

posed the term "Epi-Silurian" for these formations, which, he observed, could not be called "old red sandstone" in Devon, or "Devonian" in Herefordshire.

Prof. PHILLIPS first discussed the general nature of the problem involved in determining the age of the Devonian strata, and compared them with other systems of strata whose relative position had been fully made out,—showing that, both by mineral character and structure, and sequence of individual rocks, the strata of Devonshire could be confidently ranged among the older assemblages of rocks, but were not referable to their exact age, or place in the general scale of geological time, by characters derived from these considerations. Mr. Phillips next proceeded to examine the value of zoological evidence. Seeing that as the fossils of any series of strata were found in deposits, which have in succession formed the bed of the ancient sea, and are therefore to be received as the monuments of successive combinations of life, the question arose, what was the character of organic life in each of these periods? These remains of life are most plentiful in the upper strata, decrease in number and variety as we proceed downwards, and, by gradual and continual diminution, approach in the lowest to absolute extinction. In the Devonian rocks more than 300 forms are now known; and from the abundance of materials not yet examined we may expect to raise it to 500, a number greater than that yet found in the Silurian system. Turning from the consideration of numbers to another mode of comparison, we may study the prevalent forms of organic life, characteristic of successive periods. Nature is always consistent in the inorganic and living parts of creation, and the combination of organic remains was not the same when the earth was under different conditions from the present. The predominant mollusca of the ancient sea were not of the same type as the present. The Cephalopoda and Brachiopoda, now comparatively rare, were abundant and various in the ancient beds; but Polyparia abound in all strata where the necessary conditions seem to have existed. Having ascertained the combinations which characterize groups of the older strata, the general result of a comparison between the Devonian rocks and the Silurian and carboniferous systems would give them an intermediate position between the combination of life in the Silurian period and that in the carboniferous; and Mr. Phillips considered the evidence derived from this ground as free from imperfection as any which could be obtained. He next considered the value of particular species in characterizing formations, and observed that in one country a species might spread all over a deposit, but never rise to those above, or have existed in those below; in another country it might range through twenty consecutive beds; no reliance can therefore be placed upon a single case, such as the occurrence of a coral in both the Silurian and Devonian systems. It has been said that not one carboniferous fossil occurs in the Silurian system, nor one Silurian fossil in the carboniferous; but in Devonian strata fossils of both these formations occur mixed, so that it appears that some Silurian fossils continued to exist till after the commencement of the Devonian series, and some of the carboniferous fossils began to exist earlier than its close; and in districts far removed some species of both formations may have commenced their existence at the same point of time. The Polyparia of the Devonian and Cornish strata resemble those of the Silurian; and the Crinoidea and many Brachiopoda resemble those of the carboniferous system; whilst some forms manifest no analogy to either. Again, there are features in the combination of organic remains peculiar to certain districts. The organic remains so abundant at Petherwin, strongly and specially resemble those of the Fichtelgebirge, described by Count Münster. The fossils of North Devon and Cornwall often resemble those of the carboniferous limestone, whilst the South Devon corals resemble those of the Silurian system. The fossils of North and South Devon differ considerably, and the circumstances under which they existed seem to have differed. The fossils of South Devon seem principally analogous to those of the lower beds of North Devon, especially the corals; but from the very nature of coral reefs some species of coral might be prolonged under particular circumstances through long periods of time.

With respect to the arrangement of the ancient fossiliferous strata in one grand series, Mr. Phillips was not of opinion that all the terms have yet been obtained. When Mr. Murchison introduced his system of 400 new forms of fossils, the sequence was still incomplete; and now that another system had been introduced, with a probability of 500 more species, there might yet be on the continent more than one series of beds of which we have here no representatives. The Devon and Cornish strata may be one such series, not representing a whole geological interval; still less can it be said to be an exact equivalent of the old red sandstone, which is but a local interruption in the sequence of zoological affinities; and in examining the changes which have taken place upon the globe at large, we may find evidences of many such partial interruptions. Prof. Phillips concluded by recommending the study of stratified rocks, as the individual effects of one great series of changes which had gone on in regular sequence from the first appearance of organic life to the time when existing species first appeared in the tertiary deposits, and through the tertiary to existing conditions, and proposed to group the whole under three great classes, by the names of Palæozoic, Mesozoic, and Cainozoic deposits, a classification depending wholly on general views of the associations of organic life, and yet really capable of being harmoniously compared with mineral characters taken on a large scale, and with a simple series of successively superposed strata, such as that formerly proposed by Mr. Conybeare.

Since the publication of the Report of Prof. Phillips's paper 'On Fossil Crustaceans, &c.' (ante, p. 599), we have received the following note:—

Clifton, Bristol, 18th Aug. 1841.

Perhaps it may be interesting to your readers to know, that the little Cypridiform Entomostraca, from the lower limestone shales of Pembrokeshire, to which I called the attention of the Geological Section of the British Association at Plymouth, have a wider geographical range than I then presumed to indicate. I have had the pleasure, to-day, of recognizing them, very distinctly, in the same geological place, below the great mass of mountain limestone, and above the old red sandstone, on the bank of the Avon, about one mile west of the Hotwells.

Yours, &c.,
JOHN PHILLIPS.

SECTION D.—ZOOLOGY AND BOTANY.

