

shafts, the texture of which had evidently been altered, probably by the long-continued and repeated concussions to which it had been exposed, for instead of breaking with the peculiar splintery fracture common to wood, it broke with a peculiar short fracture, and this, I am informed, is a common occurrence. In continuance of these experiments upon the effects of concussion or vibration, Mr. Lucas laid before the Section the results of some further experiments.

'On the Constitution of Matter,' by Sir G. GIBBES, M.D.—The principal point in the paper was, the formation of Heat by the union of the two fluids of electricity, which, with some other long exploded opinions, Sir G. Gibbes endeavoured to revive.

MONDAY.

SECTION C.—GEOLOGY AND PHYSICAL GEOGRAPHY.

Prof. EDWARD FORBES read a portion of the Report of the Dredging Committee.—[Reported in Section D.]

'On the discovery of a large specimen of *Plesiosaurus Macrocephalus*,' by Mr. CHARLESWORTH.—This specimen was found about three months previously in quarrying the shale at the Kettleness alum-works, a few miles north of Whitby, and, at the request of Mr. Charlesworth, the lessees of the works had allowed him to remove it to the museum of the Yorkshire Philosophical Society, with a view to its exhibition at the meeting of the Association.

'On the discovery by Mr. Wood of an Alligator associated with new genera of Mammalia, in the freshwater cliffs at Hordwell, Hants.'—Mr. Wood, on quitting England had intrusted to Mr. Charlesworth, for publication, a paper on the eocene freshwater formations at Hordwell, including notices of many new fossils which he had discovered in that locality. The most important of these was an alligator; of this a great portion of the head and many bones of the skeleton were obtained.

Mr. MURCHISON read part of a communication from Prof. Loven, on the Bathymetrical Distribution of Marine Animals in the Scandinavian Seas. [Reported in Section D.]

Report on the Fossil Fishes of the London Clay, by M. AGASSIZ.—The group of fish peculiar to the London clay, whose remains are particularly abundant in the Isle of Sheppy, do not exhibit those strange forms which distinguish most of the fish of the more ancient formation; but everything reminds us of the fish living in the present seas. The examination of these remains is attended, however, with difficulty, on account of the state in which the specimens are found, imbedded in hard clay, which has replaced the soft parts of the fish, and as they belong chiefly to the cycloid and ctenoid orders, with soft scales, which are generally of small size, and easily detached and broken, the crania are the only portions usually preserved entire. In the classes of reptiles or mammalia the peculiarities presented by the cranium points out with certainty the relations of the animal to which it belonged; but nothing is so variable as the shape of the bones which make up the skeleton of a fish's head, and the multitude of processes and depressions serving for the attachment of muscles, gives to this part such a diversity that the ichthyologist must often despair of being able to refer these fossil crania to their proper types; especially as they are often incomplete, wanting the jaws, the bones of the face, and the opercular and branchial apparatus, leaving only the bony inclosure of the brain. The author gives a detailed anatomical description of the various families. He then institutes a comparison between the species found at Sheppy and those now existing on the English coast, and concludes, that although their general character is somewhat different, yet their distribution has taken place according to the same laws. The forty-four species of fish, whose osseous remains are found at Sheppy, are referred to thirty-seven genera, nearly all of them unknown in the present seas; and, excepting the gadoids, or cod tribe, their recent representatives are mostly confined to southern seas. The important evidence to be derived from a comparison of the scales of these species with those of existing fish, remains to be obtained, and is attended with difficulty, as it requires the aid of the microscope.

'On gigantic extinct Mammalia in Australia,' by Prof. OWEN.—The author observes that the first information respecting the extinct Fauna of Australia was derived from Major Mitchell's researches in the ossiferous caves of Wellington Valley. All the remains there discovered, with one exception, indicated the existence of only marsupial animals, of extinct species, differing chiefly in being larger than any now living. The specimen, which thus differed from the rest, was the fragment of a lower jaw, with molar teeth and the socket of a single incisor; it most nearly resembled the wombat, and had been named *Diprotodon* by Mr. Owen. Since that period (1835), Sir Thomas Mitchell, Count Strelitzky, and other gentlemen, have obtained collections of bones from caves on the Darling Downs, west of Morton Bay, and other localities at a distance from Wellington Valley. From an examination of these, Mr. Owen has determined the former existence in Australia of a Mastodon, nearly allied to the *M. angustidens*, remains of which are so abundant in Europe, and also allied to the *M. Andium* of North and South America; and he observes that the fact of the wide distribution of remains of the Mastodon in Europe, Asia, and America, prepared him to receive with less surprise the unequivocal evidence of its existence in Australia also. Mr. Owen then proceeded to the consideration of the fossil remains of the Marsupialia, a class of animals to which, with the exception of small Rodentia, such as rats and mice, all the indigenous quadrupeds of Australia belonged. With regard to the *Diprotodon* before mentioned, much additional evidence had been required to establish the marsupial character of a quadruped as large as a rhinoceros; and amongst the remains lately obtained in the bed of the Condamine river, at Morton Bay, was a specimen consisting of the anterior part of the lower jaw, with the base of a tusk, and a portion of the molar teeth, the tusk being identical with one from Wellington Valley. This specimen shows that the animal possessed large incisive tusks, combined with molar teeth like those of the kangaroo, characterized by two transverse ridges; the marsupial character of these remains was also indicated by the bending in of the angle of the jaw. Mr. Owen referred to a second gigantic type of extinct marsupials; but observed that further evidence relative to the marsupial character of these great quadrupeds was most desirable. From examination he concluded that the great extinct herbivorous marsupials did not exhibit the peculiar disproportion of the extremities characteristic of the kangaroos, but were possessed of legs of nearly equal length, like the wombat. The species of marsupial already known to inhabit Australia form, as Cuvier observed, a small chain of animals, representing the quadrupeds of America and Europe, which was now rendered more complete by the discovery of extinct genera representing the Pachydermata, and equal to the medium bulk those animals now attain.

