Antiquity of landforms: objective evidence that dating methods are wrong

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Non-creationists do not believe there is objective evidence for a young earth. However, landforms now provide that evidence. Many landforms, including worldwide erosion surfaces, are dated tens of millions to occasionally over 100 million years old, and yet they are little eroded. Many scientists do not accept their old age because erosion rates are too fast. But, according to C.R. Twidale (1998), the evidence for their old age is overwhelming based on radiometric and fossil dating. However, the existence of these old erosion surfaces is more an indictment of uniformitarian dating methods. Geologists are searching for mechanisms to slow erosion on these landforms, but it does not solve the problem. Erosion surfaces, which are not forming today except on a small scale, provide much better evidence for the Recessive stage of the global Genesis Flood. Quantitative information from erosion surfaces in Montana, U.S.A., and adjacent Canada provides powerful evidence for rapid currents flowing off the land during the Flood.

Many creationists believe in a young Earth from Scripture. They base this confidence in God's word, and that He not only was the only observer of the prehistoric past, but also that He was able to influence men to accurately write His words in Scripture. Non-creationists, on the other hand, claim that our belief in Scripture and a young earth is blind faith. They commonly point to radiometric dating methods as proof that the earth is billions of years old, contrary to a straightforward reading of Scripture. Creationists have written much on dating methods, pointing out their many assumptions and their unreliability.[1] But still, these dating methods come up with millions or billions of years. Is there any objective evidence that the dating methods are highly exaggerated?

Yes, it has been accumulating for many years. One major line of evidence consists of landforms that are dated quite old, while common sense indicates they should have disappeared in a short time within the alleged geological time scale. Therefore, there is something wrong somewhere in dating methods that come up with millions and billions of years.

The surprise of 'ancient landforms'

Geomorphologists, who study the shape of the land surface, up until the last several years, believed that most landforms were no older than Pleistocene or at most late Tertiary within the geological time scale. This is because current weathering and denudation rates are relatively fast, and, consequently, no landform should remain for more than several million years. Some studies have shown that at the present rate of erosion, even taking into account man's influence on the environment, the continents would be reduced to sea level in roughly 10 to 20 million years[2] or possibly up to 33 million years.[3]

However, over the years, geologists have recognised landforms they believe are tens of millions to occasionally **over a hundred million years old.** These old landforms are mostly erosion surfaces and sometimes river valleys.[4–7] An erosion surface is defined as:

> *'A land surface shaped and subdued by the action of erosion, esp. by running water. The term is generally applied to a level or nearly level surface.'*[8]

Note that in this definition, an erosion surface is believed to have been smoothed by running water. This idea is probably based on the veneer of generally rounded rocks that carpet many of them. For example, the Cypress Hills erosion surface in southeast Alberta and southwest Saskatchewan is capped by a thick veneer of well-rounded gravel, cobbles, and boulders of mostly quartzite.[9] Based on various radiometric and fossil dating techniques, geologists have discovered that many erosion surfaces (which were not exhumed from beneath other rocks) and the sides of some river valleys have hardly eroded in many tens of millions of years of alleged time.

For instance, the flat to undulating plateau of western Arnhem Land, Queensland, is dated at over 100 million years old based on late Jurassic and Cretaceous fossils found in sediment within shallow valleys cut on the erosion surface.[10] These fossils put a minimum age on the erosion surface. Based on K-Ar dating of basalt lava that had flowed into the ancestral Shoalhaven River Gorge of southeast Australia, uniformitarian geologists were surprised to find that the walls of the gorge had retreated only 10 m in 30 million years![11] The river is essentially ancient and its width has changed little over many of millions of years, according to

Figure 1. Remnants of a mountain top erosion surface cut in granite of the Beartooth Mountains of south central Montana and northwest Wyoming, U.S.A. The erosion surface lies at an elevation of about 4,000 m above sea level. The slight difference in altitude of the flat-topped peaks is probably due to normal faulting.

the dating technique.

