

Landform terminology—some problems addressed

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Abstract

Landform geography or geomorphology lacks an agreed system of terminology. As a result the meaning of many familiar terms has changed over time, some in response to new interpretations, others because of misuse, and yet others for etymological reasons. Attention is drawn to examples and improvements suggested.

Introduction

In geomorphology and in other fields of endeavour, clarifying and defining terminology is a constant and endless task, for English is a living language. Clear and complete definitions (so far as such are possible with natural features) certainly are helpful, but some that are in common use are flawed, for a number of different reasons. Parallel discoveries have been made in different parts of the world and reported in different terms. The English, for example, that is used in England differs from what is notionally the same language spoken and written in North America (McCrum et al. 1986). In addition, many features are known by more than one English name. By contrast, the same terms have been applied to forms of different origins. The meaning of words and terms has changed with the passage of time, regional terms have become ambiguous when exported, and some names misleadingly imply a given origin. Interpretations have been corrected (at least *pro tempore*, for ideas change). In some instances, there is a conflict between logic and sentiment. These problems make for difficulties both in understanding and in the search for clarification. Although there are various dictionaries concerned with landforms and the processes at work in shaping them, landforms do not feature in any systematic or Linnaean-type classification.

Here attention is drawn to examples of these confusing, and in some instances incorrect, usages as applied to landforms. For obvious reasons the selection of examples in some measure reflects the interests of the authors. No doubt readers with specialised interest and experience in, say, coastal features, are able to cite similar examples of words misused and can suggest necessary or desirable changes in nomenclature from their areas of study. Here, examples that have similar flaws are presented in groups, though some features fit into more than one category.

Misuse of common terms

Some words that are ambiguous are used in the literature despite there being a preferable alternative. For instance, many writers refer to *relict* streams, perhaps for drainage lines that formerly were active but, for whatever reason, have now fallen into disuse. An example is provided by the authors of the seminal paper on 'Relict Early Cainozoic drainages in arid Western Australia' (Van de Graaff *et al.* 1977). But the word 'relict' can be used as either a noun or as an adjective, and the noun can denote a widow, particularly of a prominent person (as in 'Lady X, relict of the late Lord Z'), as well as something originating in the past and implicitly under more-or-less different conditions. The word 'relic' also may be used as an adjective or a noun but it is to be preferred for it has but a single meaning: i.e. of the past or in remembrance. It indicates merely something that existed in former times.

The word *fossil* used as an adjective implies any sign of former life, but is much abused. It is properly used in describing an organism, as in 'fossil tree trunk', but frequently is incorrectly applied, as in 'fossil stream system', which is not organic and for which, as indicated, 'relic stream system' would suffice.

As used in Australia *dam* confusingly is defined as either a construction that impounds water, but also as the water impounded by the structure. The Kangaroo Creek dam is a dam in the first, and we submit, proper sense. However, many use the word for excavations that hold water, and as such are much favoured for a dip on a hot day on country properties; but they are not built structures. The problem is that a suitable alternative is hard to find: 'tank', for example, when included in map legends, for many people brings to mind a metal container or a vehicle of war, and 'water storage' is too general a term.

Historical implies a human connection, a relatively small time span, and, for some, a written record. Thus, 'A geological history of Eyre Peninsula' is inappropriate particularly as *chronology* is available. Some of the most commonly misused words have a temporal connotation but are used in a spatial sense, for example, 'the granite is *sometimes* schistose' and 'the shale is *often* fossiliferous'. In both instances, it is reasonable to ask 'when', whereas one ought to be asking 'where'. Use of the word *frequently* in lieu of *often* or *sometimes* can avoid this dilemma, and in addition can be used of spatial as well as temporal distributions.

Synonyms

Searching for information about a particular landform is facilitated if a suitable name can be stipulated and sought in a dictionary, a text-book index, or a search engine. Unfortunately, some landforms are known by different names according to provenance, author, time or fashion.

