XVII. "Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. Part IX. Section 6. Associated Remains of two small Specimens from Klipfontein, Fraserburg." By H. G. SEELEY, F.R.S. Received June 21, 1894.

(Abstract.)

The author obtained parts of two skeletons from the summit of the Karroo rocks, which form the Nieuwveldt range. They resemble Theriodonts in their general marsupial characters. The fragments of skulls are not in the same slabs with the other bones.

Theromus leptonotus shows the fore-limb and some vertebræ. The humerus is determined to be Theriodont by the transverse extension of the proximal articulation. The bone is $1\frac{4}{10}$ inches long, resembling in form that of the Phalangers. The ent-epicondylar foramen is more vertical than in the marsupials; and, as among marsupials, the radial crest if prolonged distally would be continuous with the bridge over that foramen. The vertebræ are each $\frac{3}{10}$ inch long; they show a transverse suture between the neural arch and the centrum.

The anterior part of the skull, very imperfectly preserved, indicates three incisor teeth with the root of a relatively large maxillary canine, but the region of the molar teeth is lost. There is also a posterior fragment of a skull, which makes known the bones of the palate and the base of the brain case seen from above. Enough is shown to indicate Theriodont characters, but the animal appears to diverge from the Theriodonts towards the Dicynodont type. If the base of the skull belongs to the same individual as the snout, it indicates a head nearly $4\frac{1}{2}$ inches long.

The second specimen shows 14 dorsal vertebræ, which occupy a length of $5\frac{1}{4}$ inches; each slightly exceeds $\frac{3}{10}$ inch in length, so that this animal named *Herpetocheirus brachycnemus*, is similar in size to the fossil previously described.

The centrum is deeply biconcave. There is no indication of a capitular articulation for the ribs. The ribs are slender, and the longest are $2\frac{1}{2}$ inches in length. There is no trace of the transverse expansion seen in *Cynognathus*, although the ribs preserved indicate 20 dorsal vertebræ. The humerus is $1\frac{6}{10}$ inches long, and is exposed on the superior aspect. It is distinguished from the type already described by wanting the tuberosity on its inner distal border, which has a convexly rounded contour. The radius is stronger than the ulna, but there is no indication of an olecranon process exposed. The ulna is no stouter than a rib. These bones are an inch long. The carpus shows one large bone below the radius; there is a smaller

bone on its outer side, which corresponds to the distal end of the ulna, but there is no trace of a third bone preserved, and there is only one central bone preserved. There are three phalanges in a digit. The femur is $1\frac{9}{20}$ inches long; its articular head appears to be small and hemispherical. There is a large internal trochanter extending down the shaft, which corresponds with the similarly placed ridge in the femur of Megalosaurs and other Saurischia.

The slender character of the ribs, which are different from those in known Theriodonts, suggests the possibility that these remains belong to a group distinct from both the Cynodontia and Gomphodontia.

A small badly preserved fragment of a skull found near to this fossil is described, but there appears to be no sufficient evidence for associating it with the other remains.

XVIII. "On the Evolution of the Vertebral Column of Fishes."

By H. Gadow, Ph.D., F.R.S., and Miss E. C. Abbott.

Received June 20, 1894.

(Abstract.)

Concerning the segmental mesodermal products the following subdivision is adhered to:—

The term *myotome* is to be restricted to the whole rest of the protovertebra after the skeletogenous cells have been given off for the production of the *sklerotomes*.

The sum total of the sklerotomes makes up the skeletogenous layer.

The ending *tome* to indicate the primary, or earlier, less differentiated; the ending *mere* to signify the final condition or product.

Consequently, the protovertebræ divide into—I, Myotomes, each of which produces (1) one myomere or segment of the general mass of trunk-muscles, (2) cutis; II, Sklerotomes which produce skleromeres or skeletal trunk segments.

Each protovertebra produces a dorsal and a ventral sklerotome; strictly speaking, one sklerotome which consists of a separate dorsal and ventral half.

The protovertebral segments are not transverse "plates," but are curved into S-shape, the top end curving tail- and inwards, the middle and ventral thirds bulging headwards, the amount of curvature being (in 7 mm. embryos of Acanthias) so great that a transverse plane will cut through the dorsal and ventral third of one, and through the middle portion of the next following segment.

This S-shaped curving and consequent overlapping of the protovertebral "plates" SS is of fundamental importance for our under-