Part XII

Planation Surfaces and Inselbergs Carved by the Flood

We have described planation surfaces that are common on every continent. The uniformitarian scientist does not have a good explanation for these surfaces, but if we were to apply their principle of the present is the key to the past, we would discover we need huge horizontal sheets of water, moving rapidly, to form planation surfaces. This is because planation surfaces are observed forming today along the edges of rivers when a flood planes the edges down. Extrapolating this present process to the size of planation surfaces shows how we need the Genesis Flood to plane the rough land down to a flat or nearly flat surface. During the planning, it is not unusual to leave behind erosional remnants or inselbergs, and so we would expect some tall inselbergs, including tower karst, left behind on planation surfaces today that attest to rapid Flood runoff.

Chapter 57

Early Retreating Stage Erosion and Planing

As we have seen in Parts X and XI, the uniformitarian paradigm lacks a viable explanation for planation surfaces or for the inselbergs that rise above them. William Morris Davis' hypothesis was once a popular explanation for rolling erosion surfaces. But his hypothesis has been rejected because it cannot explain flat planation surfaces. His cycle of erosion was not supported by field evidence.

To address that shortcoming, contemporary geomorphologists proposed many alternatives (see Chapters 50 to 52 and Appendix 19). As we have seen, each one fails to explain what is actually observed in the field. The weathering hypothesis seems to be the most popular today, likely only because it fills an uniformitarian theoretical void, but like the others, it is severely deficient. No uniformitarian hypothesis can account for large planation surfaces. Some uniformitarian scientists have called for a new, outrageous hypothesis (see Chapter 2).

Planation Surfaces Formed by a Large-Scale Flow of Water

Crickmay noted that glaciers, wind, etc. do not produce planation surfaces.[1] It is *only water* that has that potential, and yet it is only observed in modern settings to bevel strata in very localized settings during river floods.[2] Since planation surfaces are so common on all the continents, Crickmay made the point that the origin of planation surfaces must be sought on a *global scale*:

> All this evidence tends to indicate unity and simple design among these flat surfaces, and to encourage the hope that the business of seeking their origin is not many little problems, but *one major problem* (emphasis mine).[3]

What Crickmay and his peers have failed to notice is that there *is* a global watery mechanism available. It has not been applied because it is at odds with the ruling uniformitarian paradigm. It is like the proverbial elephant in the room—the obvious choice that mainstream scientists avoid because their worldview will not allow them to admit its presence.[4] This explanation is the scouring action of the Recessional Stage of the Flood (see Chapter 3). If Crickmay could have extrapolated his observations of river floods which cause very small planation surfaces along the edge to the large scale, he might have realized the need for the global watery catastrophe of the Genesis Flood.

Sheet Flow Planes the Land

Planation and erosion surfaces can be explained by the Floodwater retreating off the emerging continents and eroding them. Since many planation surfaces cover areas over 1,000 mi^2 (2,500 km^2), the planing is best explained by the Sheet Flow Phase of Walker's biblical

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[1] Crickmay, C.H., 1974. *The Work of the River: A Critical Study of the Central Aspects of Geomorphology*, American Elsevier Publishing Co., New York, NY, pp. 216-217.
[2] Crickmay, Ref. 1, p. 205, 214.
[3] Crickmay, Ref. 1, p. 210.
[4] Behe, M.J., 1996. *Darwin's Black Box: the Biochemical Challenge to Evolution*. The Free Press, New York, NY, pp. 192-193.

geological model,[5] as developed in Chapter 3. Additional planing undoubtedly took place during the Channelized Flow Phase, as seen in some valleys (see Figure 17.11), but the majority of the planing was probably earlier.

Early in the Retreating Stage, water currents would have transitioned from generally continental-scale, west to east flowing currents at mid latitudes (likely due to the Coriolis effect or the spin of the earth[6]) to currents that flowed off of and away from rising continents and mountain ranges and towards the oceans. These currents would have at times been moving at high velocities. Rocks and debris carried along by these waters would have planed the land surface like sandpaper smoothing rough wood. Faster currents would have eroded wide areas of land to flat surfaces, shaving both hard and soft rocks evenly, due to the extremely high energy of flow. As the currents slowed, a more rolling erosional surface would have been created.

