

- V. "Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. IV. On a Large Humerus from the East Brak River, South Africa, indicating a New Order of Fossil Animals which was more nearly intermediate between Reptiles and Mammals than the Groups hitherto known." By H. G. SEELEY, F.R.S. Received April 5, 1888.

(Abstract.)

The late Mr. A. G. Bain sent to the British Museum a bone, No. 36,250, which the author regards as a right humerus. It is 32 cm. long. The crests at its proximal end are compared with those in the corresponding bone of *Saurischia*, *Ornithosaurs*, and *Anomodonts*; and they show a strong general resemblance to the crests seen in *Monotremes*, though their direction may be more reptilian. The distal end of the bone is entirely mammalian in plan. Its resemblances are about equally strong to *Edentata* and *Monotremata*, and there are evidences of more distant relationship with *Insectivora*, with certain *Marsupials*, seals, and other *Carnivora*. On the whole the evidence is insufficient to refer the fossil to the *Monotremata*. It is named *Propappus omocratus*. The author proposes to associate with it *Stereorachis* of Professor Gaudry, in an order named *Gennetotheria*. While the humerus of *Stereorachis* only differs from *Monotremes* in generic characters, and conforms in plan to the monotreme rather than the edentate type, the shoulder-girdle is intermediate between *Echidna* and the *Anomodont Keirognathus*, and the dentition resembles that of reptiles like *Lycosaurus* and other *Theriodonts*.

- VI. "Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. V. On Associated Bones of a Small *Anomodont Reptile (Keirognathus cordylus, Seeley)*, showing the Relative Dimensions of the Anterior Parts of the Skeleton, and Structure of the Fore-limb and Shoulder-girdle." By H. G. SEELEY, F.R.S. Received April 5, 1888.

(Abstract.)

This specimen was collected by Mr. Thomas Bain at Klip Fontein, Fraser's Berg, and registered in the British Museum as 49,413.

The head is described in detail, and except in the very small size of the teeth, shows no difference of importance from the skulls attributed to *Dicynodon*.

The shoulder-girdle is described and restored, and found to consist of interclavicle, clavicles, sternum, coracoids, pre-coracoids, and scapulæ. The scapula is in plan like *Kistecephalus*. The nearest approach to the coracoid and pre-coracoid is found among the monotreme mammals. The clavicle extended along the anterior margin of the scapula, and made an angular bend, so as probably to meet the interclavicle. The interclavicle appears to meet the lateral margins of the coracoids and not to overlap them in front. It approximates in form to the bone in *Ornithorhynchus*, *Ichthyosaurus*, and certain lizards, but is relatively much larger, and is larger than the interclavicle of *Stereorachis*. The sternum, which is transversely extended, is better compared with that of a lizard or Dinosaur. The shoulder-girdle as a whole is intermediate between monotreme mammals and known reptiles, but with the former type predominating.

The bones of the fore-limb are described in detail, and found to be relatively long and slender and generically unlike *Dicynodon*. The carpus is complicated. There are only two phalangeal bones in each digit, the second bone being a well-developed claw.

Finally a restoration is given of the aspect of the animal.

VII. "On the Modifications of the First and Second Visceral Arches, with especial Reference to the Homologies of the Auditory Ossicles." By HANS GADOW, Ph.D., M.A., Strickland Curator and Lecturer on Comparative Anatomy in the University of Cambridge. Communicated by Professor M. FOSTER, Sec. R.S. Received April 12, 1888.

(Abstract.)

The phylogenetic development of the first visceral arches shows us some most interesting changes of function, which we can follow upwards from the lower Selachians to the highest Mammals.

Originally entirely devoted to respiration as gill-bearing structures, the whole hyoidean arch becomes soon a factor in the alimentary system. Its proximal half forms the hinge of the masticatory apparatus, its distal half remains henceforth connected with the process of deglutition. Then this suspensorial arrangement is superseded by a new modification; the hyomandibula is set free and would disappear (it does nearly do so in Dipnoi and certain Urodela), unless it were made use of for a new function; with its having entered the service of the conduction of sound, it has entered upon a new departure, and it is saved from degeneration. The whole system of the one to four elements of the middle ear, which all have the same function as conductors of sound, is to be looked upon as *one* organ of *one* common