"Flat gaps" in sedimentary rock layers challenge long geologic ages

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"Flat gaps", generally known as paraconformities, are contacts within sedimentary sequences where layers of sediment representing many millions of years are said to be missing. Flat gaps are remarkably flat and the sedimentary layers either side of the gap are parallel and relatively thin compared with their enormous geographical extent. Over the alleged long periods of time indicated by the gap, erosion is expected to remove vast depths of sediment and produce a highly irregular land surface. Such evidence of erosion, however, is not found. Flat gaps are common throughout the geologic column and around the world. They are very difficult to explain within the long-age uniformitarian paradigm and severely challenge the concept of millions of years. On the other hand, flat gaps provide strong evidence for a young earth and are easily explained within the paradigm of the global biblical Flood, authenticating the truthfulness of the Bible.

The standard geologic time scale assigns millions to billions of years for the age of various sedimentary rock layers found in the crust of our earth. However, between these layers there are often subtle horizons that are interpreted to represent a break in the sequence of strata where sediments representing millions of years of deposition are absent. These subtle gaps severely conflict with the millions of years proposed by most geologists for the slow deposition of the sedimentary record. Rather, they suggest that the sedimentary layers formed rapidly as would be expected by deposition during the worldwide biblical Flood.

Expected erosion missing

The process of erosion is significant for understanding these gaps, and an outstanding feature of erosion is the highly irregular topography it usually creates as streams and rivers keep cutting deeper gullies, canyons, and valleys into the landscape. Even Australia, which tends to be very flat, has a lot of irregular topography in many areas. Erosion tends to produce highly irregular surfaces over most of our continents.

These gaps, between, and sometimes within the sedimentary rock layers, challenge the putative long geologic ages because the expected irregular erosion is missing. You must keep two things in mind about these intriguing peculiarities. First, there is a major gap in the layers because sedimentary rock layers that should be there are missing at these localities; secondly the layers below and above the gap are parallel and flat. To put it simply we are talking about *flat gaps*.

Geologists who believe in long geologic ages call these flat gaps *paraconformities*. If there is a little evidence of erosion, but the layers are still parallel to each other, they may use the term *disconformity*, and sometimes the term *nonsequence* is also used, but the terminology is ill defined. The term *unconformity* is rarely used for these gaps because it is a general term for all kinds of gaps in the rock record. Keep in mind that not all gaps in the sedimentary layers are flat, but a significant number are, and these widespread flat gaps pose a serious problem for the long geologic ages.

Layers are missing

At these gaps, a part of the standard geologic column that is found elsewhere is missing. The layers and their expected fossils are absent because they were never laid down at that locality. The dark layer at the right in figure 1, designated as "Distant layer … ", represents a layer missing

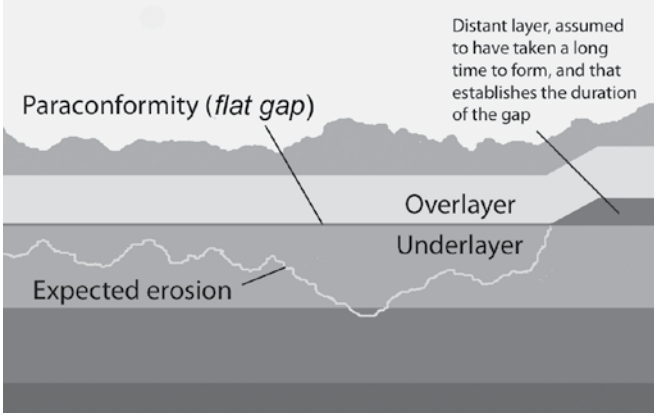

Figure 1. Diagrammatic cross section through sedimentary layers illustrating a flat gap or paraconformity. The paraconformity is the thin dark line in the middle of the diagram. Note the darker grey layer designated "Distant layer …" to the right that was laid down before the overlayer. Uniformitarian geologists assume that it would have taken a very long time to deposit the "Distant layer …", and the length of that time determines the duration of the gap between the underlayer and the overlayer. If it is assumed that it took 20 Ma to deposit the "Distant layer …", the gap is assumed to represent 20 Ma. The irregular white line in the underlayer illustrates the erosion that would be expected during such a long time, but the irregular erosion is essentially absent.

to the left of the illustration. Geologists use the standard order of the rocks and fossils in the geologic column to determine if there is a gap and what parts are missing. They assign the same length of time for the gap as the time they assume was required to deposit the missing parts.

