

veins similar to those caused by shrinkage on cooling in granite of admittedly eruptive origin. 5. It contains fragments of slates and schists imbedded in it. He also states that the evidence afforded by the study of thin slices confirms the conclusion arrived at by the stratigraphical evidence, and gives a summary of the microscopic evidence.*

The very able and precise descriptions by Barrois† of the various granitic irruptions which have affected Brittany at different ages from the pre-Cambrian up to the Carboniferous show beyond question that not only in Archean times, but at various subsequent periods were the conditions which characterize the Archean of Canada reproduced. He describes particularly the "granite gneissique," demonstrates its irruptive origin, and notes not only the contact metamorphism, but also the injection of these rocks "en filonnets minces et répétés" within the encasing schists. His descriptions and figures of repeated injections of granite within the schists, so as to produce an alternation simulating bedding, closely corresponds with the contact phenomena described by the writer as observed between the Laurentian and Keewatin on the Lake of the Woods, the interpretation of which is entirely in accord with that of Barrois, though questioned by Professor A. Winchell.‡ It would appear that just as in Hunter's island, north-west of Lake Superior, we have two generations of Laurentian rocks from a sub-crustal magma, so in Brittany there have been several generations of similar rocks breaking through the overlying crust, extending in time as late as the Carboniferous.

In Norway Kjerulf§ places the "Gebanderte granit, oder gneisgranit" with the eruptive rocks, and states that in numberless places such rocks break through the strata of the grundgebirges, and also, indeed, through the Bergenschiefer in which Reusch has since found Silurian fossils.|| In the greater part of Norway he says (translated freely)¶—

"What was formerly recognized as gneiss must on the map be now designated as granite. The reason why the older observers assume it to be gneiss is the granular banded structure, which we must distinguish from the appearance of bedding. On older maps are shown also other great regions in which the dip and strike of the beds is given, an attribute which they do not in reality possess; and the reason for this lies in the confounding of foliation with bedding. * * * The rock, according to the old conception, is granite when no bedding occurs in it. The modern view, which had already been announced by Delesse, says: 'En réalité c'est [le gneiss granit] seulement une variété du granit, qui est veinée et qui paraît avoir été gênée dans sa cristallisation.' " **

* Geol. Mag., loc. cit.

† Bull. Soc. Geol. de France, 3me Serie, t. XIV, 1886, pp. 655-898.

‡ Geol. Survey of Minnesota, Fifteenth Annual Report, 1886, p. 201, § 5.

§ Die Geologie des Süd. und Mit. Norwegen, Bonn, 1880, p. 237.

|| Fossilien Führenden Schiefer von Bergen, Leipzig, 1883.

¶ Op. cit. p. 282.

** Delesse, Etudes sur le Metamorphism, 1861.