

Is the geological column a global sequence?

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Creationist geologists are not yet agreed over whether the geological column represents an exact sequence of Flood events or not. Local stratigraphic sections seem to line up with the general order of the geological column at hundreds of locations around the world. But there are many problems with the details. For example, 1) the geological column is a vertical or stratigraphic representation abstracted from rock units that are mainly found laterally adjacent to each other in the field, 2) new fossil discoveries continue to expand fossil stratigraphic ranges, 3) different names are given to the same or a similar organism when found in “different-aged” strata, 4) taxonomic manipulation, 5) anomalous fossils, and 6) out-of-order fossils. These problems mean that geologists should be cautious about how they relate the geological column to the Flood.

The question of how the geological column fits into Flood geology and the order of events before, during, and after the Flood is quite controversial within creationism. Some creationists advocate that the geological column is an exact representation of the events of the Flood and possibly post-Flood deposition, minus the uniformitarian timescale. In other words, the Cambrian is early in the Flood, followed by the Ordovician, etc., all over the world according to the exact order of the geological column. In that scheme, Mesozoic would be considered middle Flood or late Flood, depending upon where one places the Flood/post-Flood boundary, and the Cenozoic would be either late Flood or post-Flood. Is this claim true or just taken on faith?

How was the column developed?

To demonstrate that the geological column is a global sequence, four steps are necessary: (1) develop local columns for small areas, (2) tie local columns into a regional-or subcontinental-scale column, (3) integrate local and regional columns into a continental-scale column and (4) develop the overreaching global geological column. Presumably the first and second steps could be fairly straightforward, if the geology is uncomplicated and the lithology of the strata can be traced for long distances. But, in areas of tectonics, overthrusts, and facies changes, the development of even a local column may be difficult or nearly impossible. The third and fourth steps become much more difficult since lithologies and fossils cannot be traced across continents and from continent to continent. It would seem that the task grows by orders of magnitude at these last two stages, becoming more hypothetical the greater the area of extrapolation. Woodmorappe noted:

“As one moves from local all the way to global correlation by fossils, correlations become increasingly less empirical and more conceptual.

This is because there are progressively greater differences (such as lithology, local fossil succession, and overall faunal character) as one moves even further geographically from a reference section in the type area.”¹

The geological column was first developed at a local or regional scale before it was extrapolated to a global scale. The geological column was first set up in England, the Alps of Europe, and the Ural Mountains of Russia based on a number of assumptions.² It is possible that the formations in England may be well-behaved vertically and horizontally (but this should be checked), so that the part of the column developed in England may be generally accurate. I question how well the Alps and the Permian from the Ural Mountains fit into the original geological column because of their distance from England.

Although it is claimed that evolution was not a guiding principle for the construction of the geological column in the early 1800s, the formations were nonetheless pigeonholed into slots based on *fossil succession*. In other words, the original column was not necessarily developed from lithology but mainly by a succession of index fossils. Index fossils are organisms that are assumed to have spread over much of the world and lived only a short time. Yes, “catastrophists” generally developed the column, but these catastrophists believed in multiple catastrophes in which the Genesis Flood was just the last and accounted for only the surficial “diluvium”. Some of these catastrophists would be considered progressive creationists today, but others eventually succumbed completely to uniformitarianism. Fossil succession over long periods of time was the guiding principle, which essentially is the same as evolution. When biological evolution came on the scene, fossils succession became evolutionary progression with time. As it later turned out, much of the “diluvium” was the result of glaciation. So, the Genesis Flood, after first being relegated to producing only the surficial layer, was then rejected entirely by most scientists in the 1800s. Some scientists and theologians held onto a local or tranquil flood, although Scripture is abundantly clear that the Flood was catastrophic and covered the entire earth.

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Many people believe index fossils were supplemented by radiometric dating in the 1900s, but index fossils continue to have preeminence in dating. Radiometric dates *must agree* with the geological column, or the radiometric dates are assumed wrong (or reinterpreted) for various reasons.³ As a result of this circular reasoning, there are countless problems in radiometric dating.^{4,5} A new creationist research project, called RATE (Radioisotopes and the Age of the Earth), has shown that in some instances the millions or billions of years are very likely the result of accelerated radiometric decay on a young earth.⁶

Even if the fossil succession is more or less accurate for England, the question of the validity of the geological column really boils down to how well the original fossil order from England represents a worldwide order. This question must be answered empirically. The literature indicates that a general order seems to exist but problems occur in the details. This does not imply that an evolutionary order exists, but it is a burial sequence during the Genesis Flood.

