Table II.

Observer.	Date.	Value for r in B.A. units.	Value of ohm in centimetres of mercury at 0°.
Lord Rayleigh and Mrs. Sidgwick	1883	0·95412	106·23
Mascart, Nerville, and Benoit	1884	0·95374	106·33
Strecker.....	1885	0·95334	..
L. Lorentz.....	1885	0·95388	105·93
Rowland.....	1887	0·95349	106·32
Kohlrausch	1888	0·95331	106·32
Glazebrook and Fitzpatrick.....	1888	0·95352	106·29

The paper contains a discussion of the above results. It is shown that probably Lord Rayleigh's value of r may be too high by as much as 0·0002, in consequence of the fact that the mercury in his terminal cups was 5° or 6° C., but no complete explanation of the differences between his result and those of Rowland, Kohlrausch, and ourselves, has been found. The difficulty of working with tubes such as those used by the Lorentz, 1—2 metres in length, and 1, 2, and 3 cm. in diameter, may perhaps account for his value for the ohm, viz., 105·93.

XI. "Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. VI. On the Anomodont Reptilia and their Allies." By H. G. SEELEY, F.R.S. Received June 20, 1888.

(Abstract.)

The author examines the structure of the skull in the Dicynodontia, and discusses the interpretations of its elements and affinities given by Sir Richard Owen, Professor Huxley, and Professor Cope, and arrives at the conclusion that the interpretation of the bones of the palate may be varied. The quadrate bone is found, though it is absent from many specimens owing to loose articulation, and the malleus is recognised as a normal element in the skull, which articulates with the quadrate and is free, except at its extremities. The palatine bones are internal to the pterygoids, and the pterygoids extend forward to the maxillary. The columella is found in more than one specimen. Many new specimens are described which further elucidate the structure of the skull. The first of these shows that the upper part of the foramen magnum is formed

by the supra-occipital bone, and that the element which has appeared to be a supra-occipital is the inter-parietal. Evidence is given of the form of the brain case, which is found to be high and narrow. Details are given of the structure of the squamosal bone, and of its relation to the quadrate and other cranial elements; and it appears that the squamosal usually embraces the quadrate, so as to extend in front of it, and sometimes to hide it, so that both the quadrate and squamosal sometimes contribute to form the articulation for the lower jaw. Evidence is offered of the sutures which divide the bones of the skull from each other. The sub-nasal element, found in *Pareiasaurus*, is met with in Dicynodonts, sometimes below the narine, and sometimes within its floor in the position of a turbinal. A new type of quadrate bone, which is regarded as Anomodont, is described, and found to differ from the usual form in being perforated in the antero-posterior direction. A summary of the structure of the skull is illustrated by a restoration showing its sutures.

Further contributions are made to a knowledge of the vertebral column. The cervical vertebræ are described, the atlas and axis are regarded as anchylosed, and succeeded by an intercentrum which has no neural arch. The cervical ribs are comparatively long, and articulate by a long fork with the neural arch, as well as with the centrum. Further evidence is given of the structure of dorsal vertebræ, showing that the rib is attached to a single transverse process of the neural arch. The caudal vertebræ of *Platypodosaurus*, eleven in number as preserved, are described; and some observations are made on the mode of ossification of the intervertebral substance. Additional materials further elucidate the Anomodont scapular arch, and examples of scapula and coracoid are described; but the only additional pelvic bone described is the pubis of *Titanosuchus*.

An account is given of the limb bones, which are elucidated by large bones associated with the skull fragments described by Sir R. Owen as *Titanosuchus ferox*. They contribute to a knowledge of the femur, humerus, and fibula in that type, and are associated with small bones of the extremities which are probably metacarpals. The ulna is described, which was referred by Sir R. Owen to *Pareiasaurus*, and evidence is given that it possessed terminal epiphyses of different form to any which are known in fossil reptiles, the proximal epiphysis having much the character of the olecranon of a mammal. A massive Anomodont tibia, also referred by Sir R. Owen to *Pareiasaurus*, is described, and found to possess a distal talon of mammalian pattern.

Further observations are made upon the Theriodontia, as restricted to the genus *Galesaurus*, the skull of which is further elucidated. The author also describes new material, making known the structure of the skull, palate, and scapular arch of *Procolophon*; from which it appears that the pre-coracoid is exceptionally well developed, and

united by suture to the coracoid. The inter-clavicle had the slender T-shaped form of the bone in *Ichthyosaurus*.

Procolophon has teeth on the vomera and pterygoid bones, and the structure of the palate and the post-orbital region show that the Procolophonia forms a distinct division of the Anomodontia. Observations are made on the relations of the European and South African Anomodonts, and on the relation of the Anomodontia to the Pelycosauria and to Cotylosauria. Comparison is made with *Placodus*, which genus has two exoccipital condyles, comparable to those of mammals, and appears to have lost the basi-occipital condyle. Comparisons are made with other extinct reptilia to show the relation of the Anomodonts to the Saurischia, and other reptilian types. Observations are offered on the theory of the Anomodont skull, and on the effect of the articulation of the lower jaw with the squamosal in causing a diminished growth of the malleus and quadrate, converting them into the malleus and tympanic.

The larger groups included in the Anomodont alliance are regarded as the Pareiasauria and Procolophonia; Dicynodontia, Gennetotheria, and Pelycosauria; the Theriodontia, Cotylosauria, and Placodontia are regarded as coming under the same sub-class, which at one end of the series exhibits characters which link reptiles with amphibians, and at the other end of the series link reptiles with mammals.

XII. "A new Form of Eudiometer." By WILLIAM MARCET, M.D., F.R.S. Received June 20, 1888.

[PLATE 14.]

The quantitative determination of oxygen, simple as it appears at first sight, is found in practice beset with many difficulties. Liebig's method with pyrogallic acid and potassium hydrate, though considered as yielding correct results, takes too much time, and is unsatisfactory in some respects, so that the eudiometer has become of general use for the estimation of oxygen. I shall not attempt to describe the various forms of eudiometer, but it may be assumed that Regnault, so well known for the care he bestowed on his investigations, had adopted a very correct kind of eudiometer in the researches he undertook with Reiset on the chemical phenomena of respiration.* Other eudiometers have been made since then, such as the ingenious instrument of Dr. Frankland for gas analysis, which has proved most serviceable. I claim for the present form of eudiometer that it is correct and reliable in its working, simple in construction, and easy of manipulation. The main objects of an eudiometer must be the easy introduction of the air to be analysed, the ready mixture of that air with a known volume of pure hydrogen gas, and the correct reading

* 'Annales de Chimie et de Physique,' 3rd Series, vol. 26, 1849.