

pletely crystalline schistose or gneissic character, but for the most part the changes in the Upper Huronian rocks are those of cementation and metasomatism. As with the Lower Huronian areas of intense plication, they are sometimes but short distances from those in which the rocks have been merely tilted.

How deep the Upper Huronian denudation went it is impossible to say. We only know that at a maximum, the Upper Huronian rocks are now 13,000 feet thick, and in certain other places are entirely absent, the higher members disappearing first and the lower members last. Thus the difference of the Upper Huronian denudation is measured by 13,000 feet. To this must be added the unknown thickness of the Upper Huronian rocks, which have been wholly swept away, and the thickness of the Lower Huronian and Basement Complex, which were cut at this time. The thickness represented by these three elements is unknown, but it is probably great.

Of the outer limits of the Upper Huronian transgression, we are as ignorant as of the preceding ones, but certain it is that it had an extent to the outer areas mentioned as belonging to this series. Beyond these limits no knowledge is available. The original extent to the east, south and west of the Upper Huronian will probably never be determined, since the ancient rocks are covered by the Cambrian and post-Cambrian sediments. Whether the transgression extended over the Great Northern area of Canada to the Paleozoic deposits will doubtless be ascertained when this vast region is studied in detail.

*The Keweenaw.*—Again a change of conditions occurred, and a great flood of basic volcanics in beds of enormous thickness were poured out. Later these were followed by more thinly bedded volcanics. At about the same time a portion, at least, of the Lake Superior region became immersed in the sea, since in places the basement lavas of the Keweenaw are interstratified with sandstone and conglomerates.

The Keweenaw series is composed lithologically of gabbros, diabbases, porphyrites, amygdaloids, felsites, quartz-porphyrines, etc., and of sandstones and conglomerates. The basic and acid