The magnitude of the time involved is significant and can range from millions to hundreds of millions of years. This time is considered necessary for the slow deposition of the layers of the geologic column in other parts of the earth. The flat gaps are quite difficult to identify because often there is nothing there to indicate a gap. Sometimes just a line may be visible. Only by carefully comparing the order of the rock types and their contained fossil assemblages with other regions is a gap established.

Erosion should produce irregular surfaces

The problem these flat gaps pose for the long geologic ages is the lack of erosion of the underlayer. Over the many millions of years postulated for these gaps, you would expect pronounced irregular erosion as illustrated in figure 1 by the irregular pale line. The gaps should not be flat. In fact, according to average erosion rates, many or all of the underlying layers should be gone. The existence of flat gaps therefore indicates that the millions of years postulated for these gaps never occurred.[1] These flat gaps are so common that they pretty much challenge the validity of the whole geologic time scale.

How much erosion should we expect at these gaps? Rates of erosion can be determined by measuring the amount of sediment a river carries each year into the ocean and comparing that to the size of the river's basin. This has been done many times for all the major rivers of the world. The average of a dozen studies in the geologic literature[2] indicates that our continents are being eroded away at a rate of about 60 mm per thousand years.

It is estimated that current agricultural practices have doubled erosion rates, so prior rates would have averaged around 30 mm per thousand years, or 30 m per million years. This may seem slow, but when extended over an assumed 2.5 Ga age for the continents, this means that our continents could have been eroded to sea level over 100 times, but they are still here, suggesting that they are much younger. Renewal of the continental material from below, as proposed by geologists who believe in very long ages, does not seem to be a valid explanation for the presence of continents and mountain ranges. Many layers assumed to be very old are still on the continents, indicating that the geologic column has not been completely eroded even once.

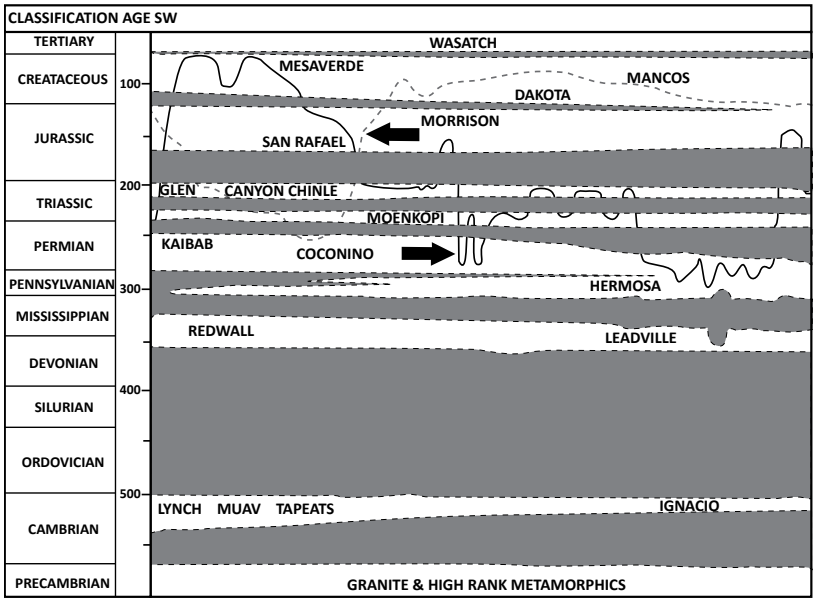

Figure 2. Representation of the vertical section through the sedimentary layers in eastern Utah assuming the standard geologic time scale. The assumed ages are provided in the second column from the left in units of millions of years (Ma). The white labeled layers are the rock layers that exist in the region, which actually lie directly on top of each other with essentially flat gaps between. The dark layers represent the gaps, and the thicker they are, the longer their assumed duration. The dashed and solid lines (black arrows) are examples of the present irregular eroded surface of the land in the region. Note the dramatic contrast between the irregular surface of the present landscape and the flat surfaces of the rock layers in the past (the white layers). The region represented is 133 km across, while the total thickness of the rock layers (white) is 3.5 km. Vertical exaggeration is about 14 times.[9]