Thus, in Australia a *creek* is usually a small river (Coopers Creek, in flood, is an exception), but in Britain it is a river or stretch of a river subject to tidal influences. The stationary crescentic ridges or *lunettes*, of which there are fine examples bordering the eastern margins of Lake Bumbunga at Lochiel and Bool Lagoon in the South-East of South Australia, are also referred to as lee-side mounds and source-bordering dunes, for in the Simpson Desert they occur at the margins of



Figure 1. Massive A-tents, almost 60 cm thick, located on the western midslope of granitic Mt Wudinna, north-western Eyre Peninsula. The compressive force necessary to rupture and lift these slabs argues a powerful earthquake in the recent past

ephemeral lakes and waterways. These are the sources of the sediments of which the lunettes are constructed. Some morphological synonyms usefully indicate contrasts in composition. Thus lunettes composed of gypsum, as is commonplace in southern South Australia, are known as kopi dunes, after the Indigenous word for the dominant mineral (Cockburn 1984, p. 123). Similarly, clay dunes in Texas USA, are source-bordering dunes of a particular composition (Coffey 1909).

An *A-tent* consists of two raised slabs that prop up each other and enclose a triangular void (Figure 1). Most have been attributed to the effects of compression and this mechanism is evident in urban areas where lines of pavers and concrete slabs of pathways buckle and require replacement and repair. Where crestal fractures of naturally-occurring A-tents on the midslopes of granitic outcrops have been mapped, they tend to parallel one another and conform to the orientation of regional stress directions. *Pop-up* is a name given by North American geologists to an A-tent that is known, or is assumed, to have popped up instantaneously as a result of compressive stresses generated during earthquakes. The distinction can usefully be maintained, for although some, perhaps many, of the forms are associated with earth tremors (e.g. Twidale & Bourne 2000), others have developed gradually. This has been demonstrated over almost a century by a family monitoring a site near their homestead in the Darling Ranges of Western Australia (Twidale & Bourne 2003, 2009).

The hydrophilic, swelling or *cracking clays* of American literature, in South Australia are known as 'Bay of Biscay' soils. Elsewhere in Australia they are referred to as crab-hole, melon hole or devil-devil country, as well as several other local and regional names. Of recent years, however, and even outside Australia, the Indigenous word *gilgai* has come into general use (Hallsworth et al. 1955). Some, mistakenly, have referred to this as patterned ground, but that is a term already established for phenomena shaped by frost-heaving in cold lands (e.g. Washburn 1956).

What are perhaps best referred to as *footcaves* (McDonald & Twidale 2011), which are recesses located at the base of an inland cliff, bluff or scarp, are also known as cliff-foot caves, shelters, niches, and overhangs. On the coast they are referred to as *notches* and are located at the base of cliffs in typical rocky coasts. Those developed inland in tropical regions at the base of, say, limestone towers rising from poorly drained alluvial plains, are called *swamp slots*.

Matters of definition

The porosity, permeability and perviousness of particular rocks influence water access but are frequently confused. *Porosity* is a measure of the percentage volume of a rock that consists of voids. In a rock consisting entirely of spherical fragments, porosity is 26% of the total volume, regardless of diameter of constituent grains. *Permeability* is a measure of the ease with which a liquid passes through the body of a rock, by contrast with *perviousness*, which refers to the transmission of liquids via fractures. In the United States, however, permeability and perviousness are treated as the same (Bates & Jackson 1987, pp. 485, 496). This is unfortunate, for it clouds some aspects of understanding landscape. Thus, some clays are highly porous but are virtually impermeable because the voids are not connected, or are so narrow that surface tension interferes with through-flow. Again, granite and other crystalline rocks have a low porosity and permeability but because they are commonly well jointed, are pervious, though perviousness depends not only on the occurrence of partings but also on whether they are open or tight. The roughness or otherwise of the surfaces on opposed faces of the parting also influences ease of transmission.

The impermeability of the rock enhances the significance of fractures in the shaping of the landscape. Fractures are of two types. *Faults* are fractures along which there has been demonstrable movement, whereas *joints* are partings with no obvious dislocation. Fractures disposed in parallel are called 'sets' whereas repeated three-dimensional patterns are known as 'systems'. As fractures are avenues of penetration by waters charged with chemicals and biota, their patterns are reflected in the development of streams and valleys, and hence topography. Thus, the weathering of closely-spaced orthogonal fracture systems in granite produces *corestones* (Figure 2a) and *boulders* (Figure 2b), whereas closely-spaced sets or parallel partings in gneiss, for example, have given rise to *penitent rocks* or *Büssersteine* (Ackermann 1962) or what the South Australian poet Ian Mudie (1963) called *tombstones* (Figure 2c).

