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DENVER

EXPLANATION

Db / Dbt

Gray and pink quartz monzonite

The main mass of this rock, herein informally referred to as the Bottle Lake Quartz Monzonite (Db), is a gray and pink coarse-grained biotitic and porphyritic quartz monzonite pluton that extends from the Waite quadrangle southwestward into and westward across the Scraggly Lake and Springfield quadrangle into the Winn quadrangle (Rand, 1958; Doyle, Young, and Wing, 1961). It is well-exposed one mile northwest of Bottle Lake, along the road from Springfield southerly to that lake, in the Springfield quadrangle, where rounded and euhedral phenocrysts of potassic feldspar as large as 1 1/4 inches long and 1 inch wide have rapakivi texture. Porphyritic texture is common, and phenocrysts two inches long and 1 inch across are not uncommon. The northern contact of this rock is exposed in a recent cut along the St. Croix Paper Company pulpwood haulage road northwest of West Musquash Lake, in the Scraggly Lake quadrangle. The distribution of the pink and gray biotitic rock is random rather than systematic. The age of a sample taken from the Bottle Lake locality is about 410 million years, as determined by the lead-alpha method (Stern, T. W., written communication, March 23, 1962), or about 342 million years, as determined by the potassium-argon method (Thomas, H., Marvin, R., and Elmore, F., written communication July 2, 1962). The age of another sample of this rock taken from along the road from West Musquash Lake to Upper Oxbow Lake in the Scraggly Lake quadrangle, is 370 million years by the potassium-argon method, or 380 m.y. by the lead-alpha method (Faul, Stern, Thomas and Elmore, 1963). The reason for the considerable difference in age of samples from the two localities has not been ascertained. The northeastern tip of the pluton, extending into the Waite quadrangle, herein is informally referred to as the Topsfield (Dbt) granitic facies, being quite different from the main mass of the pluton. The gradational change may be in the vicinity of the North Branch of Vickery Brook, in the Scraggly Lake quadrangle. The Topsfield granite, well-exposed along Route 1, 2.5 to 3.5 miles north of the village of Topsfield, in the Waite quadrangle, is chiefly a pinkish red aggregate of microcline, quartz, plagioclase, and a little muscovite, biotite and hornblende. Texture is medium- to coarse-grained, the average size of feldspar crystals being about 1/4 inch. Rapakivi texture has been observed (Forsyth, 1955), as have traces of pyrite. Along the northern boundary of the granite, where crossed by Route 1, the rock is light gray and contains very little mica or hornblende; here the texture is similar to the red granite. The width of this zone or facies is about one-fourth mile. A 6-inch aplite dike cuts the red granite along Route 1. The rock is strongly jointed and sheared in a northwesterly direction, and weathering and erosion have penetrated deeply along these planes. This is well-shown on Farrow Mountain in the Scraggly Lake quadrangle, as indicated on the topographic map and aerial photographs, and reported by William Forsyth orally in August 1954. Good, fresh outcrops are along the new road from East Musquash Lake southwest toward the fire tower, where alteration along shearing is apparent. The northeastern part of the pluton is believed to have been emplaced along a fault separating the Kellyland Formation from rocks of Cambrian or Ordovician age. A sample of this granite taken along Route 1 contained 0.003 percent eU, and 0.001 percent U (Nelson and Narten, 1951). Age of the rock, as determined on a sample from along Route 1, is 372 million years by the potassium-argon method, or 400 m.y. by the lead-alpha method (Faul, Stern, Thomas, and Elmore, 1963). Both Db and Dbt are quite different from the Chiputneticook Quartz Monzonite in the Danforth (Larrabee and Spencer, 1963), Forest, and Vanceboro quadrangles.

Dw

Gray and pink quartz monzonite

This rock, herein informally referred to as the Wabassus Mountain Quartz Monzonite, is best exposed along the road to Wabassus Lake between Grand Lake Stream village and Grand Lake Brook, and along the east shore of Grand Lake north of Grand Lake Stream in the Wabassus Lake quadrangle, where it has been mapped by the author and S. S. Svenson. The prominent Wabassus Mountain is made up of this rock (Rand, 1958). The northeastern tip of the pluton extends into the southwest corner of the Waite quadrangle, at Amazon Mountain, and in the southeast corner of the Scraggly Lake quadrangle. The rock is medium to coarse-grained, with one-fourth to one-half inch average grain size, and potassic feldspar phenocrysts one-fourth by one inch. The rock commonly is light gray but in places is pink or flesh-colored; dark minerals generally are biotite and hornblende, the latter being more common near inclusions and borders of the pluton. In general, this rock appears to be somewhat finer grained and less porphyritic than the Bottle Lake Quartz Monzonite. Its age has not been determined.

DEVONIAN

Sd

Daggett Ridge Formation

Quartzite, metaconglomerate, metasiltstone and slate

The Daggett Ridge Formation is named for the ridge on which the rock is best exposed in the Danforth quadrangle, Maine; its type locality is along and south of the Maine Central Railroad. Chloritic argillaceous quartzite, quartzite metaconglomerate with fractured pebbles and cobbles as large as 8 by 12 inches, gray and gray-green slate and metasiltstone, and thin lenses of magnetite-bearing interbedded black slate and metasiltstone comprise the formation. The slate and metasiltstone unit crops out in the eastern part of the Wytopitlock quadrangle, Maine, and is believed present in parts of the Danforth and nearby quadrangles on aeromagnetic evidence (Griscom, Andrew, written communication, April 12, 1961). Thin green cherty lenses of rhyolitic metatuff occur along Baskahegan Stream near South Bancroft in the Danforth quadrangle. Only a small part of the formation is believed present along the north edge of the Scraggly Lake quadrangle. The formation is exposed over a width of about 3,000 feet in the Danforth quadrangle, where quartzite and metaconglomerate form most of the thickness, which is estimated to be one thousand or more feet. Inadequate exposures and isoclinal folding prevent an accurate determination of thickness of the formation or any of its members. The formation is assigned a Silurian age based upon meager paleontological evidence; a single dorsal valve of an orthoid brachiopod with branching costae and an apparent faint concentric ornamentation was found in the metaconglomerate unit (Newman, H. B., and Cloud, P. E., written communication, [illegible] 1961). [illegible] quadrangle, [illegible] 1962).

