

Can Sedimentary Rocks Tell Time?

By Ian Taylor

The invention of the steam engine in the 1700's, and the Industrial Revolution which followed heightened interest in the study of rock formations to a degree that was previously unknown.

Coal was the fuel of steam engines and had to be supplied in great quantities to the burgeoning manufacturing industry. England was well endowed with coal, but systematic ways of finding coal beds had to be developed in order to feed the growing demand. The association of coal with certain rock formations was central to this effort. By the 1830's the coal mined in England accounted for well over half of the world's output. In addition, the challenge of economically moving large quantities around the countryside meant that a new system of transportation was needed. Before the steam locomotive arrived on the scene, barges operating on canals offered the best means of transportation, and England experienced a burst of canal building. Because digging was done by hand it was important to learn more about such things as rock cleavage and minerals. It was also necessary to gather information about which types of rock strata could be relied upon to hold water and resist leakage. Thus, canal building provided an impetus for geological studies.

Well into the 1800's layers of rock continued to be studied and named according to their mineral content. Stone consisting of calcium carbonate or lime, was called "limestone," stone which had formed from grains of sand, was known as "sandstone." Similarly, chalk beds were made of chalk and coal beds comprised of coal. The study of rock formations soon revealed that there were patterns in the layering of rock strata. For example, in England it was found that coal beds, or "coal measures" as they were known, always appeared below red sandstone and often above carboniferous limestone. Where strata were tilted and either red sandstone or carboniferous limestone were found at the surface, outcrops of the much sought-after coal would likely be near at hand.

William Smith (1769-1839) was employed as a canal builder by the Somerset Coal Company and is often regarded today as the father of stratigraphy. Smith, and other canal builders of his time, noticed that most rock strata lay in the same vertical order from one end of the country to the other. These men had developed a trade secret for identifying various strata by the fossils found within them. In the 1790's Smith's rule-of-thumb for identifying rock strata was being formalized in Paris by Baron Cuvier and his friend Alexander Brongniart; their work was eventually published in English in 1810. In the meantime, Smith had managed to produce a remarkably accurate geological map of England and, in his old age, Smith was awarded the Wollaston Medal by the Geological Society of London ostensibly in recognition of his contribution to geology. However, it would seem that the true motive of the Society was to trumpet the English claim that fossil-based stratigraphy originated not with Cuvier in France but with Smith in England.

Looking at the rock strata in cliffs and gorges, Cuvier reasoned correctly that the material making up the rock had been deposited as sediment in water. He also believed that the fossils

within the rocks were the remains of creatures which were living at the time sedimentation took place. However, when he saw uniform layers of sandstone laying on top of limestone which in turn lay upon layers of shale, he found it difficult to believe how so many different types of sediment could have been deposited in a single flood as described in the book of Genesis. He concluded that there must have been a number of successive floods each depositing a layer of sediment that would trap within it the plants and animals living at that particular time. Cuvier thought that after the flood waters receded the sediment would dry out, harden into rock and even partially erode before a subsequent flood occurred. He identified at least twenty-eight different kinds of sedimentary rock, (e.g. limestone, slate, sandstone etc.) and proposed that as many floods were needed to account for them. This was known as the "Multiple Flood Theory". Each flood was thought to be local and brought about by the subsiding and subsequent uplifting of large areas of land as big as entire continents. According to this approach, the Genesis Flood was simply the last of a series of floods and occurred five or six thousand years ago.

At the time Cuvier was promoting his theory and young William Smith was digging his canals, James Hutton in Scotland was writing about earth history in terms of millions of years. Hutton was a triple PhD, having studied at three universities. He claimed that given enough time, the natural processes we see going on today could readily explain all the geological features that were being ascribed to the Genesis Flood. Hutton's explanation was not popular in his day, possibly because it did too much violence to the Biblical account, but the idea was picked up a generation later by Charles Lyell. Lyell, a lawyer, made no effort to disguise his dislike for geologic interpretations based on Moses. The arguments of Lyell and Hutton have now been largely destroyed, but were very persuasive. The notion of slow-acting nature soon became dogma and only in recent years has this view been seriously challenged by scientists who acknowledge the evidence for catastrophic events in the earth's history.