Local columns show general order

The justification for the global column is that the small number of index fossils in any one area still line up vertically in their expected order. Of course, creationists should verify this vertical order, especially in view of the problems discussed below.

Trilobites and dinosaurs, organisms from different environments, illustrate the concept of a vertical fossil relationship. If every outcrop shows dinosaurs always superimposed above trilobites, we can have general confidence that this relationship holds as a worldwide relationship in the Flood. Furthermore, if we find a region with just trilobites, we can surmise that the strata were laid down earlier than strata containing dinosaurs in another region. Because of the many problems listed below, there may be exceptions. So, in this case dinosaurs above trilobites would be considered a general Flood order.

Dinosaurs and trilobites lived in quite different environments, and we would expect that to be reflected in the vertical order of their fossils in the Flood.

However, I would be more cautious in developing a vertical order with organisms from the same or similar environments, such as various types of trilobites, cephalopods, foraminifers, diatoms, etc. They mostly live in a marine environment and during the Flood could have become vertically superimposed in any order, unless there were other factors that could cause systematic vertical relationships, such as ecological zonation, horizontal separation, etc.

The general order of the geological column (Paleozoic below Mesozoic below Cenozoic) seems to be correct on a broad scale in north central Wyoming and south central Montana.



Figure 1. Tilted Paleozoic and Mesozoic strata at the northwest edge of the Bighorn Basin at Clark Canyon adjacent to the southeast Beartooth Mountains.



Figure 2. The erosional remnant of Red Butte on the south rim of the Grand Canyon (view west from Forest Road 320).



Photo courtesy of Tom Vail

Figure 3. Unique erosional forms in Claron Formation of Bryce Canyon National Park.

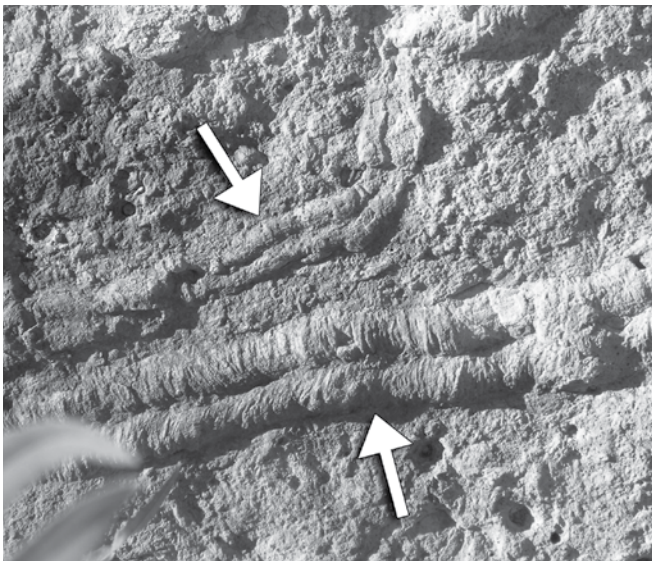


Figure 4. Trilobite tracks from the Grand Canyon (arrows).

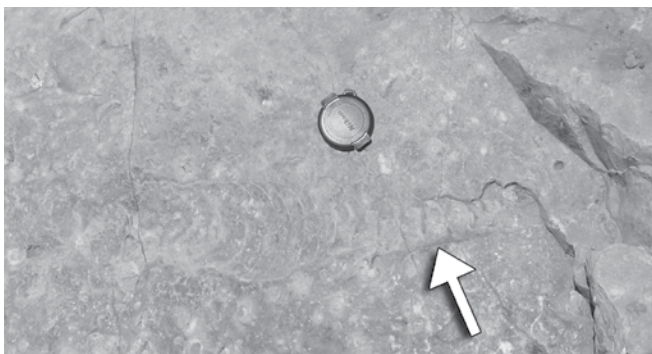


Figure 5. Nautiloid from the Grand Canyon.

