The mountains rose

A review of
The Origin of Mountains
Edited by Cliff Ollier and Colin Pain
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This is a book with a controversial message on the origin of mountains—controversial that is to uniformitarian geologists. Cliff Ollier and Colin Pain are well known geomorphologists from Australia who apply geomorphology, the study of the origin and development of the Earth's surface features, to Earth science problems. Their decades of international experience give them insights into the origin of mountains that are valuable to creationists attempting to model the details of the Genesis Flood.

Strata first folded

Many geologists and geophysicists assume that the mountain building process of horizontal compression caused the folds we see in the mountains today. But the authors state:

> 'There is no direct evidence that folding was accompanied by mountain building' (pp. 274–275). The main reason for this radical deduction is 'the certain knowledge that the strength of rocks is insufficient to permit folds to be created by lateral compression' (p. 275).

The authors believe that most folds, as well as thrusts, were caused when huge masses of rock slid down slope under the influence of gravity, an idea denied by most geologists today. To back up their contention, they provide some impressive modern analogues from the continental slope and rise, including the huge Agulhas Slump off southeast Africa, the distal Bengal Fan, and the Niger Delta. Tensional and compressional structures, similar to those found in mountains, have formed in these areas during downslope mass movement. Seismic sections of ancient folded sediments from all over the world, especially along convergent plate margins, look similar to these modern marine sediments found along the continental margins.

It is my opinion that another mechanism for folding also is valid, and that is differential vertical tectonics, as propounded by S. Warren Carey.[1] For example, there are quite a number of anticlines in Montana and other areas of the Rocky Mountains of North America that are cored by granitic rocks.[2] The sedimentary rocks form drapes over these plutonic cores. Although it is generally believed such basement-cored anticlines were produced by horizontal compression, it is easier to believe they were produced by upward vertical tectonics, especially since mid and upper crustal rocks are likely to fail upon compression and not produce folds.

Strata next planed worldwide in about the Miocene of the geological time scale

Ollier and Pain show that after the strata were folded by these tectonic events, they were planed down to form flat surfaces, called planation surfaces, on all the continents, including Antarctica (p. 214). This global planation process cut across previously folded sedimentary rocks and smoothed both the hard and soft rocks evenly. Even massive granite was planed over many areas, as in the Tien Shan Mountains of central Asia (p. 144). Planation is assumed to have occurred subaerially by the kinds of erosional processes that we observe today on the continents. The surfaces were planed down to what is called base level, which is usually considered to have been sea level (p. 3). It is interesting that one planed area, the area that is now occupied by the Apennines Mountains of Italy, was planed *below* sea level (p. 72)!

In some areas the planation surfaces are very flat, such as the plains of Australia and Africa (p. 1). Below these plains the sedimentary rocks are generally folded. Ollier and Pain marvel how such planation could have occurred at all and that is was so widespread:

> 'The remarkable thing is that plains of great perfection are ever made, despite all the obvious possibilities of complications. But they are real, and planation surfaces were widespread before the uplift of the many mountains of Plio-Pleistocene age' (p. 302).

They are surprised, of course, because the observed surfaces are inconsistent with their uniformitarian worldview. Erosional processes today do not produce the flat landscapes that were produced in the past. Present processes roughen surfaces, forming rills, coulees and valleys. Today, we observe that previously-planed surfaces are dissected. Planed surfaces do not develop today, except on a very local scale when perhaps a river suddenly shifts its course and moves across tilted sedimentary rock.

Furthermore, the field relationships show that planation in the past mostly occurred in the Late Miocene-Early Pliocene period (p. 302), suggesting that it occurred *rapidly*:

> 'There is nothing very special about the climate in the Late Miocene-Early Pliocene period when there often occurred planation that suggests an increased erosion rate, and in any case the mountains discussed are in a wide range of latitudinal and climatic situations. At present, the cause of the observed high rate of planation remains a mystery.'

Of course, their concept of climate in the Late Miocene-Early Pliocene is based on uniformitarian assumptions, which ignores the effects of the Genesis Flood.