Intrusive veins of rocks, such as quartz, aplite, pegmatite, and dolerite, give rise to low ridges if more resistant than the country rock, or to linear depressions or clefts if weaker. But all is relative. Traditionally, *sills* are veins disposed horizontally or at a low



Figure 2(a) Corestones set in a matrix of weathered granite, with one about to be exposed as a boulder at the natural land surface in old quarry, near Palmer, eastern Mt Lofty Ranges



Figure 2(b) Exposed corestone boulders on Palmer Granite outcrop. Two small boulders in the foreground have flared side walls suggesting recent soil erosion and further exposure



Figure 2(c) Penitent rocks in gneiss, near Tungkillo, eastern Mt Lofty Ranges

angle with respect to the horizontal, whereas and by contrast *dykes* (*dikes*) are steeply inclined. This distinction is difficult to maintain partly because of the gradational inclination of veins: what is a vein dipping at 40°–50°? Also, because the alignment and attitude of an intrusive vein may change along its length, then in terms of the traditional definition a sill may become a dyke along the length of the outcrop. Bearing in mind such problems, sills more consistently ought to be defined as planar intrusions that are accordant with structure (typically fractures) and so tend to be linear in plan form. They may form ‘box’ patterns. Dykes, on the other hand, cut across pre-existing structure, and may be of irregular form and surface expression.

Flat or gently-inclined surfaces of limited extent frequently are incorrectly identified. In theory a bench (ledge on the coast) is a structural feature coincident with the outcrop of a resistant stratum or sill, whereas a platform is erosional, and a terrace depositional in origin. Accordingly, the term wave-cut platform, is partly correct but shore platform is preferable because more than wave action—in particular, chemical, biotic, and biochemical processes—is involved in the formation of the feature (Figure 3a). These contributing factors are frequently overlooked. Formerly, a river terrace was used to denote any remnant, or relic, of a former but now dissected valley floor (Figure 3b). While some old valley floors are depositional and ought to be called terraces, some flats are erosional and therefore ought to be described as platforms, and yet others, dissected former valleys, ought to be referred to as benches, for they are structural.



Figure 3(a) Shore platform caused by a mixture of weathering and wave action and cut across dipping sedimentary strata at Hallett Cove, south of Adelaide



Figure 3(b) Fragment of terrace with part of a stream channel preserved within a gully fronting the Willunga (Fault) Scarp, between Willunga and Sellicks Hill, south of Adelaide

Various classifications have been devised for mass movements of rock and debris, but geomorphologists and geographers can usefully distinguish between landslides involving the slippage of material en bloc and earthflows in which friction with bed and sides has caused differential movement or flow within the mobile mass. A landslide, on the other hand, is a movement of rock along a structural surface such as a bedding plane (Twidale & Bourne 2011). An interesting local example is the Lochiel Landslip (Figure 4).



Figure 4 Oblique aerial view of the Lochiel Landslip which formed during the night of 9-10 August in the wet winter of 1974, when a mass of quartzite slipped into the valley along bedding planes lubricated by thin lenses of clay. Left behind were a tension crack and a headwall up to 12 metres high. It continues to collapse as it is being undermined by seepage from the slope above

Use of local names

Several types of granitic inselberg are now recognised (Twidale 1981). The eponymous *bornhardts* (Bornhardt 1900; Willis 1934) or dome-shaped hills, are regarded as the basic feature from which are derived two other types of residual hill (Figure 5a). Block- and boulder-strewn *nubbins*, and known in the United States as *knolls*, are developed primarily in the shallow subsurface in the humid tropics where weathering is intense (Figure 5b), but also in moist sites in drier lands, as for instance in valleys of the fold mountains of central Australia and just to the north of Alice Springs. The castellated *koppies* (kopjes) typical of southern Africa appear to be the result of contrasted rates of weathering as between exposed crests and covered flanks (Figure 5c). After landscape lowering small, steep-sided residuals are exposed.



