

De Chételet, E., 1938: Le Modelé latérique de l'ouest de la Guinée française. *Revue de géographie physique et de géologie dynamique*, 11(1): 5-120

[A translation by Janeen Samuel of pp 76-80 – Chapter II, sections IV, Grottes dans la laterite; and V, Lacs et depressions des bowals.

NB: on p.57, at the start of chapter II, De Chételet indicates that the Foulas use "**Bowal**" to name a flat surface, lateritic or not, that is semi-desert and not possible to cultivate. The plural in the Foola language is "bové", but others use "bowals", as he does. He restricts the term to flat or undulating erosional surfaces characterised by a continuous lateritic duricrust.]

IV – Caves in laterite

I have already reported the caves in laterite in my article on the subdivision of Youkounkoun. [footnote: E. de Chételet, op cit, p.144; see also H. Huber, Grottes et cavernes de l'Afrique occidentale. *Bull. du Com. d'Et. Hist. et Sc. de l'A. O. F.*, January-March 1920, p.1-12.] These caves in the small hills of Bassaris are very numerous and during my last sojourn in Guinea (1935) I had occasion to visit several of them. A number of them are still unexplored, and others, because of their sacred natures in the eyes of the natives, I was unable to visit.

Most of these caves are found in the large lateritic escarpments on the uplifted[redressés] schists that dominate the peneplains of Youkounkoun. Others are found at a lower level, in the bowals cut by the valley of the Senini and its tributaries near the villages of Doy-Doy, N'Debou etc... Since the laterites of the Bassaris hills form a laterite scarp of several metres, the cavities are numerous and may become true caves.

The caves of Negare, Guigan, and Andeff, are found in the large scarps facing west, where the laterite complex may reach 50 metres.

Probably for orogenic reasons, the hydrostatic level has dropped considerably since the formation of the upper laterites.

Under a rigid bed of duricrust [cuiresse] whose thickness reaches 5 metres in places, the underlying laterites have become friable, although their components (nodules) have become hardened.

At the present, the action of subterranean water seems to me to be very limited, and, according to the natives, even during the rainy season the caves are relatively dry and are used for religious ceremonies. For myself, I have never seen any stalactites, stalagmites, lakes nor springs. In some places one may see a slight efflorescence.

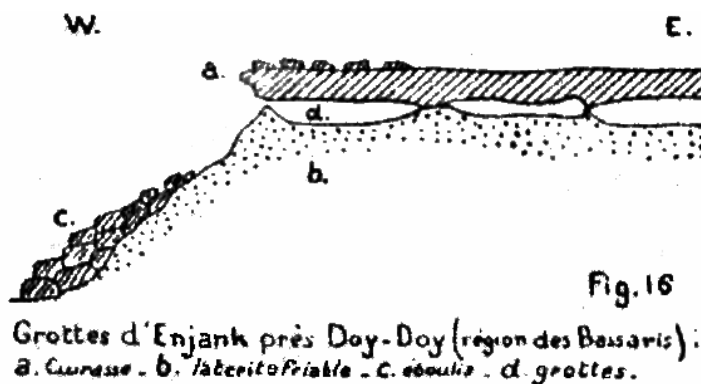
In the caves of Negare (Pl XIV, fig 3), the separation between the duricrust and the laterite is not clear-cut. An imposing entrance, strewn with blocks fallen from the lower part of the duricrust and with nodules, gives way to a narrow passage communicating with other chambers. The natives claim one can cross the bowal via these chambers.

At Andeff, the caves are very numerous, but not very deep and there is a fairly clear separation between the duricrust ceiling and the laterite which is so friable that it comes apart under the pressure of a finger.

In the caves of the valley of the Senini and of the N'Debou, the distinction between the duricrust and the friable laterite is extremely clear, following a horizontal level. The chambers occur only in the friable laterites, their maximum height is rarely over two metres and becomes progressively less; their floor is scattered with bat guano and nodules from the crumbling/frittering.

Passages connect the chambers, and pillars support the roof. With crumbling of the pillars, the roof can collapse and partly block cave entrances. At the caves of d'Oghel, east of Engomana village, fallen plates may be more than 10 metres wide and about 2 metres thick.

When one walks over certain of the bowals of Bassaris, for instance near Doy-Doy, one's footsteps echo, which would seem to indicate caves and cavities under the duricrust which is thin but rigid and resistant (Fig 16). Exploration of these caverns is painful, because of the stifling heat, the smell of bats and the lowness of the chambers and passages which means that one has to crawl.



