## Adams, Barlow and Ells-Conadian Laurentian. 179

south of the St. Lawrenee in the Adirondaek region, and are now being mapped, it will be of great interest to ascertain whether the same relations do not also exist in that area, and whether a continuation of the Hastings series to the south cannot be recognized in the "Huronian Schist" of St. Lawrenee and Jefferson counties, shown upon the Geological Map of the State of New York, which has just been issued by the Geological Survey of this State.

It is perhaps innecessary to draw attention to the fact that the recent investigations of Messrs. Wolff, Brooks, Nason, Kemp, Westgate and others on the crystalline linestones of New Jersey have a certain bearing on this subject.

Remarks by R. W. Ells :

In connection with the statements advanced in the preceding paper by Dr. Adams and Mr. Barlow, it is but right that the conclusions arrived at from the study of the similar rocks in their eastern and northern extension should be stated. The investigations in this quarter have now been carried on for six years, and have extended over a very large area to the north of the Ottawa, in which is included the typical Grenville series of Sir W. E. Logan, and extending far up the Gatineau River; while to the westward, the work has been carried on till the vicinity of the area, described in the accompanying paper, has been reached. It may be said therefore that the detailed examination of the rocks which make up the Grenville and Hastings series has extended over an area about 250 miles in length by 75 miles in breadth.

In the early days of the study of these rocks much difficulty was experienced. Firstly there was a great and almost inaccessible wilderness, the only available means of travel over the greater portion being by canoes; and in the second place there was an almost entire lack of trained observers to carry on the work. Add to this the entire absence of microscopical determinations, and one can readily comprehend the difficulty experienced in the attempt to solve this most difficult of the problems in Canadian geology.

Foliation and stratification were considered conclusive evidence of sedimentation, and as most of the rocks of the great Laurentian complex gave evidence of these forms of structure, the inference naturally followed that the greater portion of the gneissic, granitic and anorthositic rocks were of sedimentary origin. So far was this sedimentary theory earried out that, in the earlier reports of the Geological Survey, even the masses of binary granite and many of the pyroxenic rocks were included in the same eategory. This was at the time a very natural conclusion, since many of these masses have a regular bedded structure and conform, over very considerable areas, to the regular stratification of the rocks, either gneiss or crystalline linestone. As the country became more accessible the

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