of Prof. G. H. Cook, bids fair to outrank those already mentioned, as it alone combines all the elements for successful completion. It has the advantage of thorough triangulation, including twenty-six primary stations furnished by the U. S. coast-survey, — a work still in progress, but approaching an end. This is illustrated by a very delicately prepared map in Professor Cook's annual report for 1882. The process of local triangulation and levelling was begun in the northern part of the state, and field-observation is already done for most of the area lying north of a line from Belvidere to Sandy Hook. The area of which the sheets have been published contains 847 □ miles of New-Jersey land, and laps eastward on New York. Its centre is near Orange, and it includes Paterson and Perth Amboy north and south, and Brooklyn and Boonton east and west. The scale is one mile to an inch (1 : 63,360), sufficiently detailed to show all the artificial topography even in the city portions of the map, and to include many of those mythical rectangular streets laid out on town plans, and 'accepted' by the local authorities, although often entirely regardless of the lay of the land. The contours are drawn in faint red lines, showing differences of level of ten feet in plain country, and twenty feet in the hilly portions. Water-surfaces are colored blue, and depth-lines are drawn at intervals of ten feet. The chief topographic features thus shown are the strong, regular lines of the triassic trap-ridges, — the Palisades and the double Wachung Mountains, — with their bold eastern face and long slope, on the west; the more irregular highland country of the azoic rocks, on the north-west; the great area of salt-marsh lands, built up to tide level along the Hackensack River and Newark Bay; the extensive fresh marshes and flats on the upper course of the Passaic, within the curve of the Wachung range, — the remains of an old lake held by drift-barriers, as explained in the report for 1880; and, finally, the line of the terminal moraine, especially as it crosses the flat sandstone country from Metuchen northward to Locust Grove, where it climbs the trap-range. Even in this short distance, over forty of its characteristic little ponds, that would be quite unnoted on ordinary maps, are shown upon its rolling back. The completion of this map for the entire state will be an immense gain for its people.

The distinctly practical ends that mark the work of the New-Jersey survey justify the subordination of natural to artificial topography; the former being mostly indicated in the fainter red, and the latter in the stronger black lines. It would be, however, of much practical as well as scientific interest to try a reversal of these colors on a special edition of the map, in order to show more distinctly the natural features of the state, and give a properly secondary place to the towns, railroads, and lettering. As now printed, the ridges of the Wachung Mountains are rivalled by the Central railroad with the parallel roads beside it; and the mountain form is obscured, except to a very close search, among the streets of Orange and Paterson. And, as where so much good work has been accomplished we naturally look for more, it seems not too much to hope that future years may see the entire map appear with geological colors, in which the detrital surface-deposits are shown, as well as the consolidated underlying formations, the latter being indicated only where they outcrop, or are covered by an insignificant soil.

CRUSTACEA OF THE BLAKE AND TRAVAILLEUR EXPEDITIONS.

Recueil de figures de crustacés nouveaux ou peu connus. Par M. A. MILNE-EDWARDS. 1ère livraison. [Paris], April, 1883. 3 p + 44 pl. 4°.

THE coast-survey dredgings, under the direction of Pourtalès, in the Straits of Florida, first revealed the wonderful richness of the crustacean fauna beyond the shallow waters of our southern coast. The earlier collections of Pourtalès were unfortunately lost in the great Chicago fire; but Stimpson's preliminary report on the Brachyura, published in 1870, gives some indication of their extent. The subsequent explorations, under the direction of Pourtalès, the elder Agassiz, and Stimpson, more than replaced the collections destroyed at Chicago; while the work of the Blake, under the direction of Alexander Agassiz, in 1877, 1878, 1879, has far excelled all earlier explorations in bringing to light great numbers of new and remarkable forms. All the crustacea from these later explorations have been submitted to Alphonse Milne-Edwards of Paris, who has from time to time described and figured a considerable number of the Brachyura in his great work on the crustacea of Central America and the Mexican region. The progress of this work has been exceedingly slow, however, the Carcinoplacidae not yet being reached; so that the groups containing the most remarkable forms were left untouched until the appearance of the preliminary report on the Blake crustacea in the bulletin of the Museum of comparative zoölogy. This short report, though extending only to the higher Macrura,

enumerates over two hundred species, and characterizes as new to science twenty-eight of the genera and more than a hundred of the species. As a continuation of this report, preliminary notices of more of the Macrura appeared in the *Annales des sciences naturelles* for 1881. The explorations of the Travailleur on the other side of the Atlantic in 1880, 1881, 1882, have also brought to light numerous new forms, which have been briefly described or mentioned by Milne-Edwards in several reports upon the work of the Travailleur. These preliminary reports of Milne-Edwards, though they revealed astonishing discoveries, gave very little idea of the strange new forms discovered; and the accumulation of such a mass of imperfectly described genera and species was fast becoming a serious obstruction to the work of others in the same department. The work which is the subject of this notice begins to obviate this difficulty by the issuing of advance figures of the new forms referred to.