Figure 5(a) Ucontitchie Hill is a dome-shaped inselberg or bornhardt located some 28 km south-west of Wudinna, north-western Eyre Peninsula. It rises abruptly from a gently sloping, conical rise consisting of mantled pediments



Figure 5(b) Block- and boulder-strewn granite nubbin or knoll, Naraku, north-west Queensland. Note termite mounds on surrounding pediment or plain

Koppies are morphologically similar to *tors* (Figure 5d), the type examples of which are described as 'bare rock outcrops usually of monumental form and about the size of a house' (Linton 1952); though whether a cottage or a mansion is not clear. Tors are found in south-western England and the Bohemian massif, which either are, or recently have been cold (Linton 1955; Demek 1964; Jahn 1974). It is in this sense also that tor is used of the blocky, if in detail ragged or irregular, relatively small, castellated forms developed in schist from the Otago district of South Island, New Zealand (e.g. Raeside 1949; Ward 1951). Unfortunately, Finlayson (1936, p. 39) referred to Uluru and other domical hills encountered during his scientific exploration of central Australia as tors and Noldhart & Wyatt (1962) later applied the term to what are clearly domical inselbergs or bornhardts located on the Pilbara Craton of Western Australia.

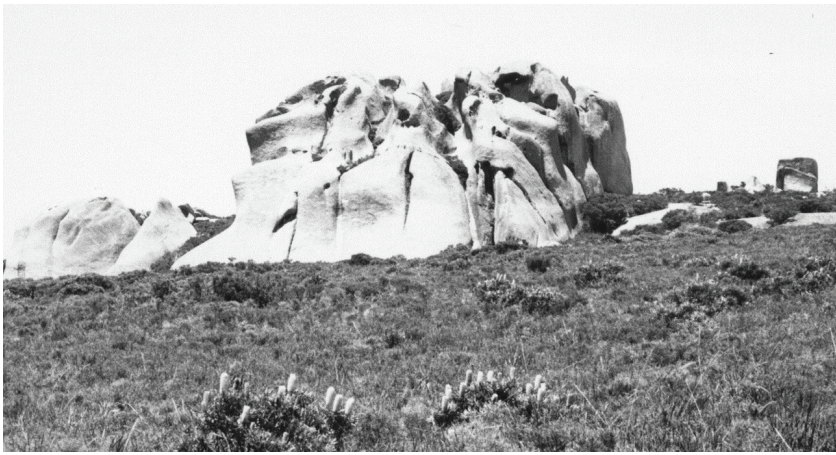


Figure 5(c) Castle Rock, a square or castellated granite hill, a castle koppie or koppie, located east of Albany, near the south-west coast of Western Australia



Figure 5(d) Haytor, a classical tor on Dartmoor, south-western England

Confusion between boulder and tor

Another common difficulty concerns the terms 'boulder' and 'tor'. Boulders are a common feature of granitic terrains (Figure 2b), and are defined in sedimentology (Lane et al. 1947; Pettijohn 1957) as detached rounded rock masses at least 256 mm in diameter, with no upper limit. Their rounding may be due to abrasion during transport by rivers, glaciers or rivers, but 'corestone boulders' (Figure 2a) clearly have developed by differential fracture-controlled subsurface weathering (Scrivenor 1931, pp. 265-365). This usage, and in particular the distinction between castellated hill and rounded boulder was maintained by early geologists working in Australia. For instance, in his account of the Mt Buffalo area of western Victoria, Dunn (1908) tended to reserve the term 'tor' for complex blocky residuals, and referred to rounded isolated forms, some of them of impressive size, either as boulders or rocks as in The Pigeon Hole Rock, The Mussel Rock, The Leviathan, and The Sentinel. Unfortunately and inexplicably, for some of the offenders cherished words, others used 'tor' to denote what clearly are boulders as defined (e.g. Fenner 1931, p. 23; Williams 1936; Hills 1940, pp. 26-28).

Incidentally 'tor' is the word favoured by cruciverbalists for 'hill', just as a 'dune' is for them 'a low sand hill': they ought to climb or attempt to scramble up the flanks some of the Namibian desert dunes!

In light of these ambiguities we suggest that the term be restricted to castellated forms shaped in cold environments, past or present, and implying that gelifraction (freeze-thaw) has played a significant part in their formation; that other castellated forms be known as castle koppies; and that the sedimentary definition of the term 'boulder' be retained.

