

FIG.

3. *Marssonopora dispersa* (Hagenow). A piece of a zoarium showing bilateral branching and consisting of two normal zoecia and the caudal ends of five others, three of which bear small avicularia. The lower normal zoecium (of which the capitular end only is shown) bears an ovicell. \times about 43 diameters. British Museum specimen No. D. 11498. Senonian, zone of *Belemnitella mucronata*. Rügen I., German Baltic.
4. *Dacryopora gutta*, n.sp. A piece of zoarium showing bilateral branching and consisting of two zoecia, encrusting a piece of shell of *Inoceramus lamarckii*, Parkinson. The caudal portion of one zoecium traverses a ridge in the shell and consequently appears wavy. \times about 33 diameters. British Museum specimen D. 27955. Senonian, top of zone of *Micraster cortestudinarium* or base of zone of *M. coranguinum*, Chatham, Kent. W. Gamble Coll.
5. *Dacryopora gutta*, n.sp. A single zoecium from the type-specimen \times about 37 diameters. British Museum specimen D. 27932. Senonian, zone of *Micraster cortestudinarium*. Pit west of large pit on Offham Hill, Lewes, Sussex. C. T. Gaster Coll.

III.—SAURISCHIA AND ORNITHISCHIA.

By Dr. F. HUENE.

IN 1888 the late Professor H. G. Seeley pointed out for the first time (Rep. Brit. Assoc. Adv. Sci., 1888, pp. 698–9) that Owens' order 'Dinosauria' should be divided into two great natural groups, especially on account of their pelvis. He called them Saurischia (= 'Theropoda' + 'Sauropoda') and Ornithischia (= 'Orthopoda'). He maintained his classification until his death in 1909, but nobody followed him. Only in 1907 did the present writer accept this classification and gave new evidences for it, but still was of opinion that these two groups only were ramifications of one natural unity, the 'Dinosauria'. But now, for several years, the writer has come to the conclusion that the 'Dinosauria' are not of monophyletic origin, but have developed from different points, and should therefore be considered as two distinct natural orders. Superficial similarities have been valued too highly, such as general form and size of the body, bipedal locomotion in two large groups, certain similarities in the formation of the foot, the femur, the humerus, and the shoulder-girdle.

The most striking difference between the Saurischia and the Ornithischia is in the pelvis, as is now generally well known. Even in their oldest known representatives there is no convergence at all in this respect. In the Ornithischia the facial part of the skull is prolonged and without præorbital openings, except in the most primitive forms with a very small fenestra; the dentition is multiplied and specialized; the extremities of the jaws are toothless (except in the primitive *Hypsilophodon*), and in the lower jaw (in one group also in the upper jaw) a new symphyseal bone has been formed; the præmaxilla is of enormous size, its posterior extremity being intercalated between maxilla and nasal, and even reaching the lacrymal or the adlacrymal; the internal bony nasal openings are of enormous size, and the formation of the rest of the palate is characteristic; the processus coronoideus in the lower jaw is high, the quadrate is free; and the supraorbital forms part of the roof of the skull (as

shown by the writer in the Stegosauria, the Trachodontidæ, and the Ceratopsia). All of these features in the skull are differences from the Saurischia and at the same time show the higher adaptation and specialization of the Ornithischia. So long ago as 1908 the writer stated that no Ornithischia are known in the same primitive stage as certain of the oldest Saurischia.

In the vertebral column Saurischia of the highest specialization do not possess ossified tendons as do all bipedal Ornithischia, even the relatively primitive *Hypsilophodon*. This must be due to a different manner of locomotion and of feeding; the different kind of motion must have the same reason as the transformation of the pelvis and its stronger fixation to the vertebral column. Moreover, abdominal ribs are not yet known in Ornithischia, but they occur in Saurischia even in some of their latest forms.

In a recent paper¹ the writer has tried to demonstrate that the Saurischia and the Ornithischia came from the Pseudosuchia,² the former from their most primitive representatives by minor specializations, the latter from more specialized Pseudosuchians by a stage of bipedal hopping creatures in which the pelvis became adapted to this new locomotion by retroversion of the pubis and development of a prepubis. From this stage, as the writer suggests, the birds were also adapted for climbing on trees, then becoming capable of a parachute-flight, in consequence of this acquiring feathers and then later learning true flight (Abel's ideas combined with the writer's).

The name 'Dinosauria' should be absolutely abandoned, as is the case, for instance, with that of 'Enaliosauria'.

In 1908 the writer showed that the Sauropoda must have developed from the Plateosauridæ, an opinion he still retains, although some minor changes in our knowledge of the Saurischia have taken place. The writer now proposes two great sub-orders within the Saurischia: Cœlurosauria and Pachypodosauria (see *Centr. bl. f. Min.*, etc., 1914, pp. 154-8), the former with four families: Hallopoda, Podokesauridæ (*Podokesaurus*, *Procompsognathus*, *Saltopus*, *Cœlophysis*, *Tanystrophæus*), Compsognathidæ, Cœluria (incl. *Ornithomimus*); the second sub-order would comprise again two lines of development, one leading from *Thecodontosaurus* to the Plateosauridæ and Sauropoda, the other from *Palæosaurus* to the Megalosauridæ.

IV.—ON A BORING AT MARSTON NEAR DEVIZES.

By A. J. JUKES-BROWNE, F.R.S., F.G.S. (deceased).

THIS boring, though confined to the Kimmeridge Clay, is of some interest, partly because it has proved the thickness of that clay to be much greater than it was supposed to be in this part of Wiltshire, and partly because it has yielded a species of *Aporrhais* or *Harpagodes* which has not previously been found in England.

¹ "Beiträge zur Geschichte der Archosaurier": Geol. u. Pal., Abb. 1914.

² Dr. G. A. Boulenger and Mr. D. M. S. Watson propose to reintroduce Owen's term 'Thecodontia', but the types on which he erected this order are: *Stagonolepis*, *Belodon*, *Cladyodon*, *Thecodontosaurus*, *Palæosaurus*, and *Bathygnathus*. They belong to very different orders.