An example near Grand Canyon

In figure 2 the sedimentary rock layers are represented according to the standard geologic time scale, but not especially their thickness, although time and thickness tend to be related. The standard geologic time is given in the second column in millions of years (Ma). The time assumed for the actual rock layers that are present is represented by the thickness of the white layers. The length of time missing in the putative gaps is shown by the thickness of the dark layers between the white layers. These white layers represent the various rock formations that actually lie directly on top of each other in the field. Note that, in general, the tops of the white layers represent the underlayer of the paraconformities,

Figure 2 is not a hypothetical example but represents a section in Utah, across 133 km that lies northeast of the world famous Grand Canyon. Superimposed on that diagram are a dashed line and a solid line (black arrows) that are two examples of the current eroded surface (topography) of the region. The dashed line is along an interstate highway and represents some of the flattest topography of the region. The solid line is the topography found further south.

Figure 3. Valley of the Colorado River viewed from Dead Horse Point in Utah. The arrows point to two gaps (paraconformities) of about 10 and 20 Ma each. Some 300 m and 600 m of erosion respectively could be expected in these timeframes. The canyon is 600 m deep. At the upper arrow the Middle Triassic is missing, while at the lower arrow part of the top of the Permian is missing.

Figure 4. Another view of the same 10 Ma gap seen in figure 3, however this is over 300 km to the southwest near Hurricane, Utah. The lower 20 Ma gap of figure 3 is also present here but lies just a little below the surface.

Notice the striking contrast between the flat pattern of the layers (especially the tops of the white layers), compared to the eroded highly irregular topography of the present surface of the region. This contrast illustrates the problem these gaps pose for the long geologic ages. If the many millions of years illustrated by the thickness of the black layers had actually occurred the configuration of the white layers should be highly irregular. They should be similar to the present topography of the region (solid and dashed lines). Because the white layers are so flat it means the millions of years suggested for the geologic column never occurred and that the layers were laid down one on top of each other without the postulated time intervals between. Furthermore, if geologic time is missing in one locality it is missing around the whole earth.

Gaps are not obvious

Sometimes paraconformities are so inconspicuous that they can be difficult to locate in the rock record. Famed paleontologist Norman Newell comments:

> "A puzzling characteristic of the erathem boundaries and of other major stratigraphic boundaries [boundaries between differing fossil assemblages] is the general lack of physical evidence of subaerial exposure. Traces of deep leaching, scour, channeling, and residual gravels tend to be lacking, even when the underlying rocks are cherty limestones … these boundaries are paraconformities that are identifiable only by paleontological [fossil] evidence."[3]

The inconspicuous nature of paraconformities can be seen in the examples of flat gaps shown in figures 3–11. The arrows point to the gap and the putative duration of the gap is indicated in millions of years (Ma). The legends give further information about expected erosion.

For instance, at the lower arrow of figure 5 of Grand Canyon there is an assumed gap of more than 100 Ma, because there both the Ordovician and Silurian periods and more of the geologic column are missing. According to average rates of erosion we would expect a 3 km depth of erosion during that time. Yet Stanley Beus, a geologist who has studied this area carefully, comments about the contact at that gap in the type area of the overlying formation, stating: "Here the unconformity [i.e. the gap or paraconformity], even though representing more than 100 million years may be difficult to locate."[4]

At the 14 Ma gap in the region of the tip of the middle arrow in figure 5 geologists Ronald Blakey comments: "Contrary to the implications of McKee's work, the location

Figure 5. Three gaps in the Grand Canyon in Arizona. Expected erosion is 180 m, 420 m and 3,000 m. The canyon is about 1,600 m deep. All of the Ordovician and Silurian and more are missing at the lower gap. In spite of their long duration, the exact positions of the lower two gaps are often hard to locate; nevertheless, the general parallel arrangement of the layers above and below indicate little or no erosion.