Skin of the Earth

Drift is an old name for superficial unconsolidated materials, and was so-called because much of it had been transported, travelled or drifted. The word now is conventionally applied to glacial deposits, most commonly basal moraine or glacial drift, rather than to what is known as *regolith* (an example of which can be seen at Point Drummond on the west coast of Eyre Peninsula). This term embraces the soil, which is by definition a weathered mantle containing an organic-rich layer (so that a 'skeletal soil' as used of a surficial mineral accumulation lacking organic matter, is an oxymoron), the weathered mantle, and wash or other transported superficial detritus. By contrast a *saprolith* is a weathered mantle caused wholly by chemical alteration. Similarly, *growan* was used in south western England to indicate a rotted as distinct from disintegrated granite, or *grus* (German, fine gravel), which is the *gruss* of some American authors. But alteration and disintegration go hand in hand and the formation of both growan and saprolith has involved physical as well as chemical processes (e.g. Hutton et al. 1977). Commonly and realistically, *grus* is used in this wider general sense for what is still recognisably weathered granite.

Hold-all (kitbag?) terms

Some words have over time become virtually useless because they have acquired an unacceptably large range of meanings.

Exfoliation is a prime and extreme example of a portmanteau word still widely used in geomorphology. Though evocative it has become useless through indiscriminate use. According to various dictionaries 'to exfoliate' is 'to peel off in layers, flakes or skins'; with the word 'layers' lending an unfortunate imprecision to the definition (Figure 6a). The word was, and occasionally still is, applied to any process that produces layers resembling the leaves of an onion, regardless of whether a millimetre or a metre or more thick: 'concentric scales, plates or shells of rock, from less than a centimetre to several metres thickness ... successively spalled or stripped from the bare surface of a large rock mass' (Bates & Jackson 1987, p. 227).

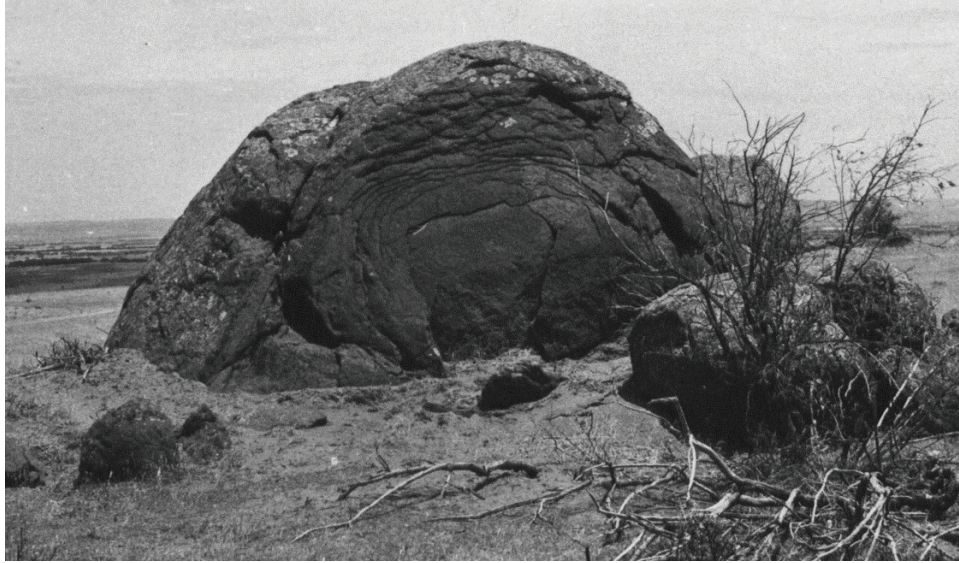


Figure 6(a) Boulder of norite with 'onion-skin' weathering, Black Hill, western Murray Basin, South Australia

Certainly, exfoliation was used in this all-embracing sense by early workers, such as Tate & Watt (1896) who described flakes, plates and slabs from Ayers Rock (Uluru) under this general heading. The two-metre-thick sheet structure known as the Kangaroo Tail was included. Thus, such is the range of thickness accepted by various authors at various times that the word 'exfoliation' is best forgotten. Unfortunately, as well as being of contrasted size, the layers invoked by the description, even some of similar thinness, differ in origin. Laminae, flakes, scales or whatever of the order of a millimetre thickness frequently occur in layer upon layer, in 'books'. They have been formed by haloclasty or the pressure exerted by salts like halite crystallising as they come out of solution, by the intense heat of bushfires as well as, and possibly as a result of, innumerable alternations of heating and cooling, by chemical weathering by groundwaters charged with chemicals and biota in the shallow subsurface. Others are due to the compressive stress generated in earthquakes.