A further mystery is that, within the uniformitarian time scale, some planation surfaces are very old, such as the planation surface of the Kimberly Plateau of north central Australia that was planed in the Proterozoic and has apparently not been covered by protecting sediments since then (p. 27). It defies imagination how such a surface could have remained so flat for 600 million years or more, when present processes could dissect a continent and erode it to near sea level in 10 to 33 million years. The presence of such 'old' planation surfaces is objective evidence that the dating methods, both fossil and radiomentic, used to date the time of planation are wrong.[3]

Mountains uplifted globally in Plio-Pleistocene

Ollier and Pain show that after all the continents were planed, they were uplifted and dissected. The authors essentially conclude that the plains that were once near sea level in the Miocene were uplifted to form the mountains we see today. They believe this is the origin of nearly all mountains and have an impressive amount of evidence to back up their conclusion.

In the mountains today we observe all stages of this past dissection. Some planation surfaces were dissected completely during uplift, leaving behind rough mountains with no sign of a planation surface. In other mountains, the planation surface is left on the top as an erosional remnant. Sometimes these planation surfaces are at different altitudes in the mountains due to differential uplift. The evidence for these planation surface remnants is readily observable, even to the untrained eye (pp. 128–130). The highest mountains in Montana, the Beartooth Mountains, are an excellent example of this. They display impressive flat topped granitic peaks at a height of about 4,000 m.[4]

The most controversial aspect of the authors' geomorphological deductions is their contention that practically all the uplift occurred in the Pliocene and Pleistocene, the last two epochs of geological time! The huge Andes Mountains (p. 127) are but one example. Another is the Tibetan Plateau, which is considered to be one vast erosion surface that uplifted in the Pliocene-Pleistocene (pp. 128–129, 137–138). Furthermore they present an impressive table of mountains from all over the world that uplifted during this time frame (pp. 304–306).

As the mountains uplifted, the authors point out that some of them spread laterally, thrusting rocks over the surrounding lowlands (p. 12). Another name for this spreading is 'mushroom tectonics'. This would account for all the thrust faults, if indeed they are real, that we often find at the edge of uplifts. It is also likely that granite mountains were uplifted when the granite was already solid (pp. 184–185).

Do the authors, or anybody else, know the cause of such recent vertical tectonics? Does the lack of a mechanism nullify the authors' field deductions? The answer is no. They provide a list of 20 possible mechanisms for vertical tectonics, none of which can be demonstrated to be occurring today (p. 308). One strong contender is isostasy after erosion, but the authors find much evidence against this suggested mechanism:

> 'But most other mountains and plateaus tend to have very distinct edges, suggesting uplift of distinct blocks, and to raise such blocks by isostasy alone seems improbable' (p. 286).

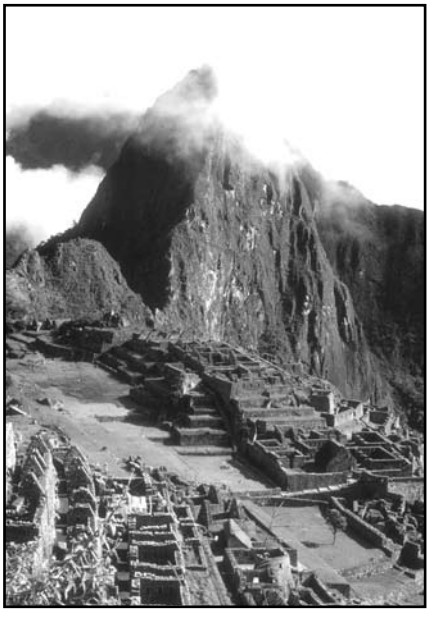
Plate tectonics explains very few mountains

One of their conclusions is quite controversial, namely that plate tectonics explains very few mountains. Plate tectonics has a difficult time explaining mountains on passive plate margins and even on some spreading sites without the need to incorporate secondary, *ad hoc*, assumptions into its paradigm (p. 14). Even mountains within plates, such as the Ruwenzori Mountains of Africa (p. 53) and the Ouachita Mountains in the central United States (p. 109), are difficult to explain. They summarize:

> 'A great many mountains, plateaus and other landscape features have no apparent relationship to plate tectonics situations' (p. 297).

