EXPLANATION

Dw

Gray or pink quartz monzonite

Gray or pink, medium-grained, biotitic or hornblendic quartz monzonite, informally referred to as the Wabassus quartz monzonite, is best exposed on the eastern shore of Grand Lake between Grand Lake Stream and Dyer Cove Point - the type area - and in the road from Grand Lake Stream village westward to Wabassus Lake, and on prominent Wabassus Mountain, all in the Wabassus Lake quadrangle. The intrusive is believed to be of Devonian age, as it has not been regionally metamorphosed and intrudes rocks of Silurian(?) age. Commonly non-porphyritic, the particle size ranges from 1/8 to 3/8 inch; where porphyritic, microcline phenocrysts are 1/4 by 1/2 to 1 inch. This monzonite is believed to occur along the northern part of the west edge of the Wesley quadrangle because of the presence of large angular blocks of glacial float

Dl

Light gray quartz monzonite

Light gray, fine-grained, biotitic quartz monzonite is best exposed on the southeast side of Love Ridge, between Bog Lake and North Beaverdam Lake in the Big Lake quadrangle. It is believed to be of Devonian age for the same reasons as those given for the Wabassus quartz monzonite. The light gray, non- to slightly-porphyritic rock has an average grain size of 1/6 to 1/4 inch; it contains about 5 percent brown biotite, less muscovite, traces of hornblende, apatite, zircon, and pyrite. The rock is sheared and granulated at the type locality. It continues southeasterly a short distance into Wesley quadrangle, east of South Beaverdam Lake

Dg

Gray or pink granite

Fine-grained gray or pink biotite granite - in places very fine-grained and leucocratic - crops out a mile west of the main road at Seavey Lake, and south of Joe Hanscom Heath. Areas containing large glacial boulders southeast of Indian Lake might indicate its presence within the large area shown as gabbro-diorite. Fine- to medium-grained, gray to pink granite crops out along the main highway southeast of the area studied (Espenshade, G. H., written communication, August 11, 1956). Its possible, and that of other granites, are indicated by Chapman (1962) in part of the southern two-thirds and along the northern part of the eastern edge of the quadrangle.

Dp

Gabbro-diorite

Medium gray-green to black gabbro-diorite is exposed on the shores of Pocumoonshine and Crawford Lakes in the Big Lake quadrangle, and extends southward into the Wesley quadrangle. The intrusive mass has an average width of about 3 miles and length of 15 miles; it is about 6 miles wide in the Wesley quadrangle. As the granitic rocks, it is believed to be of Devonian age, but older than them. The rock ranges from fine-grained, salt-and-pepper hornblende diorite to coarse-grained (1/2 inch) gabbro, originally olivine-bearing. In some places, the rock has a gabbroic texture, in others diabasic. Most of the olivine and clinopyroxene, which show strong schiller structure, are in part altered to brown hornblende. Most hornblende is poikilitic, and contains the relict schiller. Magnetite, apatite, and reddish-brown biotite are common. The gabbro-diorite locally is cut by 6 to 8 inch dikes of medium-grained (1/8 to 1/4 inch) biotite granite. All contacts are believed to dip outward. On the basis of width of the contact metamorphic aureole, the dip is believed to be less steep on the west than on the east side. The western and southern contacts, at least, are of an interfingering nature, with tongues of intrusive gabbro alternating with hornfels. This feature is well shown along the St. Regis Paper Company road south of Joe Hanscom Heath. A small outcrop, which might represent a cupola, is near the southern end of First Chain lake. G. H. Espenshade (written communication, August 11, 1956) reported the presence of gabbro south of Bog Lake along the main highway that trends southeastward across the quadrangle, and Chapman (1962) indicates its presence here as a wide east-northeasterly trending band

DEVONIAN

Ocd

Dark Argillite Division of Charlotte Group of Alcock (1946)