Prof. OWEN gave an account of a Thylacinus, the great dog-headed opossum, and one of the rarest and largest of the marsupiate family of animals. At the present day it existed only in Van Diemen's Land, though formerly it had a much more extensive geographical distribution. For his knowledge of the anatomy of this animal Mr. Owen stated that he was indebted to Sir John Franklin, who had kindly preserved and sent him a specimen in spirit, and he believed this was the only specimen extant in Europe. In its habits it was carnivorous; holding about the same relation to the other marsupiate that the carnivora did to the whole of the mammalia. It was a great pest to the shepherd in its native districts; and in its low intellectual character, and its craft and cunning, very much resembled the wolf. In destroying sheep, it does not feed on them at once, but proceeds to worry, if possible, the whole flock, first tearing one and then another. Its smell is very powerful. It has a narrow head, a large number of incisor teeth, with the molars all alike. Its bony palate is very defective, thus presenting a lower organization than any of the carnivora of Europe. Its internal organization agrees with that of Dasyurus. Its external organization presents nothing remarkable. It has the pouch so remarkably characteristic of the whole order of these animals. The reason of the existence of this pouch might be to enable the animal to carry its young great distances more easily, as it was obliged to travel far in seasons of drought in search of water. Both male and female possess this pouch in the whole family, in the former less evident. In Thylacinus the pouch is more developed in the male than any other genus.

Mr. J. C. BELLAMY made remarks 'On the Distribution, &c. of the Mammals of Devonshire'; he exhibited a drawing of the palate of an individual of *Balænoptera minor* (Knox), taken off Plymouth, and showed a portion of the baleine, and a part of the ear of that animal. He showed a new species of Vole, taken at Yealmpton. He also displayed a tooth of an extinct species of elephant, from the Yealm

Bridge cavern; a species of *Asterias* unknown to him; a species of *Helix* new to the British isles; some *Helices* from the Yealm Bridge cave (proving their modern date); the skull of *Arvicola agrestis*, having teeth with fangs, instead of the common fluted condition; and several curious reliques of arvicolæ, birds, fish, &c. from the cavern of Yealm Bridge, which he discovered.

Dr. RICHARDSON stated, that the new *Helix* described by Mr. Bellamy, under the name of *H. subvirescens*, had been seen by Mr. Gray, who found it to be the *Helix rivulata* of the continent. It had been found by Mr. Forbes in the Isle of Man, and also described by Turton.—Mr. COUCH observed, with regard to the white varieties of animals, he did not believe it depended, as frequently supposed, on cold. He knew in Cornwall a district in which a white variety of hares existed, and had propagated their race. The various species of Cetacea were not uncommon on the coast of Cornwall. He had seen some fifty or sixty feet long, and had often watched their actions by means of a telescope. The *Asterias* produced by Mr. Bellamy was new to him.—Mr. BALL believed the *Asterias* was described in Mr. Forbes's 'History of British Star-fishes.'—Col. SMITH related an instance of a number of specimens of the *Lepus Americanus* being shipped in America quite white, and at the end of twenty days they had turned quite brown. The hairs were not shed, and the change must have taken place in the hairs themselves.—Dr. LANKESTER observed, that unless more specimens of the *Mus intermedius* and *Arvicola hirta* could be procured, it would be very unsafe to admit them into the list of new British animals. A variety of circumstances might occur, producing the amount of difference which these specimens appeared to present.

Mr. P. F. BELLAMY read a paper descriptive of two Peruvian Mummies presented to the Devon and Cornwall Natural History Society by Capt. Blanckley, of the Royal Navy.—They proved to be the remains of children of different ages, one a few months old, the other not much more than one year; they were brought from the mountainous district of Peru, but at a considerable distance from the lake Titicaca. In conjunction with them were found certain envelopes (one of which proved to be an article of dress,) and the model of a raft or catamaran, two small bags containing ears of an undescribed variety of Indian corn, and two small earthen pots. He also exhibited a variety of other models found wrapped up with others examined by Capt. Blanckley. The skulls were found to resemble those adult specimens contained in the Museum of the Royal College of Surgeons in London, and presented the same peculiarities, viz. a short projecting face, square protruding chin, receding forehead, and elongated cranium. He stated, that he considered their formation to be natural, for the following reasons: 1st, that the peculiarities are as great in the child as in the adult, and indeed, more remarkable in the younger individual than in the elder; 2nd, from the great relative length of the large bones of the skull, all of which are elongated in a posterior direction; 3rd, from the position of the occipital bone, which occupies a place in the under part of the cranium; 4th, from the absence of marks of pressure, there being no elevation of the vertex nor projection on either side; and 5th, from there being no instrument, nor mechanical contrivance, suited for the process of compression, found with the remains. He called attention to the peculiar formation of the occipital bone, which consisted of five rudimentary portions; the fifth piece being placed between the occipital portion, commonly so called, and the two parietal bones. He considered the probability of the mummies being the remains of some of the true Titicacan race, deposited after the arrival of the original emigrants, who founded the Incas dynasty, and called on ethnologists to say what Asiatic people they resembled in manners, customs, and attainments; but if no affinity could be found, he considered it fair to attribute to the indigenous a mental capacity equal to the originating of such inventions, as the specimens connected with these mummies would indicate them to have been capable of. The extinction of the race he considered to have been gradual, and occasioned by an intermixture of blood with the followers of Manco Capac. Lastly, he suggested that the adult skulls called Titicacans were of two kinds, one being of the pure stock, the other of a spurious character, resulting from the