This first fasciculus of the work consists of a titlepage and a two-page list of plates printed by some autographic process, and forty-four plates, of which thirteen are engraved, and the rest printed like the titlepage and list of plates. The engraved plates are all proofs before letter, and represent species from the Travailleur expedition only, while the autographic plates represent species from both Travailleur and Blake expeditions, and a few from other sources. None of the plates are numbered in any way, — an unfortunate omission, which renders references to them difficult; but the names of the species are printed on them, and on the autographic plates the station and depth are usually added. The whole number of species figured is sixty-one; of which thirty-one are from the Travailleur, twenty-six from the Blake, three from the U. S. fish-commission, and one from the Godeffroy museum. The autographic plates, though rough in appearance, are apparently quite as accurate as the highly finished engravings, and have the great advantage of showing the work of the draughtsman only.

The most remarkable forms figured are from the Blake collection. Phoberus caecus, one of these, a Macruran as large as the lobster, resembles Palaemon in external form, but has rudimentary eyes not projecting beyond the carapax, and is said to have branchiae like the Astacidae. Xylopagurus rectus is a hermit-crab, which inhabits tubular stems of plants open at both ends, has a bilaterally symmetrical abdomen with the penultimate somite developed into a calcarous operculum, which closes the posterior opening of the tube. Pylocheles Agassizii, another hermit-crab, lives in cavities in hard fragments of agglutinated sand, and has a well-developed, symmetrical abdomen like the typical Macrura. One of the most interesting types is Glyphocrangon, represented by three species, the figures of which well illustrate the utility of figures and the slight value of Milne-Edwards's preliminary descriptions. The figures show Glyphocrangon to be the same as my Rhachocaris, figured and described in a report on the Blake crustacea of 1880 (*Bull. mus. comp. zoöl.*, x.). The genus was described by Milne-Edwards as having the telson completely consolidated with the preceding somite; which is not the case, the telson having a movable, though peculiarly constructed articulation, which is like the articulations between the three preceding somites of the abdomen. The structure of these articulations, which seem to have been wholly overlooked by Milne-Edwards, is so remarkable that I quote the following from my original description: —

"In addition to the ordinary hinge at each of the articulations, there is a process arising from the anterior somite just below the hinge, and curved backward and upward concentrically with the hinge; and this process fits accurately, and is slightly overlapped along its edges by a similarly curved groove in the posterior somite. When the abdomen is completely flexed, the ends of these curved processes project dorsally considerably beyond the grooves; but, when the abdomen is fully extended, the processes are withdrawn so as to expose the dorsal part of the groove; and in this position, in the contracted alcoholic specimens, the somites are firmly clamped, apparently by the pressure of the ends of the processes upon the concave posterior walls of the grooves, and held rigidly extended, so that it is very difficult to flex the somites, unless the tip of the abdomen is pulled backward with considerable force, when the processes slide easily through the grooves, and the somites are readily flexed. It is probable that in life, while the extensor muscles of the abdomen are relaxed, the processes move easily through the grooves; but, when the extensor muscles are strongly contracted, the hinges are clamped, as in the alcoholic specimens, so that the animal can voluntarily hold the telson and the spiny terminal somites of the abdomen rigidly extended as a means of self-defence."

Another remarkable peculiarity of the genus, not noticed by Milne-Edwards, is the articulation of the coxae of the external maxillipeds with the edges of the carapax. Pontophilus Jacqueti, from the Travailleur expedition, is evidently not a Pontophilus, but a Ceraphilus, and is apparently identical with my C. Agassizii from this side of the Atlantic.

Nearly half of the species figured apparently belong in or near Pandalinae and Ephyrinae, which seem to be the most abundant of the deep-water Macrura. S. I. SMITH.