Paleozoic strata with trilobites, brachiopods, etc. and Mesozoic strata with dinosaur fossils are commonly found in the mountains, while Cenozoic strata with fossil mammals predominantly occupy the basins and valleys. Paleozoic and Mesozoic strata are often tilted at a high angle at a basin edge against granite intrusions and uplifts of sedimentary rocks in the northern Rocky Mountains (figure 1), while the Cenozoic strata are nearly flat-lying in the center of the basins. The uplifted Bighorn and Beartooth Mountains and the Bighorn Basin in between are a good example. The Cenozoic strata of the Bighorn Basin and the adjacent Clarks Fork Basin to the north are well known for their fossil mammals. These Cenozoic basin fills postdate the strata in the surrounding mountains. Assuming that the Paleozoic and Mesozoic have typical index fossils for those periods, the order of the fossils lines up with the geological column in this area.

Another example is the Grand Staircase in northern Arizona and southern Utah. Although the Grand Staircase is both a vertical and horizontal relationship, in that the Mesozoic strata lie predominantly to the north of the exposed Paleozoic strata of Grand Canyon, there is strong evidence that the Mesozoic strata once lay above the Paleozoic Grand Canyon. The Mesozoic strata were later eroded, leaving remnants such as 300 m-high Red Butte along the southeast rim of the Grand Canyon (figure 2). However, I would question the Cenozoic age of the Wasatch Formation on top of the Mesozoic section in Utah. I believe this formation was assigned to the Cenozoic based on the assumption that strata on top of Mesozoic must be early Cenozoic, and since the Wasatch Formation crops out in basins to the north, the top strata likely were simply rubberstamped as the Cenozoic Wasatch Formation. However, the top formation of the Grand Staircase is no longer considered to be the Wasatch Formation; it is the Claron Formation.⁷ However, the Claron Formation is still considered to be early Cenozoic.

The unique erosional forms of Bryce Canyon were carved in the Claron Formation (figure 3). Fossils in the Claron Formation are not abundant,⁸ so it is unlikely that fossils can be used to determine its age. If the formation was actually “Mesozoic”, then only two of the three Phanerozoic eras of the geological column are represented in the Grand Staircase.

I question the finer time divisions within the Paleozoic or Mesozoic, such as the division between the Cambrian, Ordovician, Silurian, etc. The Paleozoic commonly contains marine deposits (one exception being the claim that the Coconino sandstone is a desert deposit, which is debatable). The environmental interpretation is based on marine fossils such as trilobite tracks (figure 4) and nautiloids (figure 5) found in the Grand Canyon and at other locations. It is likely these organisms lived before the Flood, and so the Paleozoic represents a marine burial sequence, possibly by ecological zonation. Between the Cambrian Muav

Limestone and the Devonian Temple Butte Limestone, the Ordovician and Silurian periods, with their 120 Ma of geological time, are missing. The contact between the Muav and Temple Butte is a disconformity, a break in deposition or an erosional event between parallel beds. Figure 6 shows a fold at the disconformity, implying little if any time gap, because the lower limestone formation should have already been lithified and thus could not have been folded parallel to the upper formation. If the geological column is an exact Flood sequence, this disconformity would represent a period of erosion or nondeposition between the Muav and Temple Butte Limestones during the Flood. However, if the geological column is merely a general order, there is no reason to suggest a period of nondeposition or erosion between the two limestones. The specific index fossils for those

periods simply were not deposited. I might add that the Ordovician and Silurian are also considered absent in practically all of Montana,⁹ likely because of missing index fossils. If someone found an index fossil for the Ordovician, you can be sure that strata now labeled Cambrian or Devonian would become Ordovician or Silurian.

Reed¹⁰ advocated that creationists with geological knowledge become familiar with the geology and paleontology of their local area for eventual regional scale investigation. We can focus just on the rock record and develop our own local geological columns. In this way we would be able to analyze the rock record from each local area and relate it to a global Flood model.

Problems for the geological column

Despite propaganda by evolutionary and uniformitarian scientists that the fossil order is an exact global order with time, there are numerous problems and anomalies that make this assertion questionable. I can only briefly mention these problems, since they could be amplified into a whole book.

1) Vertical sequence of geological column is often horizontal in the field

Many think that the geological column is a vertical, onion-skinned model, which has the same vertical sequence in most areas. Actually, the vertical fossil scheme is mostly derived from lateral relationships. The reason for this is because only a small number of the ten Phanerozoic geological periods are represented as a vertical sequence in any local area, defined for analysis purposes by



Figure 6. Disconformity between the Muav Limestone and Temple Butte Limestone in the Grand Canyon. Notice how folding affects both formations.