Figure 6(b) Sheet structures or thick slabs developed in granite, exposed on the coast of one of the Pearson Islands, eastern Great Australian Bight

Some words apply to features that appear similar but have been found to be different in origin. Thus 'raised beach' was used of any feature considered to indicate an uplift of the land relative to sea level, despite a beach not necessarily being under consideration, and regardless of whether referring to an uplift of the land or a lowering of sea level.

Changes in interpretation

A further difficulty is introduced when a name with generic implications is accepted. Thus, *offloading joint* (or pressure release joint: several similar terms have been used) was the name given to thick slabs of granitic rocks (Figure 6b) that were attributed to expansion and tension induced by the release of the lithostatic load on deep-seated plutonic bodies by erosional unloading (Gilbert 1904). The idea is particularly plausible in the context of granitic terrains, for granites originated deep in the crust, and their exposure implies the removal of kilometres of superincumbent rock. Indeed, all fractures developed in granite and other plutonic rocks are an expression of erosional unloading. One implication is that all fractures disappear at depth.

Unsurprisingly, the offloading hypothesis is still in vogue as an explanation for these massive slabs (e.g. Sweet & Crick 1992). But later work has shown that they have evolved as a result of crustal compression superimposed on any residual tensional off-loading tendency and the inherent strength of the country rock. Such a tectonic

origin was advocated by several early workers (e.g. Harris 1888; Merrill 1897; Dale 1923). The partings are planes of dislocation or reverse faults rather than tensional joints (e.g. Twidale et al. 1996). Incipient sheet fractures were initiated on Minnipa Hill during an earthquake in January 1999 (Twidale & Bourne 2000). Thus, the name 'offloading joint' is misleading. *Sheet fractures* defining *sheet structures* or slabs are preferable terms.

Incised meanders or meandering streams that have cut deeply into an upland (Figure 7) were for many years separated into two types, namely 'incised' with gorges of symmetrical cross-section throughout, and 'ingrown' forms that are asymmetrical in cross section as a result of lateral migration during incision. Incised meander cut-offs (cf. oxbow lakes) have also been recognised, e.g. one in the Torrens Valley inundated by the Kangaroo Creek Reservoir (Twidale 1964).

It is now appreciated that although they display various degrees of asymmetry all incised meanders are autogenic or formed during incision, as was pointed out by Mahard (1942). Only the degree of asymmetry varies. Despite this, incised meanders have been construed as inherited from, and evidence of an upland surface of low relief (e.g. Campana 1958).



Figure 7. Incised meanders of the Harrison/Reedy Creek, eastern Mt Lofty Ranges, showing Hillydale homestead and Palmer cemetery near the mouth of the gorge

Recognition of sub-types

A *pediment* was formerly taken to be a gently inclined smooth slope located between a backing scarp and the valley or basin floor (Figure 5a). It was said to be erosional and shaped by running water. Further investigation has identified three subtypes are now recognised. The *covered pediment* conforms to the original definition, but the most commonly occurring *mantled pediment* is due to weathering, and a *rock pediment* is described when the mantle has been removed to reveal the weathering front or weathered bedrock surface. *Platforms* are rock pediments lacking a backing scarp. Like laminae, scales, and flakes, covered and mantled pediments are convergent forms or features of similar morphology but different origins.

Rock basins or *gnammas* are caused by weathering, whereas *potholes* result from abrasion and attrition in river beds or on rocky coasts like the Talia coast of western Eyre Peninsula. 'Gnamma' means hole, so that the occasionally used 'gnamma-hole' is tautological (just as is 'Gondwanaland,' for 'Gondwana' means 'land of the Gonds', a tribe of the Indian peninsula). Many gnammas originate as saucer-shaped depressions in the weathering front, that is, the base of the regolith (Mabbutt 1961). Many are located on fractures or intersections of fractures or on pods of minerals particularly susceptible to chemical alteration and hence to erosion.

After exposure, the depressions become morphologically differentiated according to rock structure and slope into hemispherical *pits*, shallow, flat-floored *pans*, and *armchair-shaped hollows* (Twidale & Corbin 1963). Where, as has occasionally occurred, the basin penetrates through the base of a sheet structure or slab, water escapes along the parting and the pit becomes a 'cylindrical hollow' as a result of the abrasion accomplished by swirling waters armed with sand (Twidale & Bourne 1978).