Cobbles and boulders would have been transported by fast turbulent flow. Under those conditions, individual rocks would repeatedly crash into other rocks, forming percussion marks on hard rocks and shattering soft rocks. Based on the rock sizes found on top of the Cypress Hills planation surface, Klevberg estimated current velocities in excess of 65 mph (105 kph) as described in Appendix 9.[7]

High Plains Planation Northern Montana and Adjacent Canada

In regard to the case studies presented in Chapter 36 and 37, the Flood must have eroded the High Plains in phases with a series of planation surfaces that were subsequently re-eroded, ending up with planation surface erosional remnants at generally four levels (see Figures 36.1 and 37.8). Planing and erosion would have happened during the fast flow. As the flow lessened, from either normal variation in current velocity or possibly pulsed uplift of the Rockies to the west, quartzite gravel would be deposited on the planation surface. Then the velocity must have picked up again and eroded the previously formed surface, leaving behind erosional remnants from it. So, the highest Cypress Hills planation surface was of much greater extent when it first developed, probably extending from central Montana into at least central Alberta. Further continental uplift and subsiding ocean basins provided an increasing elevation difference driving current velocities sufficient to erode this planation surface to the extent demonstrated by erosional remnants that include the Cypress Hills.

The next planation surface down from the Cypress Hills was the Wood Mountain Plateau, followed by the Flaxville surface, only a little lower. As the land continued to rise, possibly episodically, Flood currents would continue to form lower planation surfaces and erode those already formed but leaving behind erosional remnants. A veneer of cobbles and boulders cap all these planation surfaces, probably signifying the waning stages of the sheet flow that was becoming more channelized with time. Thus, estimates of current velocities based on these rocks probably represent the lower water speeds achieved. The final stage of channelized flow then carved the valleys we see today. After the Flood, rivers and streams occupied many of these

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[5] Walker, T., 1994. A Biblical geological model. In, Walsh, R.E. (editor), *Proceedings of the Third International Conference on Creationism*, technical symposium sessions, Creation Science Fellowship, Pittsburgh, Pennsylvania, pp. 581-592.

[6] Barnette, D.W. and J.R. Baumgardner, 1994. Patterns of ocean circulation over the continents during Noah's Flood. In, Walsh, R.E. (editor), *Proceedings of The Third International Conference on Creationism*, Technical Symposium Sessions, Creation Science Fellowship, Pittsburgh, PA, pp. 77-86.

[7] Klevberg, P. and M.J. Oard, 1998. Paleohydrology of the Cypress Hills Formation and Flaxville gravel. In, Walsh, R.E. (editor), *Proceedings of the Fourth International Conference on Creationism*, technical symposium sessions, Creation Science Fellowship, Pittsburgh, Pennsylvania, pp. 361-378.

valleys, some of them flowing through water gaps, also inexplicable to uniformitarians. Based on the height of the Cypress Hills, total erosion of the high plains was greater than 2,500 feet (760 m).