Woodmorappe as a 406 by 406 km square.¹¹ Two-thirds of Earth's land surface has five or fewer of the ten geological periods in place. Only 15–20% of Earth's land surface has even three geological periods in correct consecutive order. This is a conservative estimate in favor of the geological column because Woodmorappe used any suggestion of a period being in a square as evidence that the period existed in that particular square. His squares are so large that it was difficult to establish a single vertical sequence because of tectonics, facies changes, etc., and many of these local geological columns should be verified lithologically. Regardless, the global and continental columns mainly represent a horizontal sequence. Unless there are better empirical correlations, it may be difficult to know the exact time sequence in the Flood over such large areas.

For instance, the late Paleozoic is well represented by coal from trees such as lycopods in the Appalachian Mountains, while in Montana and Wyoming the coal (figure 7) contains angiosperms and gymnosperms. The coal in Montana and Wyoming is dated as “early Cenozoic”, much younger than the Appalachian lycopods in the geological column. But, the different trees really represent a horizontal separation. Whether or not the different plants making up the coals represent a time sequence in the Flood must be determined empirically.

The horizontal relationship of index fossils is also a global phenomenon.¹ In a study of 34 index fossils, Woodmorappe found that only rarely are more than a third and never more than a half of these index fossils simultaneously present in any 320 km-diameter region on



Figure 7. Part of Wyodak coal seam just east of Gillette, Wyoming.

Earth. And even those index fossils found in a particular region are rarely vertically superimposed.

The problem is that it is doubtful enough that these local relationships can be traced horizontally to know whether the global geological column really represents a vertical sequence. For example, the coals from the Appalachians and from the Montana/Wyoming area could have been laid down at the same time in the Flood.

So, the global geological column is built by extrapolating periods and index fossils from each area into a global sequence. How well this global sequence lines up with reality and represents a Flood order requires much more research, but I am skeptical that each period in the geological column represents a consistent part of an absolute sequence of events in the Flood model.

2) Changing fossil ranges in the geological column

In order to discuss fossil order, we need to know the three-dimensional distribution of fossils. Fossils come from scattered outcrops and boreholes. We know very little of the subsurface distribution of fossils. The more scientists examine the rocks, the more the *ranges of fossils are extended* in the geological column.¹²

For instance, organisms thought to have been extinct for millions of years sometimes are found alive in remote locations on Earth. These organisms are called living fossils. Logically, these organisms must have lived during later geological periods where their fossils have not been discovered. If this applies to many other organisms, fossil ranges for many organisms can be greatly extended *upward* toward the present.

One of the most recent outstanding examples of a living fossil is the Wollemi Pine (figure 8), found in a gorge in the Blue Mountains, 200 km west of Sydney, Australia.¹³ The Wollemi Pine was thought extinct since the Jurassic period—about 150 Ma ago on the uniformitarian timescale. This means that the Wollemi Pine should exist in strata between the Jurassic and the present. One researcher described the



Figure 8. Wollemi Pine from Blue Mountains of New South Wales.

discovery like “finding a live dinosaur”.¹³ Obviously, no evolution of the Wollemi pine has occurred for an alleged 150 Ma. Given its absence in strata younger than “Jurassic”, those 150 Ma may never have existed. One would expect abundant Wollemi pine fossils during this 150 Ma period. Catastrophic burial about 4,500 years ago is a better explanation for living fossils, such as the Wollemi pine.

A sponge, called *Nucha? vancouverensis sp. nov.*, was found in the upper Triassic of Vancouver Island.¹⁴ Surprisingly, this sponge is nearly identical to one previously found only in the Middle Cambrian of western New South Wales, Australia, which was named *Nucha naucum*.¹⁵ The fossil has not been found in strata within the supposed 300 Ma intervening years. Assuming that the paleontological analysis on these sponges is correct, the range of *Nucha* is significantly expanded upward in the geological column, and one wonders whether the 300 Ma between the Cambrian and the Permian are real. The above situations are not rare.¹⁴ These examples should make us aware that paleontologists do not know the three-dimensional distribution of fossils, and that the many millions of years between the same or similar fossils may not exist.