Logic or sentiment: duricrusts

Some of the various *duricrusts*, the accumulations of minerals such as iron oxide, silica, gypsum, or calcium carbonate, are commonly found as a constituent of, or capping to, weathering profiles (Figure 8). Whatever their composition, they form caprocks, and when dissected give rise to plateaux, or where subsequently folded, cuestas, and so on (e.g. Wopfner, 1960). Even 'gypcrete' is cohesive and relatively resistant to weathering and erosion in an arid environment, and thus forms the cliffed western shoreline of Lake Eyre (Wopfner & Twidale 1967). Also, where originally located in valley floors, they have induced relief inversion (e.g. Miller 1937; Twidale et al. 1985; Partridge & Maud 1987).

Some duricrusts evidently are convergent forms of contrasted origins; for though most are pedogenic concentrations, many siliceous crusts, and some ferruginous and carbonate examples are related to the desiccation of streams and stream deposits. Moreover, some surficial materials labelled 'silcrete' do not differ from orthoquartzites, while some authors reserve the word for surficial siliceous rocks of porphyroclastic texture, regardless of whether the matrix is crystalline or amorphous. Mainly, however, questions of duricrust terminology pit history against logic.

The names accorded some duricrusts comprise a prefix indicating mineralogy, and a suffix '-crete', after the Latin *concretus*, hardened. Lamplugh (1902) coined the term 'calcrete' for a layer, which in the particular instance he cited is sporadically cemented by calcium carbonate. He further recommended that the prefix-suffix system be extended to include 'silcrete' and 'ferricrete'. The calcareous duricrusts widely developed in southern South Australia well illustrate some of the problems discussed in this paper 'Calcrete' is a pedogenic accumulation but has in the past been called 'travertine', which is now restricted to spring or riverine deposits (e.g. Jack 1912).

Some workers, however, (e.g. Goudie, 1973) have suggested that this logical and informative nomenclature be extended to embrace all the common types of duricrust, so that not only does 'calcrete' supersede regional names such as caliche (United States, Mexico), kunkar and kankar (India), but 'alcrete' would replace 'bauxite', and 'ferricrete', 'laterite'.



Figure 8 Laterite, consisting of a white clay with a ferruginous capping, as in the flat-topped hill, resulting from the weathering of granite, seen here at The Granites, near Mt Magnet, Western Australia. Dissection and erosion of the laterite has exposed boulders of fresh granite in the valley floor in the foreground

Contrary arguments to this logical scheme are based largely—though not entirely—in sentiment rather than reason. Thus, to some it would be a pity were ‘bauxite’ to become ‘alcrete’, overlooking that the material was discovered at Les Baux, near Arles, in southern France, and eventually took its name from the site— eventually, because originally it was known as ‘beauxite’.

Another difficulty for some traditionalists who value the historical context and like to recognise and acknowledge the work of earlier workers concerns the suggestion that ‘ferricrete’ replace ‘laterite’. When first noted by European travellers and surveyors in India, weathering profiles characterised by a B-horizon rich in iron oxide and underlain by a more-or-less thick and frequently kaolinitic, mottled and pallid zone were called ‘laterite’ from the Latin, *later* = a brick (Buchanan 1807, pp. 436-460), and later, ‘brickstone’ (Babington 1821). These names were deemed appropriate because the material was widely used for making building bricks on the subcontinent.

The historical aspect of the name ‘laterite’ is one reason for retaining it in preference to ‘ferricrete’ to denote the entire weathering profile, including the iron-rich layer. Another is that if ferricrete were exempted from this restricted meaning it would be available to indicate those many superficial ferruginous crusts lacking a profile that have accumulated in various settings in many parts of the world (Lamplugh 1902; Twidale 1976, pp. 196-197); though the name ‘iron-pan’ would serve the same purpose.

Conclusion

Language is misused in several contexts and ways, but whether the modifications implied here will ever be adopted, is doubtful. Convention and habit are difficult to overcome, and just as it is unlikely that the distinction between coastal cliff and river bluff will be adopted—will the cliff-foot caves at the base of Uluru ever become bluff-foot caves?—so it is difficult to envisage river terraces becoming river platforms. And as the discussion of duricrust nomenclature suggests, at times the heart can with benefit rule the head.

Acknowledgements

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