The Dark Argillite Division includes dark gray to black phyllite and biotite schist, gray argillaceous, slightly metamorphosed sandstone and dark gray siltstone, quartzite, thin gray slate, and black graptolite-bearing carbonaceous slate. The last has been determined to be of Lower Ordovician age (Cuming, L. M., Newman, E. P., and Walmsley, V. G., written communication, October 2, 1963). Tuffaceous beds occur on the shore of Second Chain Lake. Most of the unit in the northwestern part of the quadrangle consists of impure gray quartzite and thin phyllitic slate, but quartz-biotite schist also occurs. Thin-bedded, white quartzite and dark gray slate occur on the point 1/4 mile northwest of the Thoroughfare between First and Second Chain Lakes, and thin quartz granule conglomerate occurs on Second Chain Lake near the northern edge of the quadrangle. This Division is characterized generally by a lack of notable carbonate where not contact metamorphosed, and is more tightly folded and severely metamorphosed than the Kellyland Formation (Pale Argillite Division of Charlotte Group of Alcock, 1946). Contact metamorphism has been strongest on the west side of the gabbro-diorite, where sillimanite, retrograded cordierite, graphite, biotite, and traces of magnetite, pyrite, and pyrrhotite have been found. Most outcrops along Route 9 northeast of Wesley are sulfide-stained. The area shown as Ocd between the gabbro-diorite and granite to the south and in the southwestern part of the area covered by the map has not been studied, and the presence of Ocd therefore is questionable

Contact metamorphism has darkened rocks over large areas indicated as the Dark Argillite Division of the Charlotte Group of Alcock (1946) on maps of this general area (Alcock, 1946; MacKenzie and Alcock, 1960a, b; Ames, 1963), thus increasing the problem of separating and mapping Kellyland Formation (Pale Argillite) and Dark Argillite. Similar metamorphism is believed to have resulted in some originally lighter rocks (Pale Argillite) having been grouped with Dark Argillite; the latter thus may not everywhere be the same stratigraphic unit. In this regard, a comparison of geologic and aeromagnetic maps (Canadian Geological Survey, 1957a, b) of nearby areas in New Brunswick is of interest, for many high magnetic anomalies are within Dark Argillite, and the shapes of anomalies resemble those of buried intrusives or their contact aureoles. Such metamorphism has affected the rocks in the northwestern corner of this quadrangle, especially

ORDOVICIAN

Economic geology

Faint sulfide mineralization associated with the gabbroic rocks, and the variety of rocks and structures observed would appear to justify detailed geologic studies throughout the quadrangle, particularly in the northern one-third. Geochemical analysis was made of a composite sample of 5 specimens from the outcrop near the southern end of First Chain lake, and indicated the presence of 150 ppm lead, 200 ppm zinc, 60 ppm copper, 25 ppm nickel, and 15 ppm cobalt. A semiquantitative spectrographic analysis of a single specimen from this outcrop yielded results of no interest. Elsewhere in the area studied, 16 sediment and one additional rock sample indicated no geochemical anomalies

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MacKenzie, G. S., and Alcock, F. J., 1960a, Geology, St. Stephen, Charlotte County, N. B.: Canada Geol. Survey Map 1096A, scale 1:63,360.

_____ 1960b, Geology, Rolling Dam, Charlotte County, N. B.: Canada Geol. Survey Map 1097A, scale 1:63,360.

Outcrop or group of outcrops

Leader indicates outcrop or point on outcrop where attitude was observed

Contact

Long dashed where approximately located, short dashed where inferred.

In places determined from glacial float

Zone of contact metamorphism

Shown where observed or determined from topography or glacial float

Inferred fault

Shear zone

Crenulated rocks

Minor fold

Strike and dip of beds

Dot indicates top of beds determined from sedimentary textures or structures

Strike and dip of overturned beds

Dot indicates top of beds determined from sedimentary textures or structures

Strike of vertical beds

Dot indicates direction of top of beds known from sedimentary textures or structures

Strike and dip of foliation

Used in combination with bedding symbol where parallel to bedding

Dot indicates direction of top of beds known from sedimentary textures or structures

Strike of vertical foliation

Used in combination with bedding symbol where parallel to bedding

Strike and dip of slaty cleavage

Strike and dip of slaty cleavage and overturned beds where parallel

Strike and dip of joint

Strike of vertical joint

Gravel pit

Passable graveled roads

Located approximately from maps of the St. Regis Paper Company

This map is preliminary and has not been edited for conformity with Geological Survey format and nomenclature.