Fossil ranges have also been extended *downward* in the geological column. For instance, vertebrates have been pushed back into the Cambrian^{16,17} where 50% to possibly as high as 85% of all phyla originated in what is now called the Cambrian Big Bang.¹⁸ Sharks have been pushed back 25 Ma into the Late Ordovician.¹⁹ Vascular plants have also been pushed back 25 Ma into the Early Silurian.¹⁹ Based on tracks, arthropods invaded the land 40 Ma earlier (Late Cambrian) than previously thought.^{20,21} The discovery of a possible winged insect would push back the origin of winged insects and flight by more than 80 Ma into the early Silurian, which in turn has caused the supposed first land plants to be pushed back into the Ordovician.^{22,23}

If their analysis of organic molecules is correct, evolutionists believe that they have pushed back the origin of eukaryote cells 1 to 2.7 Ga ago in the late

Archean.^{24,25} This raises interesting questions for both evolutionists and creationists. Where are the remains of all the billions of organisms with eukaryote cells that lived between 2.7 Ga ago and the time of the Cambrian Big Bang (500 Ma ago) in the evolutionary model? Since the molecules were found in sedimentary rocks, does this mean that Archean and Proterozoic sedimentary rocks are from the Flood?

3) Different names for the same or similar fossil from different ages

It is not an uncommon phenomenon to find the same or similar fossils in strata of different ages that have been given *different names*. Very few non-specialists would be aware of this phenomenon. This practice masks the true range of fossils within the geological column. Tosk²⁶ documented that the same or similar foraminifera are not only given different names when found in strata of different ages, but also are sometimes placed in different superfamilies. Woodmorappe²⁷ found that much of the stratigraphic order of cephalopods is due to time-stratigraphic concepts and taxonomic manipulation. Both cephalopods and foraminifera are important index fossils.

The same situation occurs with plants. Rees *et al.* complain:

“Indeed, it is sometimes necessary to ‘side-step’ traditional paleobotanical taxonomy, which is often hindered by political and regional biases (ensuring a highly specialized local but limited global view), as well as stratigraphic biases (with what is effectively the ‘same’ fossil plant type being assigned to a different genus or species depending upon its age).”²⁸

4) Taxonomic manipulation

Another problem mentioned by Woodmorappe²⁷ is that slightly different features in cephalopods have been used to date a layer of strata to a different age. These slightly different biological features cause one type of organism to be split into a different species, genera, families, etc. Since taxonomic splitters have had the upper hand in taxonomy, how meaningful are such taxonomic and age manipulations to the geological column? We know that species of living organisms, like dogs and pigeons, have a great morphological variety. How do we know whether the variety found in an extinct organism is not from intraspecies variation? Within creationist biological terms, such variation would be considered within the same Genesis kind or *baramin*.

For example, one type of trilobite might date a layer as Cambrian while a slight change in anatomy in another trilobite in another layer will cause that particular layer to be dated as Silurian. Are they different kinds of trilobites or variations within one kind?



Figure 9. Lewis “overthrust” (arrow) northeast of Marias Pass, Montana (view northeast). The “Precambrian” Albyn Dolomite is the light colored layer in the center of the picture while the Appekunny Argillite is the dark colored rock above. “Cretaceous” shale lies below the dolomite. Note the horizontal beds of the shale, which are either undeformed or only mildly deformed below the contact.



Figure 10. The contact of the Lewis “overthrust” northeast of Marias Pass.

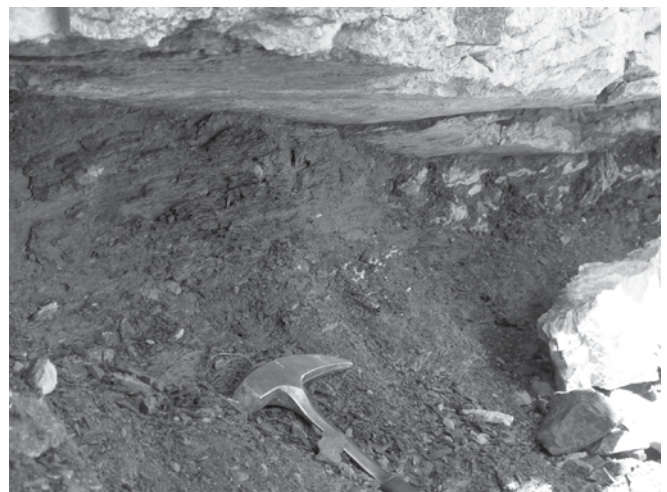


Figure 11. Close-up of the contact of the Lewis “overthrust” northeast of Marias Pass. There are stringers of Albyn Dolomite in shale below contact.