Figure 6. A major gap found in northeast Arizona between the Triassic Chinle Formation and the overlying Pliocene Bidahochi Formation. The Jurassic, Cretaceous and most of the Tertiary "periods" are missing. The gap is in a soft slope at the tip of the arrows. The paraconformity lies as a straight line between the very tips of the two arrows. The Bidahochi is a little lighter grey than the underlying Chinle. This contact is not always as flat as illustrated here, but variations are minor compared to the average 5,700 m of vertical erosion expected during the 190 Ma gap.

Figure 7. View in northeast Utah, north of the town of Vernal. The Cretaceous Cedar Mountain Formation lies just above the tip of the arrow; below the tip is the multilayered Jurassic Morrison Formation. Between is a 20 Ma gap of mostly Lower Cretaceous time. The light scarp in the hill above the arrow is the Cretaceous Dakota Formation.

of the boundary between the Manakacha and Wescogami Formations can be difficult to determine both from a distance and from close range."[5]

Another geologist, T.H. Van Andel, commenting about a gap in rock layers in Venezuela, states:

> "I was much influenced early in my career by the recognition that two thin coal seams in Venezuela, separated by a foot of gray clay, and deposited in a costal swamp were respectively of Lower Paleocene and upper Eocene age. The outcrops were excellent, but even the closest inspection failed to turn up the precise position of that 15 Myr gap."[6]

Figure 8. The same gap as in Figure 7, only here the missing layers represent around 40 Ma because the Cedar Mountain Formation is also missing. The Cretaceous Dakota Formation lies directly over the Jurassic Morrison Formation. The tip of the arrow is between the two. This is in western New Mexico, 600 km south from the locality of the same gap in Figure 7. This contact between the Dakota and Morrison Formations can be followed for 200 km from west to east in New Mexico. The top of the Morrison Formation had to remain extremely flat for 40 Ma in order to accommodate the thin Dakota Formation, which is spread for many thousands of square kilometers immediately above it. The average erosion expected in 40 Ma is 1,200 m, which indicates that the 40 Ma is invalid.

It does not appear that the proposed millions of years ever occurred.

Gaps are semi-continent wide

As you study the figure legends, you should note that we are not talking about local situations. Many of these flat gaps spread over semi-continent wide regions. Often they lie between layers that are geographically widespread and remarkably thin relative to their lateral extent. The immensity of the layers is completely out of the range of current depositional patterns of sediments on our continents. Their relative thinness and lateral continuity is evidence of the flatness of the area over which they were spread, reflecting the lack of erosion of the underlayer.

For instance, the Cretaceous Dakota Formation that is identified in figures 7 and 8 averages only about 30 m in thickness, but it is spread over some 800,000 km^2 in the western United States. We seem to be dealing with a geologic past that was very different from the present. It is the kind of past that you would expect from the catastrophic activity of the Genesis Flood. One geologist, who does not endorse that Flood, notes:

> "The accumulation of the present stratigraphic record [sedimentary rocks] in many cases involves processes that have not been, or cannot be observed in modern environments … there are the extreme events … with magnitudes so large and devastating that they have not, and probably could not, be observed scientifically."[7]

Some common questions

1. *Could these just represent very flat depositional areas of the earth?* There are very flat depositional areas of the earth such as lake bottoms and the abyssal plains of the oceans, but these are both areas where over time sediments continuously accumulate, and there are no gaps there.

2. *Could these flat areas just be locations where there is no erosion or deposition?* Not unless we can suspend the world weather over hundreds of thousands of square kilometers of the earth's surface for many millions of years. Over the surface of our continents, during the long ages postulated, if you don't have erosion, you should have deposition.

3. *Can erosion be flat?* This idea was postulated a century ago and was called the Davis cycle of erosion, but it has now been largely abandoned due to lack of any current widespread examples of flat erosion on the surface of our continents.

4. *Could these gaps have been protected part of the time by overlying layers?* Yes, but when you remove the overlying layers, erosion would leave an irregular topography unless the underlayer was very hard, and that is hardly ever the case at these gaps.

5. *Is there evidence of weathering over time at these gaps?* Usually not.[8] Where weathering is reported the features can represent transport of material interpreted to be weathered, or changes occurring after the overlayer was deposited (diagenesis). However, over the very long time postulated for the gaps, all should be irregularly eroded away, not just weathered.

