

real conglomerate," giving evidence of "attrition," "fragmental accumulation," and subsequent metamorphism. The rounded stones were four to five inches through, and consisted of crystalline augitic and other rocks.

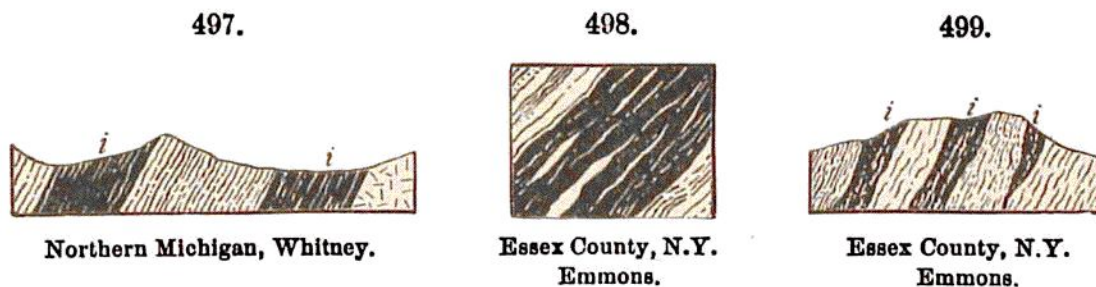
In the recognized *Huronian areas* on the north shore of Lake Huron, and in the Penokee-Marquette belt, south of Lake Superior, extending from Wisconsin into northern Michigan, the rocks are quartzite, siliceous schist, sandstones, conglomerates, micaceous and chloritic slates, chloritic greenstone, dioryte; and in Wisconsin there is a cherty limestone at the base, and carbonaceous as well as graphitic shales above.

A common feature of Archæan rocks, or at least of their veins, is the frequent occurrence of minerals containing rare elements, as niobium, tantalum, lanthanum, thorium, yttrium, zirconium, cæsium, rubidium, and others. The following minerals are common in Archæan rocks, or their veins: nephelite (elæolite), cancrinite, sodalite, spinel, chrysoberyl, danburite, amblygonite, spodumene, petalite, microlite, gadolinite, cryolite, besides others. But garnet, mica, andalusite, cyanite, staurolite, are less common than in later crystalline rocks. Chondrodite is usually, if not always, Archæan.

In the Kent-Cornwall ridge, west of Kent, Conn., and in the high land east of Tyringham, Lee, and Pittsfield, Mass., occur chondroditic limestones, like that of Sussex County, N.J., and at a locality east of South Lee, near the junction of the Archæan rocks with the Cambrian quartzite, masses of chondrodite occur as large as the fist.

One of the most characteristic features of the Archæan is the occurrence of *great beds of valuable iron ore*, some of them 100 to 400 feet thick. They are found of great thickness in Canada, northern and southeastern New York, northern New Jersey, and the region south through Virginia to Georgia; in the Penokee-Marquette belt, south of Lake Superior; the Missouri Iron Mountain region; also in Utah, Wyoming, Colorado, New Mexico, and Arizona, and elsewhere.

The ores are usually magnetite, hematite, and titanite iron, of bright, lustrous kinds; and in one region, in Sussex County, N.J., it is a zinc-manganese iron ore, called franklinite, mixed with disseminated zinc oxide



and zinc silicate. But, besides these kinds, there is also iron carbonate or siderite.

Figs. 497 to 499 show some of the positions of the ore-beds in metamorphic schists, the black beds *i* being the ore-beds, and the ore magnetite or hematite.

In Fig. 497, the ore-beds (of northern Michigan) are between beds of