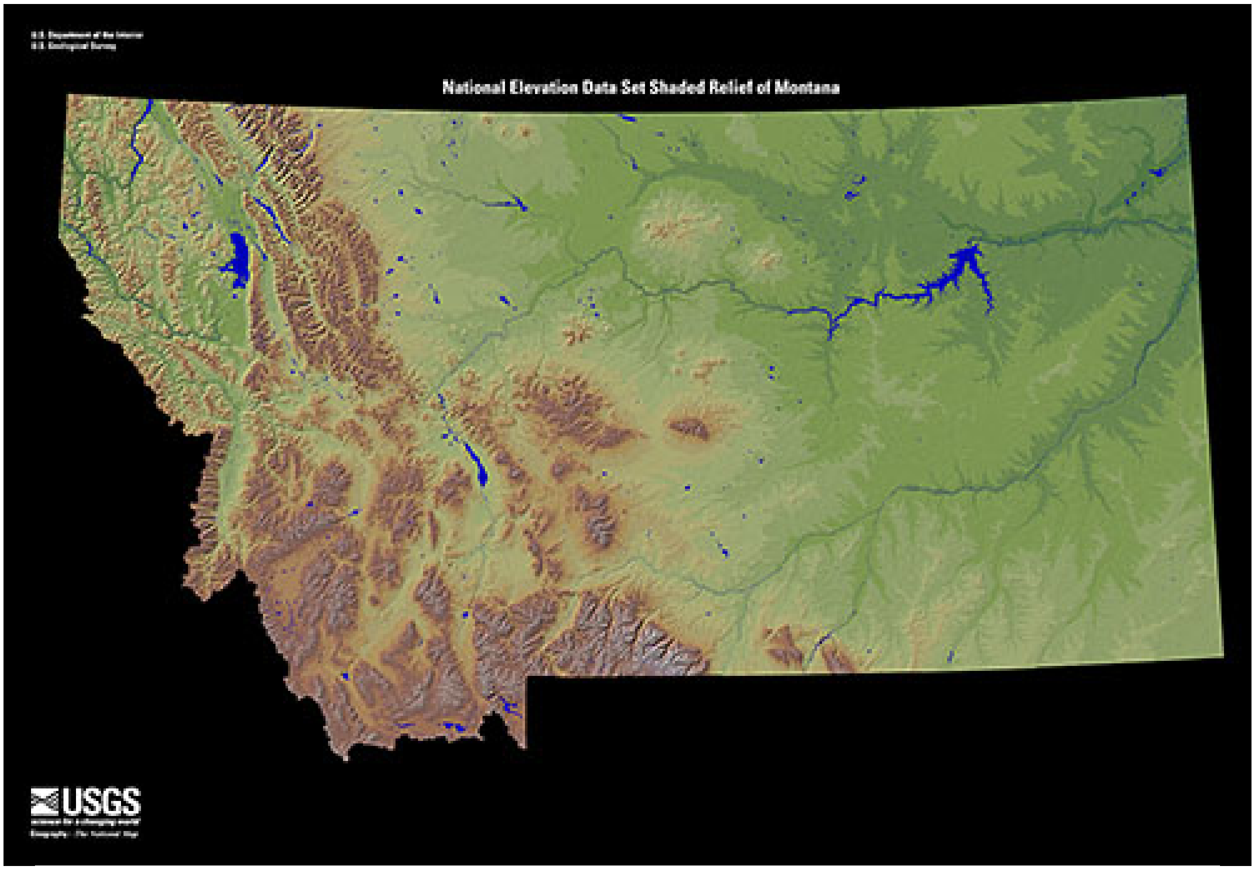

Figure 57.1. Map of Montana showing mountain ranges with brown and white areas being mountains and green areas low areas and plains (USGS and Wikipedia).

The Fairfield Bench represents the southern extent of the large-scale scouring of the High Plains of northern Montana (Figure 57.1) and southern Alberta in which there were few mountain ranges to restrict eastward water flow. The Fairfield Bench is about 80 miles (130 km) long with the eastern end just northeast of Great Falls, Montana (see Figure 37.6). This is Alden's Bench Number 2,[8] or the third planation surface from the highest, as developed in Chapter 37. Figure 57.2 is a picture of the western Fairfield Bench looking out toward the erosional remnant of Square Butte capped by a sill of the Adel Mountain Volcanics. The Fairfield Bench is the planation surface that especially inspired William Morris Davis with his idea of the "cycle of erosion" (see Chapter 50). The sedimentary rocks that were planed dip about 1-3° to the west over the western portion of the bench. The planation surface on top dips to the east at an angle of less than 1°. So, the sedimentary layers that consist of both hard and soft layers have been *evenly sheared at a low angle*. This would have required a very powerful current at least as wide as the Fairfield bench.

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[8] Alden, W.C. 1932. Physiography and glacial geology of eastern Montana and adjacent areas. *U. S. Geological Survey Professional Paper 174*, Washington, D.C.

