

inquiries were suggested by Prof. Herdman, and his energy and influence have evidently contributed largely to the success of the work. It is intended that the Committee shall endeavour to found a sea-side laboratory and form a permanent organisation for marine biological research, but its first operations in the summer of 1885 were limited to expeditions for obtaining invertebrate specimens, by dredging, trawling, and tow-netting from steam-tugs, and collecting on the shore at low-tide.

The volume consists of a number of reports by the members of the Committee and other naturalists on separate portions of the collections made. The greater number of these reports are lists of species, with a record of the places where each occurred; one or two of the papers deal with matters of more general scientific importance. Prof. Herdman himself identified the Alcyonaria, the Echinodermata, the Nudibranchiata, and the Tunicata, and also is jointly with two other gentlemen responsible for the Hydrozoa. Mr. Hoyle records the Cephalopoda. The experience of these naturalists is a sufficient security for the correctness of their work. In the list of Vermes given by J. A. Harvey Gibson, there are one or two errors which lessen its value. *Cirratulus borealis*, Lamarck, and *C. cirratus*, O. F. Müller, are set down as separate species, and it is stated that the latter, of which a single specimen was dredged, has not previously been recorded from the locality. The two names are synonyms, and to what species the single specimen "in a rather mutilated condition" belonged remains an open question. *Nephtys hembergii*, And. and M. Edw., is given as a synonym of *N. longisetosa*, Oersted, but the two names undoubtedly refer to distinct species, and it follows that the specimens of *Nephtys* examined were not accurately discriminated.

Mr. Harvey Gibson contributes another paper on the structure of some of the Polychæta, in which he gives some interesting notes on certain anatomical points, and gives reasons for concluding that *Pectinaria belgica*, Pallas, and *P. auricomis*, Müller, are synonyms. A short paper by Prof. Herdman, on variation in the Tunicata, discusses the value of different characters in these animals as diagnostic marks, and points out the necessity of thorough anatomical examination in describing species, or even identifying individuals. A species of *Sycandra* which could not be identified with any already known, and which is therefore probably new, is described by Mr. Harvey Gibson under the name *S. aspera*.

Three introductory papers precede the more special part of the book: one in which Prof. Herdman gives a history of the origin and work of the Liverpool Marine Biology Committee; one by the Rev. H. H. Higgins, containing a review of previous work in the domain to which the volume refers; and one by Prof. Milnes Marshall on shallow-water faunas. In this last a short but interesting comparison is made between the peculiarities of the physical conditions of the littoral region and features commonly occurring in the life-cycle of its inhabitants. Prof. Herdman, in summing up the results of the first year's work of the Committee, gives the following figures:—913 species of invertebrates have now been recorded from the district under examination, of which 235 are new finds made by the Committee: 16 of these are new to the record of the British marine

fauna, and 7 species and 3 varieties are new to science. These additions to zoological knowledge are illustrated by ten lithographic plates, which, with the exception of Plate II., containing coloured figures of Anthozoa, and Plate IV., devoted to small crustacean forms, do not attain a very high standard. There are also two maps showing the district explored.

#### OUR BOOK SHELF.

*Oberpliocæn-Flora aus den Baugruben des Klärbeckens bei Niederrad und Schleuse bei Höchst a. M.* T. Geyler und F. Kinkel. (Frankfort, 1837.)

As a general rule, the more recent the fossil flora the more satisfactory the determinations of the plants comprised in it will appear, though the work of Williamson and others has made an exception of those of the Carboniferous period. In the late Tertiaries the species are so closely allied to those still living that comparisons are relatively easy; but as we go back in time they diverge more and more, and there is less to guide us. The Pliocene floras especially show us that innumerable species that are now exotic were indigenous probably down almost to glacial times, and their study sheds an immense light on the more problematical floras which preceded them.

This work describes a Pliocene flora recently discovered, and regarded as newer in age than those formerly described from the valley of the Maine. It deals chiefly with the fruits of well-known existing genera of north temperate regions. A remarkable exception is an Australian type of *Callitris*, *Frenelites*, which appears to be correctly determined. The pines are numerous, among them being *Pinus montana*, and two varieties which are raised to the rank of species—*P. cembra*, determined on part of a cone, *P. strobus* on a scale, and some perfect examples named *P. cortesii*, Ad. Brong. Other conifers are the larch, the silver fir, and the Norway spruce. The American swamp or deciduous cypress, so prevalent in Europe from the Eocene age onward, is represented by foliage. Among the rest are leaves and supposed seeds of the hornbeam, the cup of an acorn, an abundance of beech-nuts, described as *Fagus pliocænica*, and the horse-chestnut, representing the Old World; and fruits of *Liquidambar*, *Nyssa*, a walnut, *Juglans cinerea*, and another nearly allied to *J. nigra*, and three hickories, representing the New. The European and American forms thus appear about equal in number, and there is one Asiatic, the horse-chestnut, and one Australian form.

The data are more trustworthy than are ordinarily obtainable from fossil floras, and they bring into prominence one significant fact—namely, that whenever we get the oak, hazel, walnut, or chestnut in strata so recent as the Pliocene, or even as true Miocene, there is no uncertainty about the genera, for fruits and other organs besides leaves are present; but in the older Tertiaries no distinct fruits of the kind are ever associated with the leaves ascribed to these genera. The evidence I have personally collected in the field seems to show that the early Eocene and pre-Eocene Dicotyledons had small clustered fruits, like *Platanus*, *Ainus*, *Liquidambar*, &c.; that leguminous plants were an Eocene development; while the larger-seeded oak, beech, walnut, hazel, are of later origin. The reliance placed on the mere similarity in the outward appearance of leaves of common types has not been justified by later discoveries, and an immense amount of revision is requisite before the botanist and geologist can safely put his trust in the descriptions of the older Tertiary floras.

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