6. *Is there any evidence of erosion at these gaps?* Yes, sometimes a little is seen, but it is insignificant compared to what would be expected on average during the long periods proposed for the gaps. Furthermore, during the worldwide Flood, some erosion is expected anyway.

7. *Could erosion rates have been slower in the past?* Possibly a little, but it does not appear that the general weather pattern of the past was dramatically different from the present. Fossil plants and animals that require a rich supply of moisture are generally well represented in the fossil record. However, in the context of our present rates of erosion, you would have to essentially completely eliminate the earth's weather, at least over major regions of the earth, during these long gaps in order to preserve the flatness we find.

8. *If the gaps were under water, would this not protect them from erosion?* No. Much erosion, such as that of our continental shelves, is caused by underwater currents in both shallow and deep water.

Conclusion

Paraconformities, or flat gaps, pose a serious problem for the concept of long geologic ages. On the surface of our restless earth, during the period of the gap with the proposed millions of years of weathering, tectonic activity, and drifting of continents, you have either deposition or erosion of the sedimentary layers. If there is deposition there is no gap because the layers just keep building up. If there is erosion the contact surface (underlayer) should be highly irregular, and not flat. The flatness of the gaps indicates little time has occurred at the gaps.

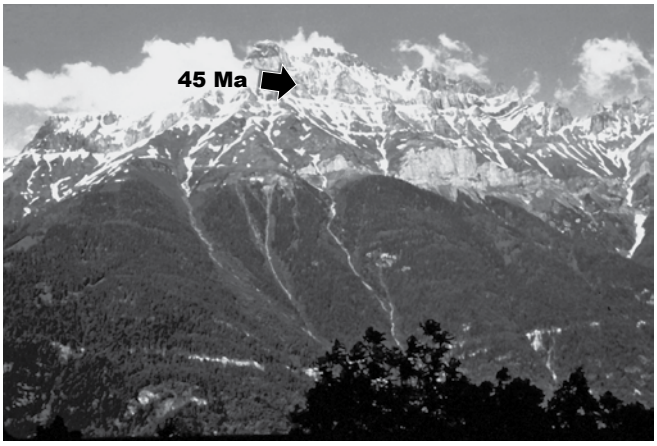

Figure 9. View of the Morcles Nappe in the valley of the Rhone in Switzerland. The 45 Ma gap (probably more) is at the bottom of the slightly darker layer you can follow across the figure from the tip of the arrow. Here much of the Upper Cretaceous and Paleocene are missing. Due to the recumbent folding of the Morcles Nappe, the layers at this locality are in reverse order but the contact is still flat.

Figure 10. View of a gap ("disconformity"[10]) in the layers of the Sydney Basin just north of the town of Clifton, NSW, Australia. Based on estimates from geologic map information, the gap is about 6 Ma[11] and here lies just above the black Bulli Coal seam and a very thin shale cover sometimes found over it. The peculiarity of this gap is that it lies above a widespread 3 m coal seam. This is very unusual because it raises questions about how and when the coal was formed. One would expect 180 m of erosion of the softer coal seam and much more, during 6 Ma. Minor erosion is reported at this contact.

The flat gaps, with their incredibly widespread sedimentary layers just above and below, severely challenge the many millions of years proposed for the standard geologic time scale. The complete absence of the deep erosion expected at these gaps over their alleged long ages is very difficult to explain within the long-age

Figure 11. Palo Duro Canyon in northern Texas exposes a flat gap between the Pliocene Ogallala Formation at the top resting on the Triassic Trujillo Formation. At the tip of the top arrow, the Jurassic, Cretaceous, Paleocene, Eocene, Oligocene, and Miocene are missing. At the tip of the lower arrow, the Lower and Middle Triassic are missing between the Late Triassic Tecovas Formation that lies above and the Permian Quartermaster Formation below. On an average, on the basis of standard geologic time, one would expect some 6,000 m, and 480 m of erosion at these flat gaps.

uniformitarian paradigm. On the other hand, flat gaps are easily explained when interpreted within the worldwide Flood framework described in the Bible, which deposited most of the sedimentary record of the earth. Flat gaps are scientific data that strongly authenticate the truthfulness of the Bible.

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