Although many geomorphologists remain unconvinced of the great antiquity of landforms, this 'extremely unlikely' concept has been vindicated, according to Australian geomorphologist C.R. Twidale.[12] Not only are some erosion surfaces in Australia and Africa well older than 100 million years by uniformitarian reckoning, but old erosion surfaces are a worldwide occurrence. Twidale states:

> *'Yet for the past half century or more paleosurfaces have been recognized, and compelling evidence adduced pointing to their great antiquity, not only in Australia and Africa but also, and in lesser measure, in the Americas and Europe.'*[13]

Despite questions on the number and exact age of these erosion surfaces, Twidale accepts the general scheme of geomorphologist Lester King that remnants of erosion surfaces grace the scenery of **all** the continents at generally three levels.[14] These erosion surfaces are often found high in the terrain,[15] and can be amazingly flat. King recognised that about 60 % of Africa is a series of planed erosion surfaces. He developed a hypothesis for their formation called pediplanation in which slopes retreat parallel, leaving behind a series of generally flat surfaces separated by scarps. In referring to one of his three levels, King exclaims: *'A planation of extraordinary smoothness developed over enormous areas in **all** the continents* [emphasis in original]. *'*[16]

Erosion surfaces are very distinctive when the erosional mechanism has truncated tilted sedimentary rocks or granitic rock (Figure 1). The mechanism that sheared dipping sedimentary rocks eroded both soft and hard rocks evenly, sometimes leaving a capping of rounded rocks. The soft rocks remain generally uneroded today, indicating that nature has not had enough time to carve valleys in them. Some erosion surfaces are cut entirely on soft rocks, for instance those erosion surfaces cut on argillite in the central Flinders Ranges.[17] The interesting aspect of these erosion surfaces is that they are large scale and relic, (i.e. survived disintegration and decay by erosion) or at least it is very difficult to relate them to present processes despite numerous attempts over the past century.[18] Except on a local scale, they formed in the past by some unknown mechanism but are observed being dissected today.

'Old-earth' non-explanations

Twidale claims such erosion surfaces are quite old, some much older than 100 millions years, based on radiometric and fossil dating. The task is now *' ...to account for the seemingly impossible...'*.[19] He rejects William Morris Davis's 'cycle of erosion' and other such cyclic schemes and leans towards Crickmay's *'Hypothesis of Unequal Activity'*,[20,21] which Twidale admits only diminishes the problem without solving it.[22] Davis's 'cycle of erosion' was immensely popular during the first half of this century, but it is mostly rejected today, especially because it is mostly hypothetical with no current examples of a 'peneplane' forming today at sea level (base level). The cyclical schemes of Lester King and Walther Penck have fared no better.[23] These cyclical hypotheses were attempts to account for the many erosion surfaces observed over the earth.

Crickmay essentially believes that rivers account for most of the erosion of continents and their erosional activity is unequal. He is correct, but it is not particularly enlightening. Crickmay's hypothesis is supposed to account for the survival of high level erosion surfaces formed by water. However, today these erosion surfaces are observed weathering and eroding. So although the rivers can erode faster (unequal activity), his hypothesis still does not account for old landforms formed by water but barely touched by erosion over tens of millions of years, since even the slower erosion rate on these erosion surfaces should soon destroy them.

Crickmay invented his *'Hypothesis of Unequal Activity'* because he recognised the contradiction between the dates of erosion surfaces and current weathering rates and realised that current hypotheses failed to account for old surfaces. He states the problem this way:

> *'Again, one finds all over the world, even high above and far distant from existing waterways, smooth-surfaced and level ground — including everything from small terraces to broad, flat plains — much of it still bearing intact a carpet of stream alluvium. Such lands were carved and carpeted, evidently, by running water, even though they are now in places where no stream could possibly run*

> *…. What is remarkable about them is the perfection with which they have outlasted the attack of "denudation" for all the time that has passed since they lay at stream level.'*[24]

It really is against common sense that these erosion surfaces can be tens of millions to over a hundred million years old, as admitted by Twidale:

> *'If some facets of the contemporary landscape are indeed as old as is suggested by the field evidence they not only constitute a denial of commonsense and everyday observations but they also carry considerable implications for general theory.'*[25]

Twidale and others continue to fish around for mechanisms to preserve these 'old' surfaces. A resistant rock cap such as a hard sandstone or a duricrust is one possibility. Resistant rocks would indeed slow erosion, but likely not enough to last as long as postulated. The fact that erosion surfaces sometimes truncate tilted hard and soft sedimentary rocks the same indicates that more than structure is involved. Especially contradictory to their 'old' age is that some truncated surfaces still exist that were cut on relatively **soft, easily erodable** rocks.[22,26]

One would expect soft rocks to easily form a drainage network that would soon destroy the flatness. Some geologists appeal to a dry climate as a preserving mechanism, but during geological time, erosion surfaces are expected to have passed through several climatic regimes. Australia supposedly has been slowly drifting northward from the mid and high latitudes during the past 100 million years of geological time. Although much of southern and central Australia has a dry climate today, these areas would have been much wetter during the Tertiary. Besides, erosion is not suspended in a dry climate. Summerfield lists average denudation rates for various climates and relief, based on both the solid and dissolved load of major rivers today.[27] A landscape in a dry climate with low relief denudes at roughly 5–35 mm/1000 years. This is quite fast. Flat or nearly flat erosion surfaces are not expected to last long.

