Footprints of small fossil reptiles from the Karroo rocks of Cape Colony / by H.G. Seeley.

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Footprints of small Fossil Reptiles from the Karroo Rocks of Cape Colony.

By H. G. Seeley, F.R.S.

No record has hitherto been published of the footprints of the animals which have left their remains so plentifully in the Karroo rocks. I examined a considerable area of the Colony in the search for these evidences of the habits of the animals without success; and neither Mr. Thomas Bain nor Dr. Kannemeyer had ever met with any footprints in the rocks. Suitable surfaces for their preservation are not uncommon in large exposures of ripple-marked shale which occur on the Pareiasaurian horizon.

One small slab is preserved in the palæontological museum of the University of Munich, where it has remained since 1880. It is labelled "Middelburg," presumably the well-known locality in the north-east of Cape Colony, and with it is a small new Theriodont skull from the same locality which, when the matrix is removed, may prove to be allied to *Hyorhynchus*.

When I drew the attention of the late Professor K. v. Zittel to the interest of the specimen, he had a cast made and placed in my hands for description. This cast has been presented to the Natural History Museum, Cromwell Road.

The small block of fine sandstone, where it is broken at the edge, shows the impressions of bones of small digits, which terminate in sharp compressed claws, making an interesting difference from the absence of bones with footprints in the Trias of this country, which may lead to a future discovery of definite association of footprints of South-African reptiles with the bones of animals which made them, as the reward of systematic exploration.

The surface of the slab appears to be crossed by two or three faint parallel marks an inch or two apart, which are probably ripple-marks, and the larger footprints tend to cross these obscure markings at an angle of about 45°. At least three animals are indicated varying in size. The largest has the feet about the size of those of *Procolophon*, and shows a similar stoutness and divergence of the digits, so that the prints may be provisionally referred to that genus; but the

smaller animals have the digits parallel and indicate types of which the skeleton is undiscovered. The footprints are in relief and, owing to the nature of the sediment, are fairly sharp, but the terminal extremities of the digits appear in some cases to be broken.

The fore and hind feet of the left side of the *Procolophon* type of animal are shown in close sequence. The fore foot (fig. A) is slightly the smaller and less perfectly preserved, and is slightly obscured on the inner side by the overlap of a small foot with four digits. Behind this pair of footprints the cast shows a short longitudinal impression (fig. C), which in relief is concave from side to side, with a narrow median line, and shows a quincuncial pattern of small pits. This marking seems to indicate a fine granular ornament of the skin on the under surface of the tail at a point one inch and a half behind the left hind foot. As the marking extends forward on the slab it becomes obscure. If it is correctly referred to the tail of the same animal it shows such a mark as might be made by the extremity of the tail of *Procolophon*, which is well known.

In both fore and hind feet the moderately stout digits terminate bluntly without any indication of terminal claws, though this may result from the condition of preservation of the impression. The digits diverge on a splay-footed plan, so that the first makes an angle of nearly 90° with the fifth. The middle digit appears to be the longest, and the first, second, and third appear to be stronger than the fourth and fifth. The fifth digit of the hand is obscure. The digits are more impressed than the metacarpal and metatarsal regions, and there are deeper impressions on the inner than on the outer side. The width of the hand did not greatly exceed one inch, and it may have been an inch and a quarter long, though its hinder border is not well defined.

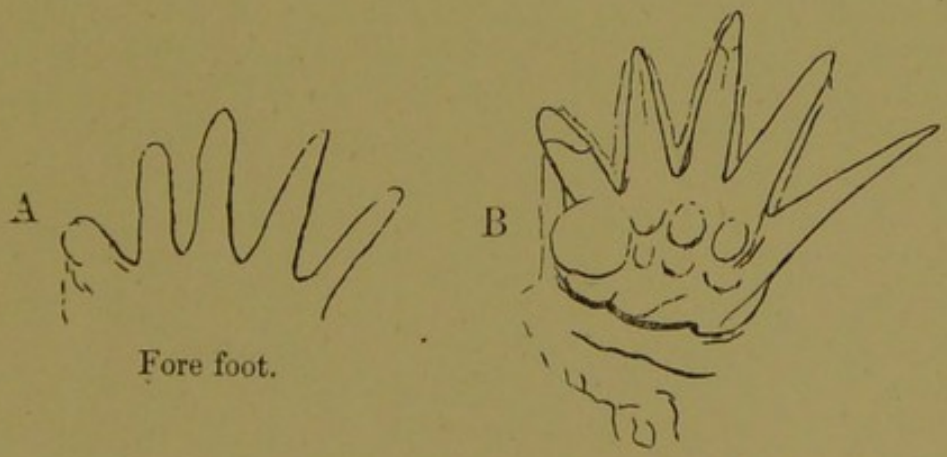
The impression of the hind foot (fig. B) immediately follows the fore foot. The front to back measurement over both impressions is two and a half inches. The transverse width between the extremities of the first and fifth digits is one and a half inches; at the tarsal margin the width is eight-tenths of an inch. The digital impressions become narrower from the first to the fifth, which is slender and faint, so that its terminal extremity is ill-defined. The third, fourth, and fifth digits appear to be of equal length, but this may result from the extremity of the third being lost.

The comparatively short metatarsal area is defined by a series of fleshy convexities in the lines of the several bones, with shallow grooves between them. The first metatarsal

bone is the shortest and supports a prominent ball-like convexity, which extends a little inward laterally beyond the digit. The convexities over the distal ends of the second, third, and fourth metatarsal bones are much smaller; they are similar to each other in size and elevation. There is no convex pad on the fifth metatarsal. The transverse hinder tarsal margin of the impression is formed of three convex curves—one behind the first metatarsal, the second (wider) behind the second, third, and part of the fourth metatarsals, and the third (smaller) behind the fourth and fifth metatarsals. These curves appear to indicate the structure of the proximal row of the tarsus.

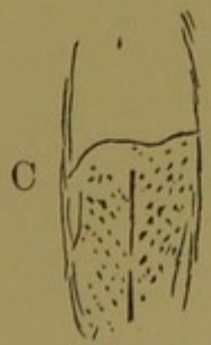
If these footprints prove to belong to *Procolophon*, it is not impossible that the Cheshire footprints, which most resemble them, may prove to belong to *Telerpeton*.

The smaller footprints are isolated and less well preserved. They appear to indicate animals in which the digits were four in number, with three of them close together, resembling some small types from Storeton in likeness to the human hand, being relatively narrow.



Fore foot.

Hind foot.



Caudal (?) impression.

The larger footprints from Middleburg.