crustal magma might be irrupted within the overlying crustal rocks without the intense folding of the latter. Here we should expect to find a less pronounced alteration, due only to the proximity of the magma, and an absence of those phases of metamorphism which accompany the rock shearing, crushing, and stretching due to dynamic agencies. In the common case, where the upper crustal rocks are folded, varying phenomena would also be observed according as the folding took place before the fusion which produced the magma immediately beneath the crust or while the latter was floating upon the magma.

There are also more complicated cases which are doubtless common. These are due to the superimposed action of crust-crumpling, rock-shearing, strata-squeezing forces subsequent to the establishment of the Archean conditions in their primal simplicity. These are possibilities which must be borne in mind in attempts to apply the theory here advanced to the Archean in other regions. It is easily conceivable that had the country northwest of Lake Superior been subjected to extensive deformation in post-Archean times, the evidence whereby the irruptive character of the Laurentian has been demonstrated might have been entirely obscured, and the true relationship might have remained unsuspected, as appears to have been the case in better known regions.

Similar Observations elsewhere.

In various parts of the world observations have been recorded which show that the phenomena arising from the irruption of a local or general subcrustal magma through an overlying crust, and the consequent development of a complex of gneissic igneous rocks and metamorphic strata, are not peculiar to the region studied by the writer.

MacFarlane* long ago described and figured good evidence of the irruptive character of the Laurentian of the northeast shore of Lake Superior; but, in accordance with the views of the extreme plutonic school, he regarded the whole complex of intrusive and intruded rocks as the first crust of the earth, and the angular fragments of hornblende schist as earlier separations from the same magma as that which crystallized into the Laurentian granite or syenite-gneiss.

Mr. Frank Adams, who has been for some years past engaged in a study of the Laurentian of the Province of Quebec, north of the St. Lawrence, says—

"The unexpected fact was ascertained that the so-called massive and stratified varieties of this rock [anorthosite; hitherto regarded as upper Laurentian and meta-

* Geological Formations of Lake Superior. Canadian Naturalist, N. S., Vol. III, 1867, p. 177.