Are Geologic Strata the Result of the Biblical Flood?

Many people who revere the Bible, both in the Church and outside, assume that most of the earth's sedimentary strata were formed by the Flood at the time of Noah. Is this really the origin of the earth's strata?

Or are earth's strata the result of two floods: one at the time of Satan's rebellion and another at the time of Noah?

Is it possible that the earth's sedimentary strata are not the result of catastrophic, worldwide floods at all?

In the past we proposed various explanations. We now have adequate information to indicate which of these explanations were right and which were wrong. We will examine the strata and find what is revealed about their origin.

Importance of this subject

Why should this question be important to us? Why should we care how strata were deposited?

This issue is central to an accurate understanding of both the age and history of the earth. It is a major key to understanding the history of life on the earth and how God went about creating it.

In addition, evolution, the leading philosophy of the modern world, influences how hundreds of millions view the purpose and value of human life. Understanding the claims of evolution requires understanding how the earth's strata were deposited.

This is not a mere exercise in academic trivia. It is a key question for anyone who must deal with the realities of the history of the earth and the life forms that have lived on it.

In the 17th and 18th centuries, before the rise of evolution, many religious people rejected the then new understanding of the true structure and size of the physical universe because it contradicted their traditional understanding of the Bible and some of their other religious biases. They were unwilling to look at the facts and adjust their understanding of the Bible *in the light of* those facts.

Traditional creationists today are now facing a similar situation. However, today the issue is the history of the earth and of life on it, not the nature and structure of the universe.

A major aspect of this issue concerns how the strata of the earth were deposited. In this article we will look at some of the physical evidence found in the strata to determine their mode of deposition.

If they were deposited rapidly, under a worldwide mantle of water, they will have certain characteristics because of that environment.

If, on the other hand, they were generally deposited in noncatastrophic, ongoing environments, they will show characteristics of those environments. This latter situation is what we find for most strata in the geologic record.

We will examine seven lines of evidence that clearly show that many strata were not deposited rapidly (such as under presumed flood conditions). These seven factors were selected because they present simple and straightforward evidence that will be clearly understandable to the nonspecialist. There are many other evidences that could be used.

These seven are by no means exclusive. They seem, however, to be the best for our purpose and audience.

Limestone structures built by living algae

First we will consider one of the most obvious indicators that strata were deposited over a long time period during which life continued its normal operations. Some species of algae precipitate layers of lime (calcium carbonate) on the surface they are attached to. As these small particles of lime build up, they form structures that take on a variety of shapes, but all show a characteristic pattern of concentric layers or "laminae."

Two common examples of the resulting structures are illustrated in Figure 1. Structures similar to these are found in many strata throughout the geologic record, from very young strata to some of the oldest in which abundant remnants of life are found. Though these strata were deposited in water, the

evidence is clear that they were not deposited rapidly, under flood conditions.

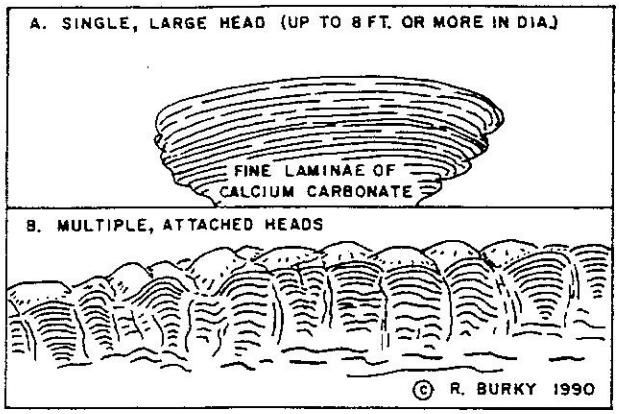

Figure 1. Close-up detail of two types of algal limestone structures commonly found in strata. They vary in both vertical and horizontal dimensions from less than an inch up to many feet.

Coral reefs are often made up of a large quantity of limestone deposited by algae as well as that deposited by coral polyps. Most limestones deposited directly by algae have the characteristic undulating pattern of bands, or laminae, that allows their origin to be readily identified.

When these telltale structures are found interbedded with marine or lake strata, it is clear that the strata were deposited under normal life conditions. Algae were living and precipitating lime while surrounding sediments were being slowly deposited. Figure 2 shows an example of how these algal structures are found in strata.

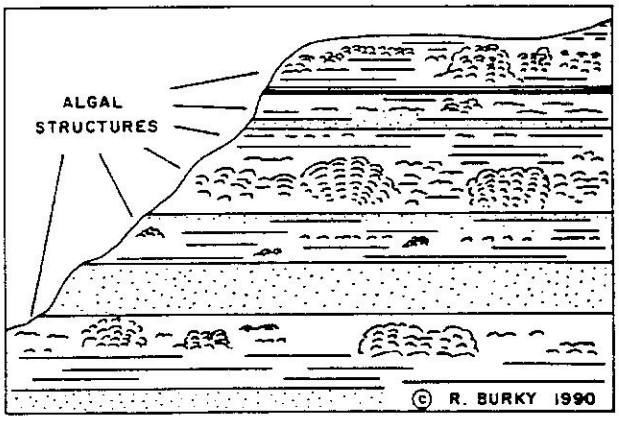

Figure 2. Cross section of strata illustrating how algal limestone structures are often interbedded with the strata.