Somewhat surprisingly, Christian theologians were complicitous in the frontal attack launched by Hutton and Lyell on the Genesis account of a universal flood. As early as 1814, a Scottish professor of theology, Thomas Chalmers, developed the "Gap Theory" as a compromise between Genesis and Cuvier's multiple flood geology. Chalmers supposed that there was a pre-Adamic world which God had destroyed by a flood. To explain the familiar multi-layered rock strata he further supposed that there were many floods before the earth was finally replicated. In this way, most if not all, the fossils are the remains of this pre-Adamic world enabling the geologist to have as many years as he wishes without violating Scripture. The Gap Theory requires that the flood of Noah be a very mild or local affair in order that it did not disturb the existing fossil evidence. In fact, the idea of a "tranquil" Noachic Flood was put forward in 1826 by Scottish minister, John Fleming. His reasoning was based upon the mention of the olive leaf brought back to the Ark by the dove. Fleming erroneously supposed that the Flood waters rose slowly to cover the earth and then, just as slowly, went back again without disturbing so much as the leaves on the trees! A very influential Anglican

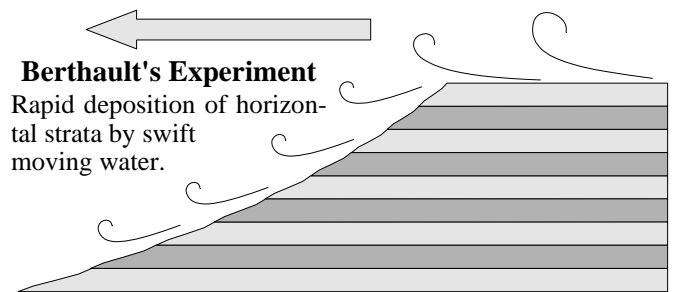
Churchman, Canon William Buckland, popularized these ideas in his 1836 contribution to the famous Bridgewater Treatise. Finally, Reverend Dr. John Pye Smith picked up on what some European intellectuals had been saying and in 1839 claimed that the Genesis Flood was actually a local flood which probably occurred between the Tigris and Euphrates rivers. The ideas of these men gradually undermined belief in a worldwide flood and lent credence to Lyell's history of millions of years which, in turn, prepared the way for Darwin and his theory of evolution. Darwin conceded his dependence on Lyell in no uncertain terms.

While England's theologians indulged in theorizing, the gentleman geologists of the Geological Society of London were also speculating in spite of professing not to do so. Between the years 1830 to 1840, there took place what has since become known as the Great Devonian Controversy which involved Roderick Murchison, the Reverend Adam Sedgwick and, to a lesser extent, Charles Lyell. Paleontology historian, Martin J.S. Rudwick has recently documented this era in geological thinking in fine detail and relates how Society President Roderick Murchison, along with his friends, Sedgwick and Lyell, sought to force a fundamental change in thinking among geologists. Prior to 1830, rock strata were referred to by names corresponding to their mineral content. A decade later, newly minted names such as Cambrian, Devonian, Silurian and Ordovician were commonly being used.

These new names were based upon the fossil remains of the flora and fauna believed to have been living during successive eras of earth's history. Differentiation among rock layers was now dependent upon the fossils found in them and had nothing to do with their mineral content. Murchison and his collaborators had adopted both Hutton's uniformitarian (no significant catastrophe) position and Smith's fossil-based strata identification system. Their belief was that younger strata were always deposited on top of older strata (While this seems intuitively obvious, it has now been demonstrated to be false). The important change was the subtle introduction of time into the identification of rock. This is the principle of superposition and the key to "modern stratigraphy." For example, the distinctive formation of red sandstone in Germany was at first correlated with a similar red sandstone formation in England because both formations were found on top of the coal. But then it was found that in England red sandstone also lay below the coal stratum while in Germany there was no red sandstone beneath what was assumed to be the same coal seam. This finding was inconsistent with the principle of superposition and the problem was solved by proposing that in England there were two superficially similar formations of red sandstone. The upper one became known as "New Red Sandstone" and was believed to be the same formation as that in Germany. The lower sandstone formation in England was then named the "Old Red Sandstone". By using the words "New" and "Old" rather than "Upper" and "Lower" the speculative notion of time was subtly introduced. This served no other purpose than to justify a preconceived idea of how sedimentary rocks are formed. Eventually, all the rock strata were directly identified with ages in earth's history. Murchison was able to impose this new method of naming rocks not simply because he was for a time the president of the Geological Society nor even because he was for a time the president of the British Association for the Advancement of Science. He was able to triumph because George Cuvier had promoted the notion that sediments were laid down successively and vertically, from bottom to top, by many floods. And compromising theologians prepared the church and the public to accept his ideas.

Johannes Walther (1860-1937) was the son of an evangelical clergyman in Germany. He became a widely-travelled professor of geology and paleontology; he had studied under Ernst Haeckel and was thus a thoroughgoing Darwinist. One of his early discoveries was that sediments in the sea bed are not always laid down vertically but can, in fact, be deposited horizontally. He reported this in 1893 but his discovery has been ignored for a century.

