

Pedum *coxæ* corpore fusæ. *Pleopoda* posteriora tria duplicatis partibus divisa. *Telson* cylindraceum.

*Macrocephalus longirostris*, n. s.

*M. cephalo* perlonge rostrato (rostro corporis totius  $\frac{2}{3}$  longitudinem æquante). *Antennis* superioribus rudimentariis. *Gnathopodis* primi et secundi parium chelatis. *Carpis* dactylorum apice productis.

Presented by Sir E. Belcher.

PLEUSTES, n. g.

*Cephalon* rostro productum. *Antennæ* superiores quam inferiores longiores. *Coxæ* anteriores quatuor permagnæ. *Gnathopoda* subæqualia et subcheliformia. *Pleopoda* posteriora in duplicatis partibus divisa. *Telson* squamiforme.

*Pleustes tuberculata*, n. s.

*P. pereii* segmentis omnibus, *plei* anterioribus duobus tuberculo dorsali medio ornatis. *Pereii* segmentis posterioribus tribus, *plei* omnibus lateraliter tuberculatis. Segmentis *pereii* omnibus, *plei* anterioribus duobus coxarum marginibus tuberculatis. *Pereiopodis* posterioribus tribus *coxis* tuberculatis. *Pleopodis* posterioribus appendice interiore permagno.

*Amphitoë lacertosa*, n. s.

Ut genus sed *gnathopodo* secundo permagno et chelato.

Arctic regions.

*Lysianassa bidenticulata*, n. s.

*L. annis* inferioribus superiores non superantibus. *Gnathopodis* paris primi *propodo* *carpo* longiore. *Gnathopodis* paris secundi *carpo* *propodo* longiore. *Plei* segmento tertio margine posteriori denticulis duobus utrinque producto.

BIBLIOGRAPHICAL NOTICES.

*The Ground beneath us : its Geological Phases and Changes.* By J. PRESTWICH, F.R.S. &c. London : J. Van Voorst. 1857.

THE geological researches of Mr. Prestwich and their results have been long well known and fully appreciated. Many years has he devoted to the elucidation of the history of the Tertiary deposits of this country ; nor have his investigations been in vain, or unproductive of useful consequences ; for his researches, independently of their scientific bearings, have been also of a practical kind, as is evinced in the publication of his useful work, 'The Water-bearing Strata of the Country around London\*,' a notice of which appeared in a previous Number of this Journal.

\* Van Voorst, 1851.



The history of the Tertiary strata must always be invested with some interest, as it was the examination of these deposits around Paris (at the commencement of the present century) that developed some of the germs of true geology, and also called forth the genius of "Cuvier, the great founder of that department of the science of organic remains which relates to the interpretation of the fossil bones and teeth of the vertebrated animals," — whose researches and descriptions were so marvellous, as he successively restored and determined the analogies of that vertebrate fauna which flourished around the margins of the earlier Eocene estuary. Conjointly with his colleague, Brongniart, Cuvier produced a scheme of classification of these French Tertiary strata—strata which, from the researches of Deshayes and others, have yielded an invertebrate fauna richer than that belonging to the British seas, and even exceeding that living at present in the Mediterranean. Parkinson, Webster, and Buckland, in this country, early attempted to synchronize the British deposits with the French classification, which, although generally correct, required some modification; and the true correlation of the two series was subsequently elaborated and defined by Mr. Prestwich. Nor must we overlook the fact, that, when the Molluscan fauna of the British Eocene area is fully worked out, as is now being effected most carefully and thoroughly by Mr. F. Edwards, it will also yield as rich and remarkable a series of Testacea as the foreign equivalent strata.

The metropolis stands upon gravel, which is underlaid by an important member of the Tertiary series, to which it gives its name,—is surrounded by other strata of equal interest,—and yet no popular guide-book has appeared to direct the inquirer or the geological student in his investigations around London. The only special paper (with the exception, of course, of the subsequent general memoirs by Mr. Prestwich) was that published by Parkinson in 1811, 'Observations of some of the Strata in the Neighbourhood of London\*.' We may here notice, however, an Appendix to a 'Hand-book for London,' published some years since†, in which the chief geological features of the district are correctly noticed. A guide-book has been a want, as many people have long felt; and this, Mr. Prestwich has to some extent, but not fully, supplied. It is, however, using a term of the author, a "basement-bed" upon which he may hereafter raise another superstructure, and render it more serviceable by appending a list of localities, fossils, &c., after the manner of a special paper on the London Clay, published by him in a late *Journal of the Geological Society*‡. Still, small as it is, it contains much that is useful and suggestive, and is a valuable and acceptable addition to geological literature.

This little book contains the substance of three Lectures 'On the Ground beneath us,' delivered to the members of the Clapham Athenæum. It was our good fortune to be present at the delivery

\* *Geol. Trans.* 1 ser. vol. i. p. 324.

† Weale, Holborn.