They are skeptical of the plate tectonic idea for the formation of isostatically balanced mountains by what is called crustal thickening:

> 'We do not equate either mountain building or orogeny with crustal thickening, and suspect that few



The Andes mountains in Peru. The authors contend that the huge Andes Mountains uplifted in the Pliocene-Pleistocene.

other workers do so' (p. 6).

Ollier and Pain also assert that plate tectonics has ignored planation and its implications, especially the timing right before the Pliocene. A good example of this is the Alps (p. 63) and the Central Cordillera of Spain (p. 85). The authors attribute the formation of rifts, such as the East African rift (p. 49), to fairly recent vertical tectonics. They even state that the East African rift can be traced to the Carlsberg Mid Ocean Ridge in the Indian Ocean:

> 'As noted in a previous section, the formation of swells seems to initiate faulting, rifting and extension, and it is interesting that the rift valley system of Africa can be traced continuously to the Red Sea, and thence to the Carlsberg sub-oceanic ridge' (p. 52).

By this they are implying that vertical tectonics also produced the mid-ocean ridges in the last periods of geological time.

Although the authors provide a list of 17 significant problems with plate tectonics (pp. 298–300), they maintain that they still believe in the paradigm:

> 'There is overwhelming evidence that the Atlantic Ocean has been formed by the drifting apart of the continents that bound it … We should make it clear that we have no objection to plate tectonics in general, for it explains many things. But we do object to the simplistic explanation of mountains and their distribution' (pp. 13, 272).

They simply suggest that there are additional processes acting besides plate tectonics (p. 300). It is possible that the concept of catastrophic plate tectonics occurring during the Genesis Flood can explain some of the problems the authors have raised with uniformitarian plate tectonics.

Philosophy lessons in science

As a result of the authors' long experience, involving somewhat controversial ideas, they have learned a number of important lessons in the philosophy of science to which we creationists can certainly relate.

They mention how they have observed that ruling paradigms do not tolerate other explanations, even if the originators of these explanations still believe in the paradigm. Ruling paradigms tend to censor anyone who dares to disagree, even a little:

> 'Another problem arises from orthodoxy. Anyone who disagrees with the ruling theory is regarded as an ignorant fool by the majority, and authoritarian orthodoxy even goes so far as the suppression of publications that do not fit the orthodox scenario (nowadays plate tectonics) …' (p. 314) [parentheses theirs].

First, the authors have had their own work rejected by referees because it was not couched within the language of the paradigm (p. 301). Such pressure to conform also causes researchers to blindly fall in line, like solders on the march.

Second, they complain that most data from geomorphology, as well as some from geology and geophysics, is *omitted or suppressed* 'in favour of the grandiose tectonic picture' (p. 123): 'The latest obstacle to the flow of reason is an increasing disregard for ground truth, or what used to be called field evidence' (p. 315). They predict that in the study of mountains geomorphology will continue to be ignored (p. 310). This is part of the ruling paradigm error, they say: 'One of the greatest, and commonest, errors in the history of science is the fallacy of single cause' (pp. 313–314).

Third, in their opinion Earth science has become too concerned with theory, models, and dogma (p. xvii): 'Indeed, the dead weight of orthodoxy and the preference for models over ground truth that prevails today suggest that we have less reason for optimism, not more' (p. 312).

Fourth, most scientists jump too quickly for an ultimate mechanism with too little data. The authors suggest that a better methodology would be patience to wait for the mechanism to unfold: 'If we first get the geometry right, then in time, we might work out the kinematics, and if we know that we might, just possibly, venture on the driving force' (p. 314). To me, this seems a sensible way of finding ultimate causes for the rocks and fossils.

Authors' field deductions fit well into the Recessive Stage of the Flood

The authors radical field deductions of folding of strata, of worldwide planation before the mid Pliocene, then uplift and dissection of the planation surfaces, fits in neatly within the Flood model, especially the Recessive Stage of the Flood.[5–7] The folding of strata can occur mostly during the Inundatory Stage due to rapid sedimentation and tectonics in which huge masses of consolidated to partly consolidated strata slide downslope. It is interesting that the authors find analogs for folded strata from mass movement along the continental margin. In other words, the folds we now see in ancient rocks on the continents likely happened *underwater*.