Finally, in the 1980's Guy Berthault, a sedimentologist working in France formally reported laboratory experiments in which he showed that fast moving water will carry a great deal of sediment, and when the sedimentary particles drop out they do so in a very specific order to form the familiar horizontal banding normally attributed to the slow vertical accumulation of sediments. The layers look like they may have been deposited sequentially from bottom to top, but, in fact they are all deposited simultaneously, with the top layer actually being older than the bottom in the direction of water flow. The results of Berthault's laboratory work would seem to have been confirmed in the field when in 1981 many units of thick, stratified rock were deposited, sometimes in minutes, following the eruption of Mt. St. Helens.



Can sedimentary rocks tell time? Perhaps there is some way that they can, but estimates of their age simply by which is on top and what fossils they contain can lead to ridiculous errors. Berthault's findings are an important contribution to the understanding of sedimentation mechanisms. We will examine his research on horizontal/simultaneous deposition of strata (rather than vertical over time) in another article in this series. The global flood reported in detail in Genesis and in various qualities by legends from many other cultures offers an alternate explanation. For now its importance can be summarized as follows:

If the flood included rapid transgression and regression of the ocean to and from the continents, it is indeed possible that the strata of most if not (nearly) all sedimentary rock were formed very rapidly by a horizontal deposition process rather than the commonly accepted vertical process. It is neither necessary, nor even reasonable, to invoke millions of years to account for their formation.

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Ian Taylor is the author of "In the Minds of Men," a truly important historical work (available from CSA). This article is reprinted, with permission from the Creation Science Association of Ontario. It has been slightly revised from the original.

Book of the Month:

God Made

by Isaac V. Manly, M.D.

1994, College Press Publishing Company, Joplin, Missouri

a book report by Glenn H. Kailer.

Regular Price: \$10.00 (plus postage)

Sept/Oct, 1994 price: \$9.00 (including postage)

Dr. Manly is one of the few authors I have read who describes evolution in the same way that CSA has for years, as "pseudo-scientific myth." I enjoyed reading the book, both because of specific things I learned from a Christian doctor and surgeon, but also because of some very colorful, and sometimes amusing, ways Dr. Manly made his point. Take for example, the interesting parallel he makes between the challenge of evolution and the challenge of Baal:

If you were to count the scientists who align themselves primarily with evolution, and the scientists who line up with the general account of biblical creation, you would find odds approaching that of the Mount Carmel massacre. As it turned out, though, it wasn't outnumbered Elijah whose blood was spilled.

Maybe you can relate to Dr. Manly's testimony of his struggle and conclusion:

I was a theistic evolutionist as a result of being taught evolution as a scientific fact in biology courses in premedical and medical school. My intensive study of evolution in order to relate it to the Genesis account has convinced me evolution as propounded by any theory is without foundation. Unfortunately, many church leaders have readily accepted some version of theistic evolution. Many have unwittingly urged that believers should accept the "scientific" explanation of evolution and withdraw from a confrontation. They have urged that we not "stand" on Genesis or that Genesis does not really mean what it says.

I believe the causes of this dichotomy rest primarily on two difficulties... It is hard for an ordinary person who does not carefully study all of the evidence to question the authority of his learned teachers. There is even a certain amount of "logic" to the evidence cited unless one looks at the evidence critically and with basic understanding of biological processes.

The second difficulty is unfortunate. Many of us have shallow faith in the authenticity of Scripture. We are quick to back off from holding fast to the eternal truths which God intends to reveal to us.

I enjoyed his easy to understand explanations and his wit:

The materialist suffers from the same delusion as those who believe in the extraterrestrial origin of life. If the process can be moved far enough back in time and far enough away from reality, anything might be possible. I am unable to accept such fantasy.

Evolutionists claim their theory is scientific. Where is the science? I can assure the reader the American Kennel Club would not certify an ancestor of your dog based on evidence such as paleontologists present.

All in all, a very fine book.

Audio/Video Tape of the Month:

Dinosaurs

When Did They Live - How Did They Die?

by: Bob Farwell

Movies like Jurassic Park, museums, textbooks, TV shows and virtually all government-owned and operated parks promote the apologetic myth of evolution constantly, with dinosaurs being their current favorite way of attempting to indoctrinate young people. This presentation is one of the best... informative, entertaining, and scholarly enough to be accurate, but at a level that can be understood and enjoyed by all ages.