SILURIAN

Sk

Kellyland Formation

Gray metasiltstone, metasandstone, and slate

The Kellyland Formation of Silurian(?) age, named for the village closest to its largest and most representative outcrop at Grand Falls of the St. Croix River, in the Kellyland quadrangle, Maine, where it was mapped by the author and S. S. Svenson, is interbedded [illegible] pale gray metasiltstone, arenaceous metasiltstone, argillaceous metasandstone, and quartzite, and thin beds of [illegible] gray slate. [illegible] beds contain [illegible] the metasiltstone and coarser beds contain more carbonate than does the slate. Some of the coarser beds are tuffaceous. Slate commonly occurs in beds from 1 to 8 inches thick and locally from 1/8 inch to 3 or 4 feet thick. The metasiltstone and metasandstone beds commonly range from 4 inches to 4 feet in thickness, ranging locally to 20 feet. Rarely, beds of metasiltstone contain thin laminae of light and dark metasandstone. Thin beds of quartz granule metaconglomerate are associated with metasandstone and quartzite beds in places. The metasiltstone beds in many places have good graduation in texture, and cross-bedding. The average content of slate in the formation is about 20 percent, and the thickness of the formation has not been ascertained because of the lack of good key beds, continuous outcrops, and isoclinal folding; however, it appears to exceed 1,000 feet. The Kellyland Formation is the stratigraphic equivalent of at least part of the Pale Argillite Division of the Charlotte Group in New Brunswick (Alcock, 1946), and is believed to be the stratigraphic equivalent of map unit Sss in the Danforth and adjacent quadrangles in Maine. This unit is believed to be represented by a large, dark gray slate outcrop along Maine Route 6, 1.2 miles east of the Penobscot-Washington County line in the Scraggly Lake quadrangle.

SILURIAN (?)

Os

Dark gray slate, black slate and chert, and metatuff

Graphitic graptolite-bearing slate and metashale interbedded with thin black chert; white-weathering, commonly silicified, light gray rhyolitic metatuff, in a few places containing lenses and balls of medium-gray chert; brown-weathering metashale, slate, and metasiltstone; and medium-gray slate, metasiltstone, and metasandstone comprise the group of rocks herein informally referred to as the Snow Mountain Formation. This is best exposed on the north and northwest slopes of Snow Mountain, and the metatuff is also well-exposed on Stetson Mountain in the Danforth quadrangle. Electromagnetic methods were very useful in mapping the black chert units in the formation (Frischknecht and Ekren, 1960). Climacograptus and orthograptus fragments found near Danforth village in 1956 were identified and assigned a probably Middle Ordovician age (Newman, B. B., written communication, December 9, 1960). The metatuff, silicified in many outcrops in the Danforth and Springfield quadrangles, is calcareous in some places to the south, as along Maine Route 6 at the western edge of the Scraggly Lake quadrangle. The resistant silicified metatuff and associated black chert and slate underlie most northerly-trending ridges in the area except those underlain by hornfels.

ORDOVICIAN

Oss

Black slate and metasiltstone

Underlying the informally referred to Snow Mountain Formation is a series of interbedded black slate and metasiltstone beds, exposed only in cuttings from a water well in the southwestern part of the Danforth quadrangle. Its magnetic and electromagnetic properties are quite different from those of the Snow Mountain Formation, and it commonly is topographically lower. Whether it is a separate formation, or a member of the overlying formation is unknown.

ORDOVICIAN

O€u

Cambrian or Ordovician metamorphic rocks, undifferentiated

Chloritic quartzite, and green and red slates

A considerable thickness of greenish argillaceous and chloritic quartzite, sandy metasiltstone, thin beds of green slate, and rarely thin beds and lenses or red and purplish slate comprise the rocks of unknown but presumably Ordovician or Cambrian age; there is a remote possibility of a Lower Silurian age, as was indicated more positively for rocks in the southeastern corner of the Danforth quadrangle (Larrabee and Spencer, 1963). The quartzite and sandy metasiltstone, commonly in 1/4 to 1/2 inch beds separated by paper-thin laminae of green slate, have been minutely crumpled by slippage along the slate laminae, and the minute folds developed were later folded and foliated. This predominantly impure quartzite unit contains beds and lenses of green slate from a few inches to 2 or 3 feet thick, and occasional lenses of red to purplish slate from 1 to 6 inches thick and commonly less than 100 feet long. At Knownothing Cove in Baskahegan Lake, a few 1/8-inch nodules of hematite replaced by silica occur in the red slate. Rarely, a thin, pinkish quartz and feldspar granule metaconglomerate is present. These rocks are best exposed along the southeast shore of Baskahegan Lake, and the purplish-gray slate, thickened locally, is exposed along Route 1, in the southeastern corner of the Danforth quadrangle. A well for oil was fruitlessly drilled in these rocks at Brookton, in the Danforth quadrangle, in the 1950's. Well cuttings were chloritic quartzite, and red and green slate. The well was approximately 350 feet deep when measured in 1959. These rocks are well-exposed along the south shore of Baskahegan Lake in the Scraggly Lake quadrangle. The rocks extend northeastward through the Danforth quadrangle and into the Forest quadrangle, where they are well-exposed on islands in