The conditions for formation of these caves must be a thin tough duricrust (about 1 metre thick), without any fissures, and a zone of very friable laterite underlying it.

These caves must, at a relatively distant time, have been filled with subterranean water, in places with true watercourses which removed and carried along material from the zone of concretion[?]. At the present time, the whole of the upper laterite at least (by which is meant the friable laterites) is in the state of dead laterite. There may still be some enlargement or blocking of the caves by crumbling of the walls and pillars, helped by seepage of water which could carry particles to the surface.

Some small caves in laterite may be found in the lower bowals [bas-bowals] of the peneplains (Bignan caves). I have never seen any in the high-bowals of the Fouta, nor in the bauxite plateaux of the Bové region.

V. – Lakes and depressions in the bowals.

I have already had occasion to speak briefly of the ponds with lateritic bottoms which form on the surface of the bowals during winter. these ponds disappear by infiltration and more by evaporation, during the dry season (Pl XV, fig 3). Some of them can last all year round, fed by the bowal springs (Pl XV, fig 2).

Diamatou Marshes. – These extensive marshes are made up of a large depression with a laterite bottom, without any essential modification of the topography. Sandy muds partly fill this depression, which is fed by springs and seepages from deep down. During the dry season, the Diamatou marshes partly dry up, and on the muddy sands is formed, by evaporation, efflorescences of rock salt which are exploited by the locals.

The formation of the depression is apparently due to a compaction[tassement] of the lateritic duricrust. The diminution in volume of the laterites, or of the rocks beneath, by emigration of dissolved or suspended particles towards the surface, would have brought about the depression of the duricrust.

A tectonic origin of the lateritisation could be envisaged.

Vendous – The little permanent lakes which are found in the undulating bowls of the Bové region are called "vendous" by the locals. Some of these vendous are shown on the 1:200,000 map of the geographic service of the A.O.F. (Koumbia sheet: Lingourou vendou, Bourou vendou, Léla vendou, etc. ...). Others, such as Sinthiourou vendou, Termessé vendou, etc..., have not been mapped.

Although they are morphologically different, one can group with these vendous the lakes of Dinton (Cercle de Boffa) and of Kaboya, west of Boké, which are also found in laterite (Pl XV, fig 1).

Vendous are true small lakes, characterised by:

1: A basement of schist, overlain by a duricrust where nodular bauxitic laterites predominate.

2: A lateritic base, thinly covered with mud.

3: Being situated at the bottom of gently sloping amphitheatres, where the duricrust is bare and poorly vegetated. In contrast, a ring of exuberant vegetation rims the edge of these lakes.

4: No permanent streams feed these lakes. The transfer of material from the denuded surface of the amphitheatre is practically nil.

5: One often sees springs all around these lakes, and they are fed by underwater springs. The water level may go down during the dry season, but at the present epoch they never dry up.

6: The lakes nearly always have a permanent outflow which has cut down a little into the duricrust near its rising.

At the Kaboya and Dinton lakes, the laterites are rather ferruginous and the slopes of the amphitheatres are steeper and poorly covered in the products of landslips.

The Kaboya lake is only 1.5 m deep during the dry season, and its level scarcely changes in the rainy season.

The Dinton lake is partly filled with silt and lateritic products, but the peripheral and underwater springs gush abundantly all the year.

In all these lateritic lakes I have never seen, where such is possible, any difference between the submerged laterite and that which is permanently exposed.

Hypotheses on the origin of the vendous. – I can only hypothesise on the origin of these laterite-bottomed lakes. One could assume that they were formed under permanent water, which would have given laterites analogous to the "lake laterites" of Mr Fermor.

The laterites of the high parts of the bowls and that of the lakes are not perceptibly different.

Let us set aside the supposition and examine the following hypothesis:

1: These depressions existed before lateritisation: the establishment of this phenomenon and of different climatic conditions has permitted the formation of laterites at the bottom of the basins.

2: The lakes were formed by tectonic movement; this supposition can be applied to the Diamatou marshes and to the lake at Dinton. There is no way of applying this theory to the vendous of the Bové region.

3: An aquifer level formed under the duricrust of the amphitheatre and, on reaching the level of the lake, flowed out via peripheral and underwater springs, thus bringing about the compaction of the lateritic duricrust of the basin and clearing the sediments from the bottom of the lake.