Special: Sept/Oct 1994 Price: Audio Tape #110: \$4.00, VHS Video #V0110: * \$12.00 (includes postage)

*Note: Since January, 1994 Mark Christenson has filmed CSA sessions with his new HI-8 camera, using external sound, dramatically improving the sound and the video quality.

Are You Utilizing CSA Resources?

CSA Seminars: Community-wide, Church, School, Sunday School, Home Study Group, etc. CSA conducts seminars from 1 or 2 hours to 13 weeks.

Lending Library: Free Lending Library of Video and Audio materials. Materials available for 1st Grade to professional scientist.

Reference Library: Students writing papers may wish to do research in the CSA reference library which contains a growing number of "Politically Incorrect" books, as well as some early works by Darwin, Lyell, et al.

Lost Video Announcement

The following videos have been loaned out and not returned. They are marked with a **CSA Lending Library** Label.

Distinctively Human, Crossroads Creation Series #1, World of Living Fossils by John MacKay, Understanding the Times, #22, "Challenge to Christians in the '90's" by Dr. David Nobel

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CSA Meeting Tuesday, Sept 6, 1994

The Basic Institute in Creation Science

The Wonders of God's Creation: The Animal Kingdom

by: *Questar Productions & Moody Institute of Science*

Reviews the incredible design, entertaining and fascinating features of Archer Fish, Monarch Butterflies, Bats, Pacific Salmon, and others. A fascinating video production, suitable for all ages.

The Advanced Institute in Creation Science

The Age of the Earth

A Video from the International Conference on Creation
by: *Ian Taylor*

Ian Taylor, author of the lead article in this issue and the book *"In the Minds of Men,"* is a thorough historian. In this paper he explores some of the strategies used by the founders of uniformitarian "science" to convince people that the earth was older than the Bible implies. A fascinating session to begin a series on geology in the Advanced Institute.

CSA Meeting Tuesday, Oct 4, 1994

The Basic Institute in Creation Science

Evidence for Design in Nature

A Beautiful Slide Presentation

by: *Jim Henderson*

Jim Henderson teaches biology in KC area colleges and specializes in botany. He has been a commercial orchid grower and has traveled widely photographing his favorite subjects. An ideal sequel to the September meeting. Beautiful photographs, fascinating discussion. Suitable for all ages.

The Advanced Institute in Creation Science

A Tectonically Controlled Rock Cycle

A Video from the International Conference on Creation
by: *David Tyler*

Continuing our study of "Uniformitarian Geology" versus the facts of geology, this paper introduces rapid plate movement as a major force in rock formation. Much more evidence will come out in subsequent sessions.

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Subscription rates: No Charge to those requesting.

Gift subscriptions: \$10 per year.

CSA Institute/Meeting Location: Westbrooke Church

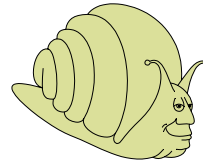
9898 West 95th, Overland Park, KS

Refreshments: 6:15PM - Meeting: 7:00PM

Nursery Provided (Reservations required): \$2.50 per child

Two blocks East of 69 Highway (or Switzer) on North side of 95th Street. Call (816) 658-3610 for nursery or for more information.

Did you know... CSA meetings are free, entertaining,
educational, and useful in evangelism?
If you haven't been coming, you should be.



Creation Safaris

August 12 (13) - 8:00 PM - Astronomy Outing, Perseid Meteors

August 27 - Kansas City Zoo - A family outing to the zoo that honors the creator of the animals rather than a 19th century philanderer.

September 9 (10) - 7:30PM - Astronomy Outing, Venus & Saturn

September 24 - KATY Trail Bike Trip - Canceled in '93 due to the flood, come with us this year and see the millions of fossils made by the great flood of '93.

September 30 - 7:00PM - Astronomy Outing, emphasis: Saturn

Oct 14,15 - Ozark Cave Outing - Overnite in rustic cabins, campfire, Smores, worship, hymns, hiking, visit two caves... great family outing.

Oct 28 (Nov 4) - 7:00PM - Astronomy Outing, emphasis: Saturn

November 12 - Squaw Creek Game Refuge - Migration, Bald Eagles, Geese, Ducks, Deer, Hiking, Picnic, Devotion, Seminar

December 13 - 7:00PM - Astronomy Outing, Gemenid Meteor Showers

Important Safari Note: CSA does not charge for safaris. However, some of the places we visit **do have entrance fees, and we do request that you make safari reservations so we can plan properly.** To make reservations, call (816) 658-3610. To find out safari details, request a copy of the brochure: "**1994 Detailed Safari Information,**" which will give you costs, meeting place, time of departure and return, what to bring, safari registration information, etc.

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