‡ *Geol. Journ.* vol. x. p. 401.



of these lectures; and we think that the Council of that Institution have acted wisely and conferred a benefit in requesting the author to embody them in a more permanent form. In this manner we are enabled to consult at our leisure the details of those well-explained conclusions, to which we, as well as others doubtless, listened with so much pleasure.

Although apparently confined to the 'Geology of Clapham,' this work really takes a wider range, and describes the nature and character of those geological changes which have taken place in the vicinity of London, embodying at the same time the principal results arrived at by geologists, and a statement of the mode by which the several problems have been worked out. These lectures are divested as far as possible of all technicalities; explanatory notes and references, as well as small but useful illustrations, are given, so as to render the description of the records of the successive physical phenomena which are preserved in the ground beneath us, intelligible to the ordinary reader.

The first lecture is devoted to one of the later, if not the latest period of the earth's history,—the accumulation of the superficial gravel and its associated beds: no geological subject is of more difficult inquiry, few perhaps so interesting. Most of our readers who have examined the excavations for sewage, building, or for the material itself\*, are aware that in and around London there is a vast accumulation of gravel, which gravel varies from 3 to 20 feet or more in thickness. The origin of this gravel, the direction from which it has come, the agency by which it has been brought, the period at which it was distributed, and the fact of its being the great source of water-supply to all the shallow wells and land-springs in the district,—are points fully and succinctly treated.

The main bulk of the gravel of London has been derived from the black flints which occurred in the surrounding chalk districts; but this destruction of the chalk must have been very considerable, for it is inferred by the author that it would require a mass of chalk 200 or 300 feet thick to form a bed of flint-gravel 10 feet thick. With the flint-gravel occur cretaceous sandstones, and also, but more rarely, pebbles of quartz, porphyry, and slate, which must have been transported from some distance, as from Wales and the border counties. Mr. Prestwich treats of the possible modes of transport, inferring, with other geologists, that the surface now covered by gravel was under water at the time, and that the distribution might have been effected either by the transient action of a body of water,—or by the action of a large river flowing into the Thames valley,—or by the ordinary power of sea-currents,—or by the agency of coast-ice and icebergs. One fact appears evident, that the surface of the

\* The value of this gravel, and its general use for road- or pathways, is well known, and even also as a material for exportation. Some years since, a large quantity was exported from Bayswater to Russia, realizing a considerable sum; and hence, we believe, the origin of local names of buildings and places in that neighbourhood.



district has been considerably modified since certain portions of the gravel were spread over it.

In speaking of the geological position of the gravel, Mr. Prestwich enters into some interesting details respecting the characters and habits of the Mammalia and Testacea belonging to this period, and points out the known, but singular and suggestive fact, that whereas the larger number of the species of the great Mammalia have become extinct, a large proportion of the friable and delicate shells which then frequented the land and rivers of the same countries which the mammals inhabited, have lived through the various geological changes which have since succeeded.

The second lecture describes the structure, age, and organic remains of the London Clay. Although immediately underlying the gravel, yet the two deposits are separated by a wide interval (geologically speaking)—an interval during which numerous marine and estuarine strata were deposited, both in this country and on the continent, and even the mighty Alps attained some, if not the entire portion of their elevation. The London Clay is treated of in regard to its height and extent,—its superposition and relative age,—the description of the character and affinities of the animals and plants which flourished during the period at which the formation was accumulated,—the thickness of the strata, and the number and extent of the successive zones of animal life,—the mineral character and structure of the mass,—and the arrangement of the sediment; “so as to form some opinion as to the probable nature of the climate, the depth of the seas, and the position of land and water at that period of time.” This lecture evinces much labour and research; first as regards the principles by which the geological history of past times is deciphered, and secondly, as to the variety and interest of the organic remains of the London Clay. We recommend an attentive perusal of this portion of the work, as treated in a novel, instructive, and pleasing manner, and in which the author acknowledges the sources of his information respecting the fossil remains of the formation, and compares their numerical proportion with those occurring either in Britain or elsewhere. These are treated of in an ascending order.

Commencing with the lowest or most simply organized creatures, the *Foraminifera*, a tribe which swarm in our present seas, and form the food of mollusca and fishes, the author states that ten genera have been noticed, including many species. There are ten species of Corals,—none, however, belonging to the reef-building forms. Of Echinoderms, or the Sea-urchin tribe, there are seventeen species, some of which, as the *Ophiura Wetherellii*, must have been abundant and quietly entombed in the muddy sediment, “since Mr. Wetherell found at Highgate a septaria about 3 feet in diameter, of which the surface was literally covered with hundreds of these delicate radiated creatures in a fossil state.”

