

After this description of the teeth, the form, proportions, disposition and connections of the different bones of the cranium are pointed out; and the structure of the osseous cavities subservient to the organ of sense is adverted to, and deductions as to the aquatic habits of the *Toxodon* are founded on these observations.

So far as regards the form and position of the external aperture of the bony nostrils, and of the occipital condyles, and the slope of the plane of the occipital region of the skull, the same arguments might be advanced for referring the *Toxodon* to the mammiferous group containing the Dugong, as have been recently urged in reference to the *Deinotherium*, but the existence of air-cells or sinuses in the superior parietes of the cranium in the *Toxodon*, show that the cranial characters above alluded to, are not conclusive as to the cetaceous nature of an extinct mammal.

The general conclusions respecting the affinities which the *Toxodon* bears to existing orders of mammalia, so far as opinions can be formed from the portion of the skeleton preserved, are summed up by the author as follows:

So far as dental characters have weight, the *Toxodon* must be referred to the rodent order; but from this order it deviates in the relative position of the supernumerary incisors, and in the number and direction of the curvature of the molars.

It again deviates in the transverse direction of the joint of the lower jaw, and in the relative position of the glenoid cavities and zygomatic arches. In the aspect of the plane of the occipital foramen, and occipital region of the skull, in the form and position of the occipital condyles,—the aspect of the plane of the bony aperture of the nostrils, and in the thickness and texture of the osseous parietes of the skull, the *Toxodon* deviates both from the *Rodentia* and existing *Pachydermata*, and manifests an affinity to the *Dinotherium* and the *Cetaceous* order.

The author observes, however, that the development of the nasal cavity and the presence of frontal sinuses, render it extremely improbable that the habits of the *Toxodon* were so exclusively aquatic as would result from the total absence of hinder extremities, and concludes, therefore, that it is a quadruped, and not a Cetacean; and that it manifests an additional step in the gradation of mammiferous forms leading from the *Rodentia*, through the *Pachydermata* to the *Cetacea*; a gradation of which the water-hog of South America (*Hydrocharus Capybara*) already indicates the commencement amongst existing *Rodentia*, of which order it is interesting to observe this species is the largest, while at the same time it is peculiar to the continent in which the remains of the gigantic *Toxodon* were discovered.

May 3.—The Rev. Baden Powell, A.M., F.R.S., Savilian Professor of Geometry in the University of Oxford, was elected a Fellow of this Society.

A paper was first read, entitled "A Sketch of the Deposits contain-

ing extinct Mammalia in the neighbourhood of the Plata;" by Charles Darwin, Esq., F.G.S.

Mr. Darwin premised his account of the geological features of the district in which the remains of the *Toxodon*, described at the meeting on the 19th of April by Mr. Owen, (p. 541) were found, by remarking that as the other mammalia and the fossil shells had not yet been accurately examined, the notice was necessarily imperfect.

To the westward and southward of the great estuary of La Plata, extend those level and almost boundless plains which are known by the name of the Pampas. Their geological constitution over many hundred square miles does not vary. It consists of a reddish argillaceous earth, which generally contains irregular concretions of a white aluminous limestone, or indurated marl, often passing irregularly into a compact calcareous stone, traversed by small linear cavities, similar to those which occur in many of the freshwater limestones of Europe. In the province of Entre Rios, the formation which composes the surface of the Pampas overlies and passes into a series of beds of sand, clay, and crystalline cellular limestone; containing sharks' teeth, gigantic oysters, and other shells belonging to the genera *arca*, *Venus* and *pecten*. *These shells, with the exception of the oyster, have a general resemblance to existing species. To the northward and eastward of the Plata, the province of Banda Oriental, though very low and level, consists of gneiss, granite and primary slate. These rocks are generally concealed by a considerable thickness of a reddish earth, which, though at first sight like ordinary detritus, belongs to the same formation with that composing the Pampas. This deposit, extending over so wide an area on both sides of the Plata, abounds with very numerous remains of various extinct mammalia; among which the *Toxodon*, *Megatherium*, *Mastodon*, an animal covered with an armadillo-like case, and as Mr. Darwin believes, the horse, co-existed in the same district.

Proofs of the elevation of the land within a recent period, occur in several parts. Mr. Darwin stated that he had seen in the possession of Sir W. Parish, marine shells which occur near Buenos Ayres in great beds, elevated several yards above the level of the river; and these same species the author had found living on the mud banks on another part of the coast. He, therefore, inferred, that at no very remote period a great bay occupied the area both of the Pampas and of the lower parts of Banda Oriental; and that into this bay the several rivers, which now unite to form the Plata, poured down reddish sediment, resulting, as at the present day, from the decomposition of the granites of Brazil, and charged with carbonate and sulphate of lime, perhaps derived from the Cordillera. On the cliff-formed shores of Entre Rios, the line can be distinguished where the estuary mud first encroached on the deposits of the ocean. The author also supposed that the ancient rivers, like those of the present day, carried down the carcasses of land animals, which thus became entombed in the accumulating sediment. Since that period, by the gradual rising of the land, the bottom of the great bay has been converted into plains, almost as level as the surface of the former sea; and the

rivers now hollowing out courses for themselves, have exposed, in many places, the skeletons of those ancient inhabitants of the neighbouring land.

Mr. Darwin then briefly alluded to a small formation of mud and shingle at Bahia Blanca, some hundred miles south of the Plata, in which the remains of several extinct quadrupeds have been discovered. Amongst these he enumerated the *Megatherium Cuvieri*, the remains perhaps of a smaller species of *Megatherium*; a quadruped closely allied to the armadilloes, but nearly as large as a horse; some small rodents, and other animals. These remains are embedded with one species of terrestrial, and several of marine shells, the latter being identical with some existing in the adjoining bay. It is, therefore, certain that the greater number of the above mammalia found at Bahia Blanca lived within a very recent epoch; and from the position of the bed in which they occur, it is equally certain that the form of the land has undergone, since that period, very little change, even of level, with respect to the ocean.

Several hundred miles further southward, Mr. Darwin found the remains of an animal which Mr. Owen says has an affinity with the Llama or Guanaco, but was of a gigantic size: this animal likewise existed since the Atlantic has been peopled by the shells now living.

The author observed in conclusion, that the comparative recentness of the epoch at which the fossil mammalia lived, is shown, first by the shells associated with them; secondly, by the recent tertiary character of the strata underlying the deposit containing those remains; and thirdly, from the little altitude of such beds above the level of the sea; for in this country, according to the author's observations, the movements seem to have been so regular, that the amount of elevation becomes a measure of time.

These facts relating to the former existence of the inhabitants of a part of the globe so remote from Europe, fully confirm the remarkable law, often insisted upon by Mr. Lyell, that "the longevity of the species" among mammalia has been of shorter duration than among molluscs. The author finally remarked, that although several gigantic land animals, which formerly swarmed in South America, have perished, yet that they are now represented by animals, confined to that country; and though of diminutive size, possess the peculiar anatomical structure of their great extinct prototypes.

An extract of a letter, dated Saharumpore, 18th November, 1836, from Captain Cautley to Dr. Royle, was next read; permitting the announcement of a fact which had long been communicated to the latter, of the finding of the remains of a quadrumanous animal in the Sewaliks, or Sub-Himalayan range of mountains. An astralagus was first found, but latterly a nearly perfect head, with one side of the molars and one orbit nearly complete. The animal must have been much larger than any existing monkey, and allied to Cuvier's Cynocephaline group. Captain C. also announced the discovery by Major Colvin of a specimen of the head of the Sivatherium, in which, in conformity to the conjectures of Dr. Falconer and himself, in their