THE FOSSIL FLORA OF GREENLAND.

Die fossile flora der polarländer. Von Dr. Oswald Heer. Vol. vii. Zürich, *Wurster*, 1883. 275 p., 62 pl. 4°.

This volume contains, 1°, the flora of the upper cretaceous schists of Patoot; 2°, the tertiary flora of Greenland; 3°, a short memoir on insects' remains found in connection with the plants (cf. Science, i. 1095); 4°, general remarks on the affinities of the plants in relation to their geological age and the climatic circumstances indicated by their characters; 5°, a memoir by Steenstrup on the geology of the localities where remains of plants and coal-deposits have been found; 6°, the marine fauna, with descriptions of the species of invertebrate animals found especially in connection with the plants of Patoot.

This last locality represents the upper member of the cretaceous of Greenland; the lowest being that of Kome, the middle that of Atane. The flora of Patoot has a predominance of conifers and ferns, no Cycadeae, and few monocotyledons, about one-half of the plants being dicotyledons. The table of distribution, which represents the whole cretaceous flora of Greenland, enumerates 335 species, — 88 for Kome, 177 for Atane, and 118 for Patoot. From the characters of the plants, the schists of Kome are referable to the Neocomian. Atane, whose flora is related to that of the Dakota group of Kansas, represents the Cenomanian, while Patoot is apparently Senonian. Most of its species are related to those of Atane, only a few being identified with eocene species from Sezanne and with some miocene types. The plants of the tertiaries of Greenland have been procured from twenty different localities. Their description is also followed by a table of distribution. Of the 282 species enumerated, 33 are known from the tertiary of North America, 10 of them from the Laramie group. The greater number are identified with species found in the lower miocene of Europe, the Aquitanian group, whose flora is widely represented in most of the states, from Hungary to England and France, and from Italy to North Germany. This tertiary flora of Greenland has been predominant, and has preserved its characters for many thousands of years; for the lower strata, where its remains have been found, are separated from the upper, which have the same kinds of plants, by thousands of feet of basaltic masses the deposits of which have been continuous for long periods of time.

In the general remarks considering the climatic conditions which have governed the vegetation as indicated by the characters of the flora, Heer says, that in 1868, from data derived from the determination of 105 species of plants, he had estimated the mean temperature at 9° C.; but now the tertiary flora of Greenland, known by a larger number of plants of various types, — among them a palm, species of Laurus, Magnolia, Diospyros, Sapindus, Zizyphus, etc., whose analogues are now found in Virginia, the Carolinas, etc., — indicates by its constituents a mean temperature of 10° to 11°.

The few mollusks and star-fishes, mostly found at Patoot, have been determined by the French paleontologist, de Loriol. He considers them to be related to some of those described by Meek from the Fox Hill group. Steenstrup's memoir on the geology of the localities where the plants have been found is precise and detailed. It is illustrated by a number of good sections.

The work is accompanied by a map of the western coast of Greenland between 69° 15′ and 72° 30′ north latitude.

THE CHESAPEAKE OYSTER-BEDS.

Report on the oyster-beds of the James River, Virginia (etc.). Coast-survey report for 1881. Appendix, no. 11. By Francis Winslow, U.S.N. Washington, *Government*, 1882. 87 p., 22 pl., 3 maps. 4°.

Among the various investigations of the U.S. coast survey since its organization, the bearing of which is not confined to their geodetic, topographic, or hydrographic relations, the present publication is conspicuous.

By direction of the late superintendent Patterson in 1878, an investigation of the oyster-reefs or natural beds of the Chesapeake and vicinity was entered upon by Lieut. Winslow with the coast-survey schooner Palinurus. The intention was to determine the limits of the beds, their hydrographic features, the nature of the natural and artificial changes which they undergo, and the present distribution of living oysters upon them. It was proposed to thoroughly investigate a limited area, subsequent extension of the work to all the Chesapeake beds to be left for future decision. Under the term 'Chesapeake' we include here not only the beds in the waters of the bay specifically so called, but those in the extensions of salt water from the bay into the various inlets, arms, rivers, etc., adjacent to and continuous with it.

Originally the oyster beds or 'rocks,' as