the sedimentary beds (which comprise the bulk of the "geologic column") have been deduced from their assemblages of fossils. Fossils, however, normally require very rapid burial and compaction to be preserved at all. Thus every sedimentary formation appears to have been formed rapidly—even catastrophically—and more and more present-day geologists are returning to this point of view.
4. Since there is known to be a global continuity of sedimentary formations in the geologic column (that is, there is no *worldwide* "unconformity," or time gap, between successive "ages"), and since each unit was formed rapidly, the entire geologic column seems to be the product of continuous rapid deposition of sediments, comprising in effect the geological record of a time when "the world that then was, being overflowed with water, perished."
5. It is also significant that the types of rocks, the vast extent of specific sedimentary rock formations, the minerals and metals, coal and oil found in rocks, the various types of structures (i.e., faults, folds, thrusts, etc.), sedimentary rocks grossly deformed while still soft from recent deposition, and numerous other features seem to occur indiscriminately throughout the various "ages" supposedly represented in the column. To all outward appearances, therefore, they were all formed in essentially the same brief time period.
6. The fossil sequences in the sedimentary rocks do not constitute a legitimate exception to this rule, for there is a flagrant circular reasoning process involved in using them to identify their supposed geologic age. That is, the fossils have been dated by the rocks where they are found, which in turn had been dated by their imbedded fossils with the sequences based on their relative assumed stages of evolution, which had ultimately been based on the ancient philosophy of the "great chain of being." Instead of representing the evolution of life over many ages, the fossils really speak of the destruction of life (remember that fossils are dead things, catastrophically buried for preservation) in one age, with their actual local "sequences" having been determined by the ecological communities in which they were living at the time of burial.
7. The fact that there are traditions of the great Flood found in hundreds of tribes in all parts of the world (all similar in one way or another to that in the Genesis record) is firm evidence that those tribes all originated from the one family preserved through the cataclysm.

This brief article is a mere introduction to the large array of scientific and Biblical evidences that could be cited for the great Flood of the Bible, global in extent and cataclysmic in character and results. The book, *The Genesis Flood* (coauthored by Dr. John Whitcomb and myself back in 1961), supplemented by many subsequent books and especially by many writers and articles in the *Creation Research Society Quarterly* scattered over its 35 years of publication, as well as various other creationist journals, provides an abundance of further evidence and documentation of the global extent and cataclysmic nature of the Flood.

One can understand why atheistic and pantheistic evolutionists have to interpret Earth history in terms of great ages and evolution, rather than Creation and the Flood. They really have no other choice, once they have decided to reject the God of Creation and His record in the Bible. However, it is very difficult to understand why men and women who do believe in God and His word do this. The Bible is explicitly clear on the global Deluge, and sound scientific evidence supports it.

But this position does mean that the geological ages could never have happened, and too many establishment-oriented Christians are not yet willing to take such a stand. And that's rather sad in these last critical days.

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