These problems make it difficult to take seriously the separation of the periods within the Paleozoic and Mesozoic. The Paleozoic may simply represent mostly marine deposition during the Flood. Trilobites buried at nearly the same time are assigned from the Cambrian to the Permian in the uniformitarian system. On the other hand, the organisms of the Mesozoic are much different, and generally above Paleozoic fossils where they are found vertically superimposed. So, the order of the geological column seems like a general sequence from a Flood depositional point of view, but with lots of exceptions in the details.

5) Anomalous fossils

Evolutionists often tell us that there are no contradictions to the evolutionary fossil order. However, they have to explain many anomalies in order to make the geological column “consistent”. One type of anomaly is finding two fossils of different ages in the same layer.

If the evolutionist cannot extend the stratigraphic range of the fossils, he must determine which fossil represents the true “age”. If the strata are considered young, the “old” fossil is simply assumed to have been “reworked”, eroded from “much older” strata and incorporated into younger sediments. Often, their only criterion for reworking is an expected evolutionary order rather than the condition of the fossil. However, if “old” organisms are reworked into “young” strata, wouldn’t the “old” fossil be pulverized?

In the opposite case, a “young” fossil is found in “old” strata, and evolutionists assume that the “younger” organism was buried within “old” sediment and fossilized. This is called “downwash”. This could happen if a “young” organism became trapped and fossilized in a cave, sinkhole, or bog within “old” sediment or sedimentary rock. If the strata remain unconsolidated until after the “young” organism is buried, it would be difficult for the “old” organism to have remain unfossilized for millions of years.

Whether a fossil is considered reworked or down-washed should not depend on preconceived ideas about age or fossil succession; there should be evidence for such an event.

Woodmorappe²⁹ compiled 200 published instances of anomalous fossils from the literature. This was not an exhaustive search. Most of these instances involved microfossils, which is why I am especially skeptical of the biostratigraphy of various microfossil groups, such as foraminifers and diatoms. Taxonomic manipulation, along with reworking, casts doubt on the use of microfossils as index fossils. Anomalous fossil occurrences are not rare.³⁰ Furthermore, if evolutionists under-report examples of anomalous fossils, they may be quite common, while evidence for reworking or downwash is rare! It seems that reworking is just an *ad hoc* explanation to make the geological column “consistent”. The real impact of anomalous fossils would be to broaden the fossil range in the geological column, thereby reducing confidence in index fossils.

6) Out-of-order fossils

A second type of anomaly in the fossil record is the situation in which “older” fossils are found above rocks that contain “young” fossils. These out-of-order fossils are the opposite of the evolutionary hypothesis. Out-of-order fossils are considered “impossible” by evolutionists, and so are dismissed as the result of *overthrusting*. An overthrust involves “older” strata being pushed over “younger” strata at an angle less than 45°.

Robinson³¹ claimed that overthrusts are based on geophysical evidence and not out-of-order fossils. This is true for some, but the Lewis overthrust in Montana and Alberta (figures 9–11) was identified based on fossils. In the Lewis “overthrust”, Precambrian rocks supposedly slid tens of kilometers eastward up a low slope over “Cretaceous” rocks. There is a 900 Ma out-of-order time gap at the Lewis “overthrust”, and this time gap was first based on out-of-order fossils. Bailey Willis³² first hypothesized the “overthrust” in 1902 after he found “Precambrian crustacean shells” in the upper block above the “Cretaceous” strata. The Lewis Overthrust may or may not be a true overthrust, but the determination should be made by geological and geophysical methods and not by fossils.

Another famous example of an overthrust is the Heart Mountain detachment in north central Wyoming. It is not a true overthrust but the upper block actually slid down a slight decline and broke up into many smaller blocks. That is why it is now called a detachment fault. Heart Mountain north of Cody, Wyoming, is the most famous example (figure 12). The Heart Mountain Detachment is real and there is evidence for motion, such as broken rock at the detachment surface.³³ So in this case, there is a structural explanation for the out-of-order fossils.

