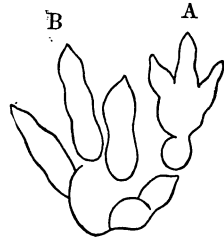


ART. XXXV.—Note on the probable Footprints of *Stegomus Longipes*; by R. S. LULL.

THE discovery of a nearly complete specimen of *Stegomus* in the Triassic sandstones of the Connecticut Valley proves a great boon to the student of footprints, for it at once affords a clue to the interpretation of a most remarkable series of quadrupedal tracks which are included under the ichnite genus *Batrachopus* (*Anisopus*) of Hitchcock.

Briefly characterized, these tracks were made by a series of forms truly quadrupedal in gait, with a tetradactyl pes and a pentadactyl manus, the latter being considerably smaller and rarely showing the impression of all of the digits; sometimes four, generally but three leaving their imprints. The phalangeal pads are generally distinct and betray a formula which at once places the group among the diaptosaurian reptiles, while the acuminate claws seem to imply a carnivorous mode of life.

In one feature this genus separates itself sharply from most Reptilia, and that is in the extremely long stride in proportion to the length of the pes, the ratio of foot to step being on the average as one to six; this together with a very narrow trackway, shown by the footprints being nearly in a right line, would indicate a creature with long stilted limbs and a gait like that of a cursorial mammal. Edward Hitchcock (*Ichthyology of Massachusetts*, Boston, 1858, pp. 62, 63) recognized the saurian nature of the group, but could not reconcile the limb proportions with those of any known



Footprints of *Batrachopus gracilis* E. Hitchcock, Natural size. A manus, B pes.

reptile, hence he reasoned that they might have been mammiferous. The inequality of the fore and hind feet together with the remote age of the impressions suggested to him the marsupials, and he says finally that: "although the marsupial type must have predominated the . . . crocodilian characters . . . ought not to be overlooked, and therefore I call the animal a *Loricoid Marsupialoid*."

Lull, in his recent memoir (*Mem. Boston Soc. Nat. Hist*, vol. 5, No. 11, p. 482), thought that *Batrachopus* might represent a survivor of the ancient dinosaurian stem from the very dinosauroid pes, which, though tetradactyl, with all of the digits pointing forward, is of such a character that the typical dinosaurian foot could readily have been derived from it. The long-limbed *Kadaliosaurus* strongly suggested the genus under con-

sideration, which was therefore provisionally placed in the order Protorosauria of Seeley. A comparison was made however between *Batrachopus* and *Aëtiosaurus*, but those forms described by Fraas lacked the proportions necessary to correlate the two genera.

In the *Aëtiosaur* (*Stegomus longipes*), described by Emerson and Loomis on p. 377 of this number, we find a form whose stilted limbs and comparatively narrow body give it just the proportions one would suppose *Batrachopus* to have, and a careful comparison with the wealth of material contained in the Hitchcock ichnological cabinet of Amherst College seems to correlate it beyond doubt with the species *Batrachopus gracilis* E. Hitchcock, for the correspondence in size is exact.

The genus *Batrachopus* contains three typical species, *B. deweyanus* E. H., the type species, *B. dispar* Lull, and *B. gracilis* E. H. the last presenting at least two varieties differing from each other mainly in size, each being in this respect comparatively constant, though gradational specimens do occur. Of these varieties the type specimen, the one here figured, that described by Hitchcock,\* is of the smaller phase, and it is with this that *Stegomus longipes* agrees, while the larger form is that described and figured in the author's memoir (loc. cit., p. 484, fig. 3). These two forms are mainly from two localities: the typical variety being seen most commonly on a ripple-marked gray shale from the Horse Race near Gill, Massachusetts, the slabs being covered with tracks running in every direction as though the creatures were gregarious in habits, as the specimen of *Aëtiosaurus* described by Fraas† would also seem to indicate.

The larger variety has its typical locality at the Lily Pond quarry at Turners Falls, Massachusetts, which has yielded so many of Hitchcock's types, and the specimens are for the most part beautifully preserved impressions on a dark red shale, which preserves detail with wonderful fidelity.

Geographically *Batrachopus gracilis* ranges from Massachusetts through Connecticut, New Jersey and Pennsylvania, and hence it is sufficiently numerous and widespread to be among the species most likely to be preserved as fossils.

If one may judge from relative size, it is possible that the footprints of *Stegomus arcuatus* Marsh‡ are those to which the name *Batrachopus dispar* Lull has been given.

It would seem therefore that the correct placing of *Batrachopus* would be not among the Protorosauria but in the sub-order *Aëtiosauria* of the order *Parasuchia* of Huxley.

\* Mem. Amer. Acad. Arts and Sci. (2), iii, p. 228, pl. 16, fig. 3, 4.

† Württem. naturwiss. Jahres., xxxiii, 1877.

‡ This Journal (4), ii, p. 59, pl. i.