Figure 57.2. The western Fairfield Bench (Alden's Bench number 2), a flat planation surface (from about 40 miles west of Great Falls, Montana). Square Butte, a lava sill capping plains sedimentary rock, in the background.

Klevberg calculated minimum currents speeds of 30 mph (50 kph) on a small, lower planation surface along the southern margin of the Fairfield bench that corresponds to Alden's Bench Number 3 (see Appendix 9 and Figure 37.7).[9] The Fairfield bench is variably capped by cobbles and boulders, especially quartzite, but the texture of the quartzite is of lower grade than those on the Cypress Hills, Wood Mountain, and Flaxville Plateaus. We can identify the source of this low-grade quartzite and other rock types from the mountains just east of the continental divide.

Erosion Surfaces Formed Central Montana

The northern portion of Montana, east of the divide, and adjacent parts of Canada have very few mountain ranges (the small, widely separated Bears Paw Mountains, Sweetgrass Hills, and Little Rocky Mountains) that might have slowed sheet currents flowing eastward off the Rocky Mountains (Figure 57.1). I would expect very fast sheet flow on the northern High Plains of Montana and the High Plains of Alberta and Saskatchewan, Canada. That is probably why rounded quartzite rocks are spread up to 800 miles east to northeast in this area (see Chapter 14).

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[9] Klevberg, P., 1998. The Big Sky Paving gravel deposit, Cascade County, Montana. *Creation Research Society Quarterly* 34:225-235.

Figure 57.3. Terrain south of the Fairfield bench (from about 40 miles west of Great Falls, Montana). Crown Butte in the background center of picture.

Just south of the Fairfield bench, the terrain is composed of a series of slightly westward-dipping bedding planes, similar to the dip below the Fairfield bench, separated by east-facing cliffs (Figure 57.3). It is as if the Flood's currents failed to shear this terrain flat. Why the difference between the two areas separated by the Sun River? I suggest that the currents south of the river were *too slow*, because of major mountainous obstructions. In central Montana, there are six mountain ranges that surround the Judith Basin, east of Great Falls. As these ranges uplifted in the Flood, they would act to obstruct flow and slow the currents. Thus, just south of the Fairfield Bench, east of the Rocky Mountains in central Montana, rolling erosion surfaces formed while flat planation surfaces formed in northern Montana. Pediments formed along the mountain ranges of central Montana. From this, I conclude that flat planation surfaces are formed by *high-velocity flow*, while erosion surfaces are formed by moderate-velocity flow.

In southern Montana, several high mountain ranges uplifted late in the Flood near the border, leaving a wide valley to the north (Figure 57.1). The valley now forms the lower reaches of the Yellowstone River. A wide Flood current would be flowing east in this valley, and numerous pediments are found along the edges of the (Figures 57.4 and 57.5).[10]

[10] Oard, M.J., 2004. Pediments formed by the Flood: evidence for the Flood/post-Flood boundary in the Late Cenozoic. *Journal of Creation* 18(2):15-27.

Figure 57.4 Gravel-capped pediment along the Yellowstone River at the Livingston airport.

Figure 57.5. Tilted strata truncated below the pediment in Figure 57.4.

Planation and Erosion Surfaces Sheared Worldwide

Flood drainage would be variable across the earth, and so the formation of planation surfaces would vary based on different current velocities, mountains obstructing the path, on-going tectonics, rock types, etc. The examples above on the High Plains of Montana, where uplifting mountains obstructed currents and reduced their velocity, while resulting in increased flow in broad valleys and the northern plains, produced the pattern now observed. A similar pattern can explain the various planation surfaces, or lack thereof, farther south along the High Plains, such as the Sherman Erosion Surface in southeast Wyoming and northwest Nebraska (see Figures 38.4 and 38.4). There are few planation surfaces west of the continental divide because of all the mountain ranges. There is one planation surface likely on top of the Idaho Batholith in west-central Idaho that is deeply dissected.[11,12,13] (The dissection of planation surfaces will be taken up in Volume III when I discuss the Channelized Flow Phase of the Flood.) Evidence for uplifting mountain ranges during the Retreating Stage of the Flood in the northwest United States is demonstrated by quartzite gravel found on top of four mountain ranges both west and east of the continental divide: (1) the Gravelly Range of southwest Montana, (2) the northern Teton Range of northwest Wyoming, (3) the Wallowa Mountains of northeast Oregon, and (4) the Blue Mountains of central Oregon.[14,15,16] This quartzite rapidly spread east and west from mainly the western Rocky Mountains late in the Flood. In order for the quartzite to now be on the top of mountains, the mountains had to carry the gravel upward during uplift.