Mr. STRICKLAND read a portion of his Report on the state of our knowledge of Ornithology. [Reported in Section D.]

'On an anomalous Structure in the Paddle of a species of *Ichthyosaurus*,' by Mr. H. E. STRICKLAND.—The specimens exhibited were the right and left humerus, with the next joints, corresponding to the fore-arm, attached, but in each this part consisted of three bones, nearly equal in size, instead of two. They were from the lias in Warwickshire.

SECTION D.—ZOOLOGY AND BOTANY.

Mr. H. STRICKLAND read a Report on the recent progress and present state of Ornithology.

'A Monograph of the Sub-family Odontophorinae or Partridges of America,' by J. GOULD.—The subjects of the present monograph were interesting from their probable utility whenever the countries of which they are denizens shall come under the dominion of civilization, as well as for naturalization in Europe; many of the species, being sufficiently hardy to brave the severities of our winters, are likely to thrive in situations suitable to the partridge and quail. All the members of the group are strictly American, and by far the greater number of the species natives of that portion lying between the 30th degree of north latitude and the equator. Four species are included in the Fauna of North America

and it would be these in particular that Mr. Gould would suggest as the species most likely to thrive in Europe. He next proceeded to state that thirty species of this group were now known to him, two only of which were included in the works of Linnaeus, and nine in the 'General History of Birds,' published by Latham in 1823. And even in the late revision of the subject in the illustrations of Ornithology, the number of species were only increased to eleven. Vieillot was the first who conceived the propriety of separating one of the members of the present group from the old genera Tetrao and Perdix, proposing the term *Odontophorus* for the *Tetrao guianensis* of Gmelin; subsequently Stephens and Wagler had proposed a further subdivision of the group, the former proposing the term *Ortyx* for Virginian partridge, the well known *Perdix Virginiana*, and the latter that of *Callipepla*, the type of which is the *Ortyx squamata* of Vigors. If it were admitted that the American partridges constituted more than one genus, the genera must not be confined to three or four, but must extend at least to six. In concluding, Mr. Gould remarked that the partridges of America constitute a well defined family, distinguishable from the grouse and partridges of the old world in many particulars, among which may be intimated the total absence of any spur or spur-like appendage on the tarsi, and by the possession of teeth-like processes on the edges of the under mandible. The subject was illustrated with drawings of most of the species.

Report 'On the Birds of Yorkshire,' prepared by T. ALLIS.—The Report added the following to the before recorded birds of Yorkshire. The Golden Oriole, a fine female specimen, shot near the Sperm Lighthouse in 1834; Fire-crested Wren, shot at Wood End, near Thirsk; Branded Titmouse, from the neighbourhood of Huddersfield; Black Redstart, several specimens of which were taken by a bird-catcher near Leeds; the Stock Dove, killed near York, and occurring not unfrequently near Sheffield; it has also been seen in Feversham Park; Little Bittern, shot at Birdsall, near Malton; Polish Swan, killed near Bridlington; Gull-billed Tern, taken alive near Leeds; and the Ivory Gull, shot some years ago off Scarborough by a gentleman resident in York. The Report was remarkable for the number and variety of marine birds reported to occur about Huddersfield and Barnsley, apparently in a state of transition from the east to the west seas; as also for recording the best instances of the occurrence of that noble bird the Great Bustard, which has now been extinct about twenty years in the county of York; it also notices the great diminution of numbers of many species formerly plentiful, and which, in the course of a few more years, will also probably be numbered with the extinct; and has added numerous individuals to those already recorded of many of the rarer species; also a list of the time of arrival of many of our summer visitors, from the pen of John Hepenstall, of Sheffield, and a register of the arrival and departure of the swallow tribe, from the pen of W. Gett, Esq., of Leeds; the number of Yorkshire species appears to be 25.

'On the Anatomy of *Acteon viridis*,' by Prof. ALLMAN.—The author controverted the assertions of M. de Quatrefages relative to numerous points in the anatomy of this little mollusc, and to the position assigned to it by the French naturalist in his new order Phlebenterata.

Prof. ALLMAN brought before the Section a Helianthoid zoophyte, which he had just discovered at Cruick Haven, upon the southern coast of the county of Cork, and which must probably constitute a new genus. The zoophyte is one of extreme beauty, and constitutes a connecting link between Achnia and Lucernaria, being distinguished from the former by its capitate tentacula, and from the latter by their arrangement in two uninterrupted series.

'On the structure of the Lucernariae,' by Prof. ALLMAN.—In this communication certain undescribed peculiarities in the anatomy of these zoophytes were laid before the Section; and the existence in the tentacula and other superficial parts of the animal, of organs analogous to the darts of Hydras, and to the spiral bodies of the Helianthoid zoophyte, already described, was demonstrated.

Prof. D. Fournier remarked on the importance of