A modern analog for the Heart Mountain Detachment³⁴ was discovered when large blocks of lava detached from Hawaii and slid into the deep ocean.³⁵ In the South Kona Landslide, one huge block broke up into large pieces, up to 700 m high and 11.5 by 7.5 km in area. It slid up to 80 km oceanward—the last 40 km over relatively flat ocean bottom. These blocks are larger than the Heart Mountain Detachment blocks. Most uniformitarian geologists believe that the Heart Mountain Detachment was catastrophic, occurring within a matter of minutes or hours.³³

In such cases, there is evidence of overthrusting or reverse faulting. A reverse fault is the case where a block is shoved up over other rock at an angle greater than 45°. I believe that there is evidence of thick-skinned reverse faults and even overthrusts. For instance, in some regions of the Bighorn and northeast Beartooth Mountains of south central Montana and north central Wyoming, granite has been pushed east or northeast up an approximately 30° slope.^{36,37} Such thick-skinned (granite is involved) overthrusts are supported by seismic profiles and wells

drilled on the eastern edge of the granite that pass into sedimentary rock.

The fault zone of the Beartooth thrust consists of 21 m of shattered granite above 37 m of severely faulted sedimentary rocks.³⁸ Such evidence should also exist with thin-skinned “overthrusts”, in which sedimentary rock is pushed over sedimentary rock. However, I have seen a number of overthrusts in Montana and southern Alberta where there is usually little or no evidence for displacements of km to tens of km uphill over a slope less than 45°.³⁹

Some “overthrusts” display a reversed metamorphic grade in which the upper block is more highly metamorphosed than the lower block. Metamorphism is supposed to increase with increasing depth. So, this is support for the overthrust concept in these cases. However, it is possible that the metamorphic grade associated with “overthrusts” could be chemically caused⁴⁰ or caused by the migration of heat and fluids during deformation.⁴¹ Overthrusts, if they are real, could possibly be explained by catastrophic underwater emplacements during the Flood. Creationists need a comprehensive analysis of overthrusts.

The fact is that there are hundreds of alleged overthrusts and they seem to occur in most mountain ranges of the world. Yet mountains are usually the few places to observe a thick vertical sequence and so one is forced to conclude that out-of-order strata are common. A real overthrust should show abundant physical evidence. Relying just on fossils is unreasonable. If these strata cannot be tied to a real overthrust, then the fossil distribution in the geological column is contrary to evolutionary predictions.

Conclusion

In order to show that the geological column is an exact sequence for either the uniformitarian or Flood paradigm one must first develop local and regional columns and then show that these have a continental and global consistency. However, the local columns, which are more empirical, become more theoretical and speculative as one extrapolates to larger areas.

As far as the broad arrangement of fossils is concerned, the geological column seems to be generally consistent where observed in vertical sections in the western United States. This gives some confidence that the general order can be applied elsewhere in the world.

But when we get into the fine detail of the geological column such as the divisions of the eras, there is much reason for skepticism, especially where the environment of the fossils is similar. At any one location, the geological column seems to be less a vertical sequence and more a broad horizontal sequence. This sequence is based on index fossils



Figure 12. Heart Mountain, northwest Bighorn Basin. The light colored strata at the top of Heart Mountain are “Paleozoic” limestone and dolomite, which lies on top of valley fill sediments (view north).

from scattered outcrops that likely are difficult to correlate lithologically. The validity of such fossil correlations is suspect because fossil discoveries continue to expand fossil ranges in the geological column. Furthermore, different names are given to the same or a similar fossil found in strata of different “ages”. Correct taxonomic classification would likely expand the time-range of fossils even more. All this makes the use of index fossils for dating within the fine divisions of the column highly suspect.

If the observed fossil distribution were the only consideration then the time-range of fossils would be expanded even further due to several other problems including taxonomic manipulations, anomalous fossils, and out-of-order fossils. The overall effect of these problems and the way they are treated by the paleontological community is difficult to quantify but there is no doubt that they result in an unwarranted reduction in the time-range of fossils. Without these problems the time-range for index fossils used to date strata would be even greater, making the fine divisions within the geological column even more questionable.

These issues and problems should make geologists cautious about applying the geological column to the Flood.

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