

Francois and Paul Ellenberger – Main types of vertebrate footprints in the Stormberg beds of Basutoland (South Africa). (Preliminary note).

In earlier notes<sup>1</sup> we drew attention to the Stormberg Series of Basutoland (end of the Karroo beds; from bottom to top: Molteno, Red Beds, Cave Sandstone, according to F. von Huene going from the end of the Middle Triassic through the Rhaetian). Other than skeletal remains, interesting vertebrate footprints are locally visible in nearly all of the levels, actually always rare and sometimes poorly preserved<sup>2</sup>. For the most part unpublished on, they will be illustrated and described in detail (plaster casts of the better trackways are now deposited in the Museum d'Histoire Naturelle in Paris, the Morija Museum (Basutoland), and, partly, in the Bloemfontein Museum. We summarize here the main types we see: (A, B, G, L, M, N are counterparts [casts] in fine-grained eolian sandstone; the others are impressions in lacustrine sandstones; K is fairly rough and could be an undertrack).

a) *Tridactyl bipedal trackways*. Type A (we've figured an exceptionally long trackway) with its variants such as B reaches the highest speeds of the well-known footprints from the Cave Sandstone (Qalo; Tsikaone; Morija slabs). These are the most running dinosaurian tracks ("*Brontozoum*"). It's about large bipedal saurischians, perhaps carnosaurus (the claws are sometimes very marked). However von Huene, studying a footprint housed in Bloemfontein (*Ichnites euskelosauroides*) attributed these trackways to a prosauropod<sup>3</sup>, or *Basutodon* (oral comm.).

However in the Red Beds and often in the Molteno as far down as its base, are tracks almost identical to A (but whose claws are less marked?), whose dimensions vary: sites at Seobong, Qeme (C), Seaka (F). Footprint F is almost identical to *Eubrontes* of the Connecticut Triassic<sup>4</sup>. Bipedal saurischians are thus abundant in the Karroo from the start of the Stormberg and coexist with cynodonts (such as *Scalenodontoides* found by one of us (P.E.) in 1956 at Morobong<sup>5</sup>. Trackways D and E at Seobong, can be deformed, are of a particular type, perhaps varying from the preceding types (footprints slightly resembling E exist since the upper Beaufort near Hermon).

Very different are the small *birdlike [aviform] tracks* (Thejane near Maphutseng) of which J is an example of the largest. One sporadically sees it in all the [Stormberg]

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Ellenberger, F. and P. Ellenberger. 1958. Principaux types de pistes de Vertébrés dans les couches du Stormberg au Basutoland (Afrique du Sud) (Note préliminaire). *Compte rendu sommaire des séances de la Société Géologique de France*, for 1958, pp. 65-67. Translated by E.C. Rainforth, October 2002.

<sup>1</sup> Ellenberger, F. & P. (1956): Quelques précisions sur la série du Stormberg au Basutoland (Afrique du Sud). C.R. Ac. Sc. V. 241, p. 799. – Le gisement de Dinosauriens de Maphutseng (Basutoland, Afrique du Sud). C.R. somm. S.G.F. p.99.

<sup>2</sup> Ellenberger, P. (1955): Note préliminaire sur les pistes et restes osseux de Vertébrés du Basutoland (Afrique du Sud). C.R. Ac. Sc. V. 240, p. 889.

<sup>3</sup> Huene, F. von. (1932): Die fossil Reptil-Ordnung Saurischia, ihre Entwicklung und Geschichte. Monog. Geol. und Pal., Berlin, p. 213-214, fig. 19.

<sup>4</sup> Lull, R.S. (1955). Triassic life of the Connecticut Valley. Hartford. [Translator's note: this should be Lull 1953.]

<sup>5</sup> Crompton, A.W. & Ellenberger, F. (1957): On a new cynodont from the Molteno beds and the origin of the Tritylodontids. Ann. South Afr. Mus., v 44, p. 1-14, pl.I.

Series, often in the Red Beds. They appear very close to *Anomoepus* (Connecticut, etc.) sometimes attributed to primitive ornithischians<sup>6</sup>.

b) *Tetradactyl bipedal trackways*. The nice trackways G (Cave Sandstone, Leribe) with perhaps an opposable big toe evoke a gracile saurischian. Trackway K is very different (Molteno, near Seaka), pseudoplantigrade, with large blunt claws. It resembles *Otozoum* from Connecticut a little, it is perhaps only seemingly a biped, but in any case poses the same problem of affinity (prosauropod?).

c) *Quadrupedal trackways*. The same site at Soebeng has 2 curious well-preserved trackways, whose affinity for the moment is enigmatic: H could be considered to be a degenerate *Cheirotherium*; it evokes a pseudosuchian (or at a push, a small sauropod?). I, a very beautiful trackway of a straightforward quadruped, with a heavy front end, unguigrade or digitigrade, pentadactyl, which could according to A.W. Crompton be close to a pseudosuchian such as *Erythrosuchus*; one could also imagine a huge burrowing Theromorph or a large amphibian.

d) *Small footprints in "Triassic loess"*. Washed-out surfaces with worm traces (silk marks) in the red siltstones of the lower Cave Sandstone at Leribe are supplied with small traces, some apparently tetradactyl, with impressions of creased scaly skin (M), others pentadactyl (L). The last evoke small Theromorphs.

*Conclusion*. All attempts at direct attribution of our tracks to the various skeletal remains known from the south African Stormberg are premature, considering the inadequacy of the respective documents [remains?]. But from now on and especially in the Molteno, it's the recently discovered footprints that will allow us to catch a glimpse of the biological landscape of huge variety.

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<sup>6</sup> Lessertisseur, J. (1955): Traces fossils d'activité animale et leur signification paléobiologique. Mém. Soc. géol. France, nouv. sér., v.34 no. 74.