In some strata, limestone deposited in this manner reaches a thickness of 60 feet or more. This would certainly take hundreds, if not thousands, of years at the rates of buildup normally experienced in modern situations. Clearly such deposits were not formed under flood conditions in a year or two. They are not rolled or turned upside down, nor do they show evidence of being deposited by swift moving currents. They are in growth position and location.

Standing, fossilized tree trunks

Though far less common than algal limestone, standing tree trunks are a clear indicator of at least tens of years having passed during the deposition of the sediments in certain strata.

In the middle of some strata, and even at different levels within some of them, are found standing fossil tree trunks. The roots of these fossil trunks are firmly attached to the underlying sediments that had been deposited prior to the growth of the trees and into which the roots grew. Enough time passed for large trees to grow before they were covered by overlying sediments.

Some have been found over 15 feet in diameter. Many are found one or two feet in diameter. Figure 3 illustrates this situation.

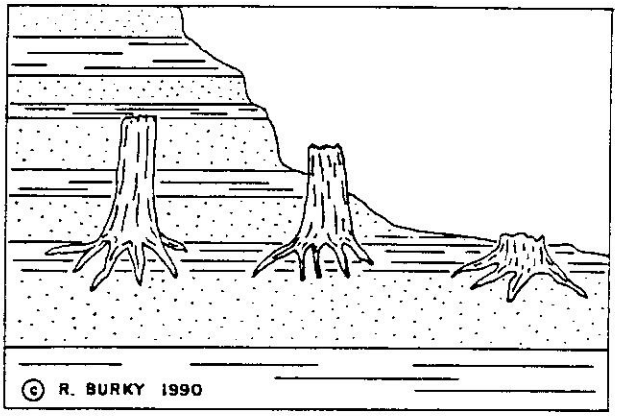

Figure 3. Strata containing fossilized tree trunks that have been buried at their growth location and in growth position.

Floods may indeed have deposited the sediments that covered the tree trunks to fossilize them. But this is usually less than 20 feet of strata in a sequence of strata that may be hundreds or even thousands of feet thick. Some strata contain multiple layers of standing trees.

Salt deposits

Common table salt, sodium chloride, is often found bedded in sedimentary strata. Under flood conditions dissolved salt would be carried away and dispersed in the waters, not deposited with other sediments.

The quantities of deposited salt that are often found would require large amounts of seawater to have been evaporated to concentrate such thick deposits. These deposits are not on top of all other strata, as you would expect if they were the result of "leftover" floodwater evaporating. They are in the middle of strata sequences with strata deposited above and below them.

Salt is not the only soluble mineral found in strata resulting from evaporation. There are many others: potash, trona, borax, epsom salts. One other mineral in this category that we should consider is gypsum (calcium sulphate). Many of us would be familiar with this mineral because of its use in making wallboard for home construction. It is even more commonly found in sedimentary strata than salt.

Tremendous deposits of gypsum are common in the sedimentary strata of the American West. Gypsum, like salt, can be concentrated and precipitated by the evaporation of sea water. Under flood conditions it, too, would be carried away in solution and widely dispersed, not concentrated and deposited in layers in sedimentary strata.

Fossil oyster beds

A fourth example of strata being deposited over time and with natural living conditions going on at the same time is fossil oyster beds. These are found in numerous localities in the western United States in strata that have been deposited in shallow marine environments. The beds are often 10 feet or more thick. Sometimes the beds are composed of nearly 100 percent oyster shell. They typically contain only one dominant species of oyster.

It seems clear that the shells are buried where they lived. They are not indiscriminately mixed with other species of oysters or other shells. Nor are they worn by being transported from distant locations. One would expect such mixing and wear if they were tumbled and buried by floodwaters. An example of an outcropping of such a bed is shown in Figure 4.

Some oyster beds are so thick and contain such pure deposits of oyster shells that they have been used in place of gravel to surface roads. In different beds, different species of oysters dominate. This situation would only be caused by natural living conditions. It would be impossible for it to occur as a result of any selective sorting action of floodwaters.