Twidale seems to be desperate for explanations when he appeals to glacial protection in areas once covered by ice sheets.[22] Quaternary geologists now realise that there was little erosion during the Ice Age, except in local areas.[28] Since some erosion surfaces survived the Ice Age, Twidale suggests that a thin veneer of debris helped to preserve these erosion surfaces. The little erosion by ice sheets and the preservation of erosion surfaces in glaciated areas is further straightforward evidence for a rapid, post-Flood Ice Age.[29]

Evidence of receding Flood waters

Erosion surfaces better speak of a mechanism that occurred in the past but is no longer in operation today. It was a worldwide mechanism, since erosion surfaces are seen all over the earth. The mechanism was large scale, able to quickly shear hard and soft rocks evenly, and then erode the whole rock mass further so that erosion surfaces are mostly left as remnants. It was also a watery catastrophe based on the generally rounded rocks capping many erosion surfaces. Furthermore, it was the last major event to shape the surface of the land before erosion from the present climate began slowly dissecting them.

Finally, it occurred not long ago. The mostly likely candidate is the Recessive stage of the global Genesis Flood as the waters drained off the land.[30]

To examine whether a diluvial mechanism for the formation of erosion surfaces is viable, Peter Klevbeg and I quantitatively examined the two highest surfaces in the region where we live.[31,9] The highest erosion surface is represented by the Cypress Hills of southeast Alberta and southwest Saskatchewan, Canada. This erosion surface is a remarkably flat plateau about 130 km east-west and averaging 30 km north-south. The western end lies at an altitude of 1466 m above sea level (ASL), 300 m above the next highest erosion surface. The erosion surface slopes eastward at about 2.7 m per km to an elevation of 1070 m ASL at the eastern end, which is about 100 m above the erosion surface below. The

Photo by Michael Oard

Figure 2. *10-cm diameter percussion marks in a well-rounded quartzite boulder from the west block of the Cypress Hills, Alberta, Canada.*

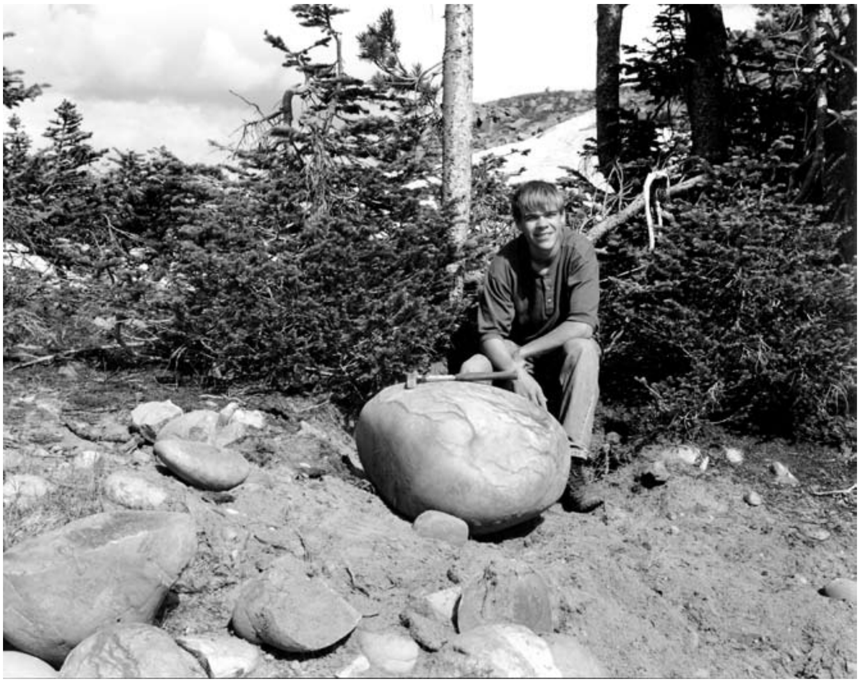

Figure 3. *Well-rounded 200-kg quartzite clast found on a mountain ridge in the Wallowa Mountains at an elevation of about 2,500 m above sea level. The rocks in the foreground with sharp edges were probably fractured by frost shattering.*

western end of the erosion surface lies about 600 m above the rivers to the north and south. The erosion surface has been dissected probably by glaciofluvial activity. The most striking feature of the Cypress Hills erosion surface is that it is capped with about 25 m of mostly massive gravel, cobbles and boulders, predominantly of well rounded quartzite in the western and central portion. The eastern portion has many sand interbeds containing abundant mammal fossils. The largest clast we found had an a-axis of 39 cm, a b-axis of 24 cm, and a mass of 26 kg.

