

the limits of the State. Commencing with the most ancient, we have first a collection of metamorphic beds, comprising talcose and chloritic schists, with quartzites, siliceous slates, and bands of crystalline limestone, the whole being undoubtedly referrible to the Laurentian series of our Azoic rocks. The great iron deposits of Marquette belong to this division. The existence of Huronian strata within the peninsula does not appear to have been made out. To these Azoic rocks succeed the so-called "Lake Superior sandstones" of the age of the Potsdam group, but they are only developed in the higher portions of the State. The Calciferous sandrock is said to be unknown to the south of the Falls of Ste. Marie, the silicious and other limestones of the Trenton group immediately succeeding the Potsdam beds. It may be found, however, eventually, that much of the Lake Superior sandstone really belongs to the Calciferous subdivision, although we have not sufficient data at present to establish this. Many of the common Chazy and Trenton limestone fossils are cited by Professor Winchell from this outcrop of the Trenton group; and the formation is stated to stretch in a belt about four miles wide across St. Joseph's Island, and to reappear in the high bluffs opposite Little Sailor Encampment. From thence it extends across the middle of Great Sailor Encampment Island, and passes west in a gradually widening belt to the shores of Bay de Noquet and Green Bay, and onwards across Wisconsin into northern Illinois. Thirty-two feet is cited as its observed thickness in Michigan. The Hudson River deposits lie along the southern outcrop of the Trenton beds. Their dip carries them under the lower portion of the peninsula, but they do not reappear on the southern side of the basin, being covered at the anticlinal by some of the overlying beds. They are seen, however, further south, as in the denuded axis of Cincinnati, and elsewhere.

The Upper Silurian formations recognized in Michigan, comprise the Clinton and Niagara group, and the Onondaga-salt division. Some gypsum and a few brine springs occur in the latter, but the great salt formation of the peninsula belongs to a much higher deposit, a member of the Carboniferous series. The Devonian rocks are largely developed. They include, in ascending order, the upper Helderberg group, 354 feet thick, comprising the peculiar brecciated limestone of Mackinac, and other arenaceous and bituminous limestone deposits; the Hamilton group of bituminous and other limestones, 55 feet in thickness; the Portage group, 224 feet thick; and the Chemung group of 159 feet.