

glassy, a feature very rare in the basic rocks of East Kootenay. Under the microscope, the essential constituents of the gabbro are seen to be labradorite and pyroxene (Plate I, fig. 1). The labradorite occurs in lath-shaped individuals, which show carlsbad, pericline, and albite twinning. Filling the interstices between the labradorite crystals occurs the pyroxene which is of two varieties, hypersthene and augite. The augite is colourless and without pleochroism. Uralitization in all stages is common in this rock; in many cases crystals of hornblende occur with a core of augite. Where the secondary hornblende is in contact with the labradorite it has the characteristic pleochroism, greenish blue parallel to *c*, strong green parallel to *b*, and pale yellowish green parallel to *a*. This is worthy of notice as nearly all the hornblende in the hornblende gabbro is of this type and it also strongly supports the theory that all the hornblende is secondary in origin.

Calkins¹, from a study of similar intrusives in Idaho, south of the International Boundary line, maintains that the hornblende of the gabbro is secondary. An extract from his report may be quoted.

"The rock now under consideration (provisionally called diorite) is, on the whole, richer in quartz than the diabase of the Coeur d'Alene district, but otherwise similar except in the absence of augite; and this may be accounted for by the probably lesser age of the latter rock, which cuts across beds as late as the Striped Peak, while the diorite sills here described were not seen in contact with rocks younger than the St. Regis. These considerations, together with the character of the hornblende, suggest that dioritic rocks of this region are uralitized diabases and gabbros, and although complete proof is wanting, I am inclined to believe that such is the case."

An occurrence of similar nature has been described by C. H. Warren². The hypersthene of the Purcell Sills is about equal in amount to the augite and is characterized by a faint pink pleochroism parallel to *c*. It very frequently shows signs of alteration to hornblende.

In one instance, the hypersthene appears to have changed to a fibrous hornblende, which in turn was changed to a compact hornblende. The accessory constituents are small in amount and consist of magnetite in irregular grains, and apatite in long, colourless, idiomorphic crystals. One allotriomorphic crystal

¹Calkins, F. C., U. S. G. S., Bull. 384, p. 49.

²Warren, C. H., Amer. Jour. Sci., Vol. 26, 1908, p. 469.