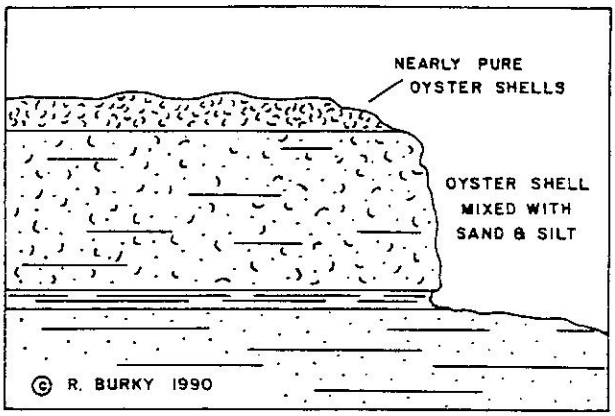

Figure 4. Fossil oyster bed with only one type of oyster, the genus *Gryphaea.*

Fossil animal tracks

Throughout the stratigraphic record are found many strata that contain tracks of land animals. If the earth were covered with water it would be impossible for land animals to be walking around and making tracks.

Fossil mud cracks

In a similar way, fossil shrinkage cracks are found throughout the geologic record in strata that have been deposited on land (as opposed to those deposited in lakes or in the sea). They are very common features of the geologic record. They are formed when mud dries out and produces characteristic cracks that are then rather quickly buried by another layer of sediment.

This only occurs on a land surface that is subjected to periodic times of drying. They are certainly not formed underwater. Some strata contain layer upon layer of fossil mud cracks. They often occur over and over in many vertical sequences of strata. Frequently they occur with animal footprints preserved in a manner similar to the mud cracks.

Fossil deserts

Some strata were not laid down by water at all, but are deposits of wind-blown sand. In southern Utah, 2,000-foot-thick strata were deposited in this manner.

There are characteristics common to wind-blown deposits. Fine-grained particles have been winnowed out of the larger sand grains. The grains are of more

uniform size and more rounded shape than are sand grains deposited under lake or marine conditions. The bedding structure is considerably different as well as the type of fossils found in the strata.

The contact between the sand and the underlying strata is often sharp and clear-cut. This is especially true where layers of mud are found underneath wind-blown sandstones. If the sand had been deposited by water, you would expect the mud and sand to be thoroughly mixed together. It is not. Clearly the sand was blown onto the mud, deposited by wind rather than water. Figure 5 portrays an outcrop from the Grand Canyon of Arizona that illustrates this situation.

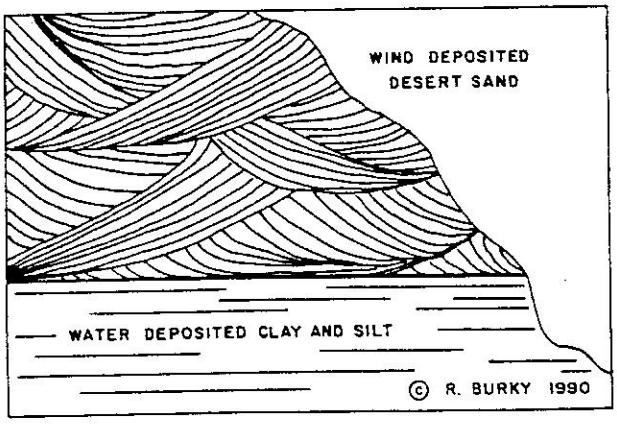

Figure 5. Wind-deposited sand lying on water-deposited mud. Note the difference in sedimentary structure and the lack of mixing at the boundary between the two.

The fossils found in such desert strata are generally limited to animal tracks. These strata are definitely not deposited under flood conditions.

Other factors

The factors we have considered clearly indicate that much of the earth's strata was deposited over an extended period of time, under nonflood conditions. One could cite additional factors like fossil soil layers showing that weathering and soil-forming processes had occurred at multiple levels in some strata.

One could also cite weathering and erosion surfaces between strata showing that there was a time break between the deposition of the two strata. The buildup of fossil coral reefs in marine strata is another. There is much additional evidence, but the evidence already given should be sufficient to prove the point.

Conclusion

It is clearly a mistake to consider the strata of the earth's geologic record to be the result of one, two or a number of cataclysmic, destructive floods. The physical evidence overwhelmingly shows that this is not the case. It shows deposition going on over extended periods of time and in many different environments. The earth has been around for a long, long time, in water and out.

This does not imply that the Flood mentioned in the Bible didn't happen. It means that the effects attributed to the Flood by some are in error.

The Bible nowhere states, or even implies, that the earth's strata are the result of floods. Concluding that they are is an error due to improperly understanding the physical evidence. If we fail to recognize this error, we will draw a grossly distorted picture of the earth's history. And we will fail to appreciate the rich understanding that can be obtained by correctly deciphering the geologic record. We may even lay a stumbling block before some if we insist that the Bible teaches something that is in direct contradiction to the physical evidence.

Does the existence of extensive time periods before Adam give more credence to the concept that mindless evolution is responsible for the creation of life forms? Absolutely not! But it forces us to expand our concepts and understanding of how and when earlier life forms were created. We must learn to understand the few biblical references to geological phenomena in the light of the true geologic record, not force a biblical meaning that is contrary to that record.

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