And, as a bonus for creationists, the authors suggest an origin for the vast amount of carbonate rocks found in the strata:

> 'Many lavas are very rich in alkalis, sodium and potassium, and some are rich in carbonate including the remarkable Oldoinyo Lengai in Kenya. Carbonatite is a volcanic rock consisting largely of igneous calcite and suggests vast accumulation of carbonate at the base of the crust' (p. 180).

I know that some creationists have proposed that carbonates were erupted during the 'fountains of the great deep' or other tectonic activity. A vast accumulation of carbonates at the base of the crust would not only be radical from a uniformitarian standpoint, but also provide a source for the large volume of carbonates in the sedimentary record.

When the water peaked around Day 150, powerful water currents would likely have planed the continental strata, which would have been in

Event/Era	Stage	Duration	Phase
New-World		4000 years	Modern
		300 years	Residual
Flood	Recessive	100 days	Dispersive
		200 days	Abative
	Inundatory	30 days	Zenithic
		20 days	Ascending
		10 days	Eruptive
Lost-World		1700 years	Lost-World
Creation	Formative	2 days	Biotic
		2 days	Derivative
	Foundational	2 days	Ensuing
		0 days	Original

The Biblical geological model as proposed by Tas Walker. Mountain building may have occured during the Recessive Stage of the Flood.

relatively shallow water due to recent deposition. These powerful currents would have been caused by a number of mechanisms, including the spin of the Earth acting on huge continents, more than 2,500 km in extent, submerged less than 1,000 m below the sea surface.[8] The beginning of uplift during the Abative Phase would also add a component of flow from the center of rising sediments. With time, that flow would predominate and produce more planation.

The authors state that the planation was marine in the Apennines of Italy (p. 72), which is strongly contrary to the prevailing wisdom of subaerial erosion. They also state that most strata, when deposited on a planation surface or in a valley cut on that surface, are *marine*. These observations were once interpreted as marine planation by a transgressing shoreline, an idea popular in the 19th century (p. 234). The planation is also supposed to have been rapid, within the uniformitarian system of course. This data hints strongly that maybe all planations occurred rapidly underwater, readily fitting in with the Genesis Flood.

Ollier and Pain hint at the radical possibility that granitic rocks were solid when planed and uplifted. This is a deduction that I am entertaining. An indication that uplifted granite masses were solid, and probably never molten, is the existence of planation surface remnants at the tops of many granitic mountains.[4,9] In order to be planed *during* the Flood before the great uplift of the Recessive Stage of the Flood, it is reasonable that these huge granitic masses would have been solid, or at least rigid, before planation.

The origin of mountains by great uplift and dissection of the planed strata and granitic bodies is strong support for the Recessive Stage of the Flood. Dissection of the planed surfaces would be explained by a combination of strong currents becoming more channelized and flow becoming predominantly downslope towards the sinking ocean basins as the uplift progressed.[10] It is especially significant that this great mountain uplift from below or near sea level is in the last periods of geological time, dated automatically into the Pliocene and Pleistocene of the uniformitarian time scale. In other words, this great worldwide uplift is the *last* great geological, tectonic event to have occurred on the Earth (not counting the Ice Age), and it occurred *rapidly*. The authors admit that such deductions, the results of dozens of years of field observations, are not in accord with the principle of uniformitarianism, which requires geological processes to have occurred continuously through geologic time. The dogma of uniformitarianism, or modifications of it, have dominated geological theory for over 200 years:

> 'Uplift occurred over a relatively short and distinct time. Some Earth process switched on and created mountains after a period with little or no significant uplift [to produce the planation]. This is a deviation from uniformitarianism ... . We are seeing the results of a distinct and remarkably young mountain building period. This is a deviation from strict uniformitarianism' (pp. 303, 306).

What powerful support for the Flood, especially the Recessive Stage, these authors have unwittingly provided with their understanding of the origins of mountains.

References

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