

One to four of the above enumerated divisions of the southern and western area have been closely studied and are fully described in the publications of the Geological Survey, more particularly in the *Geology of Canada*, 1863, and in subsequent Reports to 1869, among which may be especially mentioned, "Catalogues of the Silurian Fossils of the Island of Anticosti," 1866, by the late E. Billings, F.G.S. Except in division 4, the Cambrian basin of Lake Superior, no further investigations have been made, either by the writer or by any member of the Geological corps, and there are therefore no new facts to add to those already published respecting the divisions 1, 2 and 3.

In the *Geological Map of 1866*, the rocks of division 4 are assigned to the horizon of the Chazy and the Quebec Group. While in the *Geology of Canada*, 1863, Chap. V, after fully describing these rocks, Sir W. Logan concludes with the following remarks:—"The affinities of the red sandstone of Sault St. Mary would thus appear to bring it into the position of the Chazy rather than the Potsdam formation; and if this were established, the copper-bearing portion of the Lake Superior rocks might reasonably be considered to belong to the Calceiferous and the Potsdam formations." Recently these upper copper-bearing rocks of Logan have been divided by Dr. Hunt into three series, named by him Animikie, Nipigon and Keweenaw* with certain suggestions as to their relative position which are wholly untenable, viz., to the effect that the Keweenaw series is Pre-Cambrian and the Nipigon and Animikie post-Cambrian and perhaps Mesozoic." After a somewhat careful though still incomplete examination of these rocks there is in the opinion of the writer, no reasonable doubt of the age of the whole being Lower Cambrian, as supposed by some of the earlier investigators—Whitney, Foster and others. Between Thunder Bay and the east end of Nipigon the three series follow each other without apparent unconformity and dip at a generally low angle towards the lake. Up to the summit of the Nipigon series, which extends around and partly fills the basin of Lake Nipigon, there are many large interstratified beds of columnar diabase, then follows the Keweenaw series, consisting of red and white sandstones, coarse conglomerates and a great thickness of amygdaloidal lava (melaphyre) and other volcanic ejectamenta, the whole, from the base of the Animikie to the summit of the Keweenaw, being cut by trap dykes, masses of diabase-porphry, dolorite, &c. The dykes sometimes present a very perfect columnar structure at right angles to their dip.

This great volcanic series of Lake Superior bears a precisely similar relation, to the Archæan system—Huronian and Laurentian—on the

* Azoic Rocks, part 1, 2nd Geol. Survey of Pennsylvania, Report E.