Although numerous, only eight species of Crustacea had been described at the time of Mr. Prestwich's lectures; but the recent publication by Prof. Bell\* indicates 17 species; 4 of *Macrura*, 10 of

\* Palæontographical Society, 1856. We cannot but regret that the



*Brachyura*, and 3 of *Anomura*. On our coasts, at present, between 30 and 40 forms of the Crab, Lobster, and Shrimp tribes are known. The Mollusca number 220 species, including 7 species of *Nautilus*, of which latter only two living species are recorded. About 100 species of fossil fish are numbered, a large proportion belonging to the Shark and Ray tribes, and others having affinities with those of warmer latitudes; while some forms resemble others now so plentiful in the British seas, as the Herring, Eel, Cod, and Whiting. Between eighty and ninety fossil fish have been obtained from the Isle of Sheppey,—a limited area as contrasted with the whole British seas, which contain about 160 species. Of Reptiles about fourteen species now exist in England; but twenty-one species occur in the London Clay, of which eighteen belong to Turtles and Tortoises. There is something suggestive in the fact, that while all the tropical seas of the world have yielded but five species of marine Turtles, no less than ten species have been found within a limited area in the London Clay.

Remains of birds and mammals are very scarce; but the vegetable kingdom furnishes us with a group as marvellous as those of fishes and reptiles in the animal kingdom. Leguminous plants and Coniferous trees were somewhat abundant, especially the former; Palms also, related to the *Nipa*; while the Cotton- and Orange-trees had their analogues; and with them also occurred a proteaceous plant, *Petrophylloides*, related to a group characteristic of the vegetation of Australia.

The third lecture continues in descending order the lower London Tertiaries, that variable and irregular group of marine, freshwater, and estuarine origin, known as the Basement-bed, Woolwich and Reading series, and Thanet Sands;—the latter forming “underneath London and the adjacent districts a large and important water-bearing stratum,—that which supplies all the early and many of the later Artesian wells,” the origin and principles of which are fully explained (p. 68).

This portion concludes with certain theoretical considerations, in which the author dwells upon the probable extent of the old Chalk area,—the seas, land, islands, and climatal conditions of the older Tertiary and London-clay periods, and the subsequent changes in the physical geography of the district around London.

Originally given as lectures, and not intended at first for publication, Mr. Prestwich naturally avoided any details that would be uninteresting to his audience (which can be readily appended in any future edition); his intention, which is successfully carried out, being to interest his hearers in the general geological principles, and

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author of this valuable monograph should not have fully availed himself of some of the fine specimens of fossil Crustacea from the London Clay in the Hunterian Collection of the Royal College of Surgeons, as additional objects of illustration for his memoir,—specimens collected at so early a period, and evincing the interest which the great comparative anatomist took in this portion, as he did in every other, relating to the fossil relics of past creations.



to stimulate them to further inquiries, "the object of which is to interpret truthfully and earnestly those records of past creations, the memorials of which exist within our reach, although buried and obscured in the ground beneath our feet."

Besides the illustrations of fossils and diagrams, the work is accompanied with an outline geological map of the neighbourhood of London, and section of the Drift and London Tertiary strata.

*A Catalogue of the Lepidopterous Insects in the Museum of the Hon. East India Company.* By THOMAS HORSFIELD, M. and Ph. D., F.R.S., Keeper of the Company's Museum, and FREDERIC MOORE, Assistant. Vol. I. Printed by Order of the Court of Directors. London, 1857. 8vo, pp. v and 316, and 18 Plates.

The recent opening of the very extensive and splendid additional Museum in the East India House, and the publication of the volume before us, at a time when the Hon. Company itself is overshadowed by so dense a political cloud, are circumstances which speak volumes for the energy of the Company and the activity of its servants.

Thirty years ago, the veteran naturalist whose name first appears on the title-page of the work above noticed, published two Parts of a Treatise on the Lepidopterous Insects of Java, the materials for which had been collected by himself, comprising a truly valuable series of illustrations of the transformations of a great number of highly interesting species of butterflies. The plan on which the work was published, we are now told by the author, could not ensure public support. It was in fact far too costly and elaborate, and consequently the publication of it was discontinued after two Parts had appeared in 1828 and 1829. The materials, however, which those two numbers contained were of the utmost value for a true classification of the Order, consisting as they did not only of truthfully executed illustrations of the transformations, but also of elaborate analyses of the perfect insects themselves. Entomologists therefore who felt an interest in the subject beyond the mere possession of a cabinet of specimens, regretted the discontinuance of the work, and the non-publication of the abundant materials remaining in the portfolios of the author. Time, however, wore on, and the system of Catalogues published by the Trustees of the British Museum induced the Hon. Company to commence the publication of a similar series of Catalogues of the contents of their Museum. Several of these have appeared, and now we have before us the first volume of the Entomological Series, in which the whole of the Eastern Diurnal and Crepuscular Lepidoptera, six hundred and fifty in number, are catalogued, accompanied with coloured illustrations of their transformations, occupying twelve crowded plates, together with six plates filled with figures of new species. Not only are the whole of Dr. Horsfield's own collection of drawings of the transformations of the Javanese species of these two divisions now published, but also several valuable series of similar drawings of continental Indian species by A. Grote, Esq., Lady





1858. "The ground beneath us: its geological phases and changes. By J. Prestwich, F.R.S. &c. London: J. Van Voorst. 1857." *The Annals and magazine of natural history; zoology, botany, and geology* 1, 362–367.

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