The second highest erosion surface is considered the Flaxville surface, which is mainly composed of large plateaus in north central and northeast Montana. This surface is similar to the Cypress Hills surface and the rocks are virtually identical. (It is interesting that the mammal fossils associated with both erosion surfaces date the rocks at 1 million to 45 million years and yet the rocks are identical and little weathered.) Based on inferred paleocurrent directions in the Cypress Hills, the nearest source for the quartzite is the Rocky Mountains of northwest Montana. Thus, the quartzite has been transported over a **very low slope** for a distance of at least 300 km to the western Cypress Hills and 700 km to the eastern-most Flaxville plateau. Some researchers now believe that the coarse gravel may have originated from central Idaho.[32] So, if this is the case, one has to add another 200 km to the above distances.

Intuitively, modern rivers cannot transport abundant cobbles and boulders anywhere near **700 to 900 km** on such low slopes. To quantitatively estimate this, Peter employed standard coarse-sediment paleohydrologic equations and calculated that to transport the clasts as bedload, minimum current velocities of 4–6 m/sec with minimum water depths of 3 to 40 m are required. This is close to the fastest flash floods that rush down steep slopes. Unless very narrow channels are postulated, for which there is contrary evidence (geomorphology of the deposits indicate a wide, sheet flow), resulting discharges would have been orders of magnitude greater than historic regional floods.

Another distinctive feature of the quartzite clasts is the abundant percussion marks, circular or semicircular cracks, on the hard quartzite, a few 10 cm in diameter (Figure 2). This implies that much of the pebble and cobble size fractions were transported in suspension at times. There is a relationship between the horizontal velocity to keep the clast in suspension and the fall velocity of the clast, which takes into account the mass, shape and spin of the clast.[33] Two calculations were performed. A modest-sized spherical clast 10 cm in diameter produced a minimum current velocity of 15 m/sec.

A second calculation was applied to the largest non-spherical clast that could briefly be in suspension. For a bladed clast 15 cm wide, Peter calculated a minimum current velocity of **30 m/sec** with a minimum flow depth of **55 m**.[34] This velocity is close to the modern speed limits on the area highways. These numbers defy uniformitarian mechanisms and are much more consistent with a diluvial mechanism.

It is interesting that similar quartzite rocks with percussion marks are found over a wide area in the northwest United States and adjacent Canada, including the tops of mountains and in valleys on both sides of the Rocky Mountains. I have found them at many places of northern Oregon and southern Washington. For instance, large quartzite boulders cap several of the mountain ridges in the Wallowa Mountains of northeast Oregon. One well-rounded quartzite clast weighing about 200 kg (Figure 3) was found on a ridge 2500 m ASL. Quartzite does not outcrop in the Wallowa Mountains; the nearest source is 100 km to the east in central Idaho.

Conclusion

The survival of these erosion surfaces all over the earth is objective evidence that the dating methods responsible for the old 'ages' are highly exaggerated. This justifies the search for other interpretations for dating methods by creationists, as exemplified by the massive research effort by the group called RATE (Radioisotopes and the Age of The Earth), a joint effort by the *Institute for Creation Research*, the *Creation Research Society,* and *Answers in Genesis*.[35]

Post Script — why don't creationists publish in mainstream journals?

I wrote a challenge to Twidale's paper and sent it as a discussion item to the editor of the A*ustralian Journal of Earth Sciences*. I was up front that I was a creationist and that I considered Twidale's paper primarily a challenge to conventional dating methods. I was kindly told that my discussion of Twidale's paper was not appropriate for publication in the *Australian Journal of Earth Sciences* (the technical journal), but might be considered for *The Australian Geologist* (the news magazine), since that magazine had published a few comments by creationists. Since Twidale's article was not published in the latter magazine, I did not believe it was appropriate to send my discussion there. I and other creationists have been challenged that if our work were scientific enough, we should submit it to peer review in the mainstream journals. Those who say this should really know better. It is not necessarily the quality of the article, but the fact that it was written from a creationist perspective that elicits an automatic rejection.[36]

Acknowledgements

I thank Tas Walker from *Answers in Genesis* for calling attention to and sending me a copy of Twidale's article. I appreciate Peter Klevberg for reviewing the manuscript.

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