Variations in current velocities are likely responsible for the differences between planatin and erosion surfaces. For example, the uplift of the Appalachian Mountains would have diverted and deflected flow east, south, and west. Sheet flow erosion is evident in the dissected Allegheny Plateau, Cumberland Plateau, and other plateaus west of the Appalachian Mountains. The long-distance transport of gravel reinforces this view (see Chapter 27).

Planation surfaces on Africa appear to have been formed across the whole continent, creating huge planation surfaces or possibly one large continent-wide planation surface (see Chapter 42). Then uplifting domes, especially near present-day coasts, caused Great Escarpments to form by perpendicular flow off the continents (see Figure 12.3).

Planation Surfaces Deformed and Eroded

After a planation or erosion surface formed in a given area, subsequent Flood activity would modify those surfaces. Further erosion would shrink the size of the planation surface, so practically all planation surfaces are remnants of once-greater surfaces. Volcanism would have covered parts of some surfaces with rock and ash, obscuring them. There appears to have been significant volcanism in the western United States during the Retreating Stage of the Flood. This is observed in volcanic terranes such as the Absaroka Mountains near Yellowstone Park, the San Juan Mountains of southern Colorado, and the tremendous lavas in eastern Washington, eastern Oregon, northeast California, northwest Nevada, and Idaho.

Tectonics would have been ongoing at the same time the Floodwater was draining off the continent (see Part II of Volume I). Tectonic forces would have uplifted, broken up, and tilted some planation surfaces. This is likely the reason there are mountaintop planation surfaces at different levels in the same mountain range, such as the top of the Beartooth Mountains of south-central Montana and north-central Wyoming. (It is likely that many of these mountaintop planation surfaces over the earth are exhumed, after being formed earlier in the Flood.) However, some individual mountain peaks in certain ranges do not show a planation surface while others do, such as in the Wind River and Teton Ranges of western Wyoming (see Figure 33.4 to 33.6).

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[11] Umpleby, J.B., 1912. An old erosion surface in Idaho: its age, and value as a datum plane. *Journal of Geology* 20:139-147.

[12] Mansfield, G.R., 1924. Tertiary planation in Idaho. *Journal of Geology* 32:472-487.

[13] Anderson, A.L., 1929. Cretaceous and Tertiary planation in northern Idaho. *Journal of Geology* 37:747-764.

[14] Oard, M.J., J. Hergenrather, and P. Klevberg, 2005. Flood transported quartzites—east of the Rocky Mountains. *Journal of Creation* 19 (3):76-90.

[15] Oard, M.J., J. Hergenrather, and P. Klevberg, 2006a. Flood transported quartzites: part 2—west of the Rocky Mountains. *Journal of Creation* 20 (2):71-81.

[16] Oard, M.J., J. Hergenrather, and P. Klevberg, 2006b. Flood transported quartzites: part 3—failure of uniformitarian interpretations. *Journal of Creation* 20 (3): 78-86.

It is possible that the same erosion that destroyed the early planation surfaces may have also steepened these peaks.

Figure 57.6. Sarson Stones in the Valley of Stones, Dorchester, south central England that were eroded from a silcrete duricrust.

Duricrusts Form on Some Planation Surfaces

One enigmatic feature on some planation surfaces is a duricrust, defined as a hard crust on the surface generally found in a semiarid climate.[17] Duricrusts are common on the African Surface and planation surfaces in Australia, but less common elsewhere. There are generally four types of duricrusts: (1) ferricrete, an iron oxide crust; (2) silcrete, a silicon dioxide crust; (3) calcrete, a calcium oxide crusts; and (4) bauxite, an aluminum oxide crust. The term laterite is often used for a crust that has oxides of iron or aluminum or both.[18] Duricrusts are considered chemical sediments.

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[17] Neuendorf, K.K.E., J.P. Mehl Jr, and J.A. Jackson, 2005. *Glossary of Geology*, Fifth Edition, American Geological Institute, Alexandria, VA, p. 197.
[18] Neuendorf *et al*., Ref. 17, p. 363.

They predominate are found in tropical and subtropical climates, as the definition states, but they are also found in temperate climates, for example a silcrete cap in southern England.[19,20] When eroded in southern England, silcrete boulders are called Sarsen Stones, some of which reach a length of over 13 feet (4 m) (Figure 57.6). The origin of this once widespread silcrete cap is unknown.

The duricrusts commonly covering the African Surface are mostly composed of bauxite and laterite. [21,22] A fair percentage of silcrete also occurs. [23]

The duricrust can be fairly thick. For instance, the laterite cap on the African Surface in Uganda may be 30 m thick.[28] This hard duricrust cap has been somewhat responsible for the preservation of local African Surface remnants by protecting the erosion surface from being eroded away after the formation of the duricrust (see Figure 56.4).

The formation of duricrusts is not well understood by uniformitarian scientists.[28,24,25] These scientists believe duricrusts likely formed in the past by an unknown process:

> Many authors have declared the duricrusting is now in progress only to a slight extent (Walther; Woolnough 1927); others that most duricrust is fossil and assignable to an epoch when the climate was either wetter or drier and the processes more active.[26]

This statement indicates that scientists really don't know if duricrusts are forming today, since its formation is said to be slight at best. Duricrusts are actively being eroded and destroyed today.[27] Those that assigned duricrusts to some past phenomena do not have a clue, since they could not figure out whether the cause was a wetter or drier climate.

Many geologists simply believe duricrusts were developed within ancient soils.[28] And since they are predominantly in the tropics, uniformitarian scientists theoretically attempt to account for duricrusts by warm climate soil formation, although some believe duricrusts are formed by

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[19] McFarlane, M.J., 1983. Laterites. In, Goudie, AS. and K. Pye, K. (editors), *Chemical Sediments and Geomorphology: Precipitates and Residua in the Near-Surface Environments*, Academic Press, New York, NY, pp. 7–18.

[20] Ullyott, J.S., D.J. Nash, C.A. Whiteman, and R.N. Mortimore, 2004. Distribution, petrology and mode of development of silcretes (Sarsens and Puddingstones) on the eastern South Downs, UK. *Earth Surface Processes and Landforms* 29:1,509–1,539.

[21] Burke, K. and Y. Gunnell, 2008. *The African Erosion Surface: A Continental-Scale Synthesis of Geomorphology, Tectonics, and Environmental Change over the Past 180 Million Years*, Geological Society of America Memoir 201, Boulder, CO.

[22] Chardon, D., V. Chevillotte, A. Beauvais, G. Grandin, and B. Boulangé, B., 2006. Planation, bauxites and epeirogeny: one or two palaeosurfaces on the West African margin? *Geomorphology* 82:273–282.

[23] Partridge, T.C., 1998. Of diamonds, dinosaurs and diastrophism: 150 million years of landscape evolution in Southern Africa, *African Journal of Geology* 101(13):167–184.

[24] Summerfield, M.A., 1983. Silcrete. In, Goudie, A.S. and K. Pye, (editors), *Chemical Sediments and Geomorphology: Precipitates and Residua in the Near-Surface Environments*, Academic Press, New York, NY, pp. 59–91.

[25] Anand, R.R., C. Phang,J.D. Wildman, and M.J. Lintern, 1997. Genesis of some calcretes in the southern Yilgarn Craton, Western Australia: implications for mineral exploration, *Australian Journal of Earth Sciences* 44:87–103.

[26] King, L.C., 1967. *The Morphology of the Earth—A Study and Synthesis of World Scenery*, Hafner Publishing Company, New York, NY, p. 233.

[27] Woolnough, W.G., 1975. The influence of climate and topography in the formation and distribution of products of weathering. In, Adams, G.F. (editor), *Planation Surfaces: Peneplains, Pediplains, and Etchplains*, Benchmark Papers in Geology 22, Dowden, Hutchinson & Ross, Inc, Stroudsburg, PA, pp. 329-338.

[28] De Swardt, A.M.J., 1964. Lateritisation and landscape development in parts of equatorial Africa, *Zeitschrift für Geomorpholgie* 8:313–333.

groundwater and not by soil formation.[29] There are problems with the soil formation hypothesis because the chemicals needed to form a duricrust do not seem to come from the parent material below or by upward migration of the chemicals.[28,19]

It appears that the duricrust is a chemical precipitate that collected on the planation surface soon after formation. This is shown by duricrusts that are folded along with the sedimentary rocks below,[30] and some duricrusts capping a beveled planation surface cut on tilted sedimentary rocks.[28,31] It is thus likely that the chemical that formed the duricrsut precipitated during Flood runoff.

Planation Surfaces Young—Uniformitarian Dates Greatly Exaggerated

Most planation surfaces are considered relatively *young* by many geomorphologists.[32] Evidence of youth is found in the unweathered cobbles and boulders that cap planation surfaces and on the steep scarps on the edges of some plateaus.[33] This agrees with the Flood model, since the formation of widespread planation surfaces occurred in the Retreating Stage of the Flood. Of course, the Flood was only about 4,500 years ago, while uniformitarians speak in terms of tens of millions of years.

On the other hand, some planation surfaces are considered "old."[34] This is unexpected since observed erosion rates are so high; planation surfaces should have been destroyed in a fraction of their supposed age. These older ages, sometimes over 100 Ma (see Chapter 35), are based on fossil and radiometric dating schemes, and the ages quoted are contrary to current erosion rates. Geomorphology provides *objective evidence* that these dating systems are wrong and the dates highly inflated.[35,36,37] Radiometric dating methods are suspect even apart from the conflicting evidence of geomorphology.[38]

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[29] Nash, D.J., S.J. McLaren, and J.. Webb, 2004. Petrology, geochemistry and environmental significance of silcrete-calcrete intergrade duricrusts at Kang Pan and Tswaane, central, Kalahari, Botswana, *Earth Surface Processes and Landforms* 29:1,559–1,586.
[30] Twidale, C.R. and E.M. Campbell, 2005. *Australian Landforms: Understanding a Low, Flat, Arid and Old Lanscape*. Rosenberg Publishing Pty Ltd, New South Wales, Australia, p. 55.
[31] Twidale and Campbell, Ref. 30, p. 183.
[32] Ollier C. and C. Pain, 2000. *The Origin of Mountains*, Routledge, London, U.K.
[33] Crickmay, C.H., 1975. The hypothesis of unequal activity. In, Melhorn, W.N. and R.C. Flemel (editors), *Theories of Landform Development*, George Allen and Unwin, London, U.K., pp. 103-109.
[34] Twidale, C.R., 1998. Antiquity of landforms: an 'extremely unlikely' concept vindicated. *Australian Journal of Earth Sciences* 45:657-668.
[35] Oard, M.J., 1996. Are those 'old' landforms in Australia really old? *Journal of Creation* 10(2):174-175.
[36] Oard, M.J., 1998. Australian landforms: consistent with a young earth. *Journal of Creation* 12(3):253-254.
[37] Oard, M.J., 2000. Antiquity of landforms: Objective evidence that dating methods are wrong. *Journal of Creation* 14(1):35-39.
[38] Vardiman, L., A.A. Snelling, and E.F. Chaffin (editors), 2000. *Radioisotopes and the Age of the Earth: A Young-Earth Creationist Research Initiative*, Institute for Creation Research and Creation Research Society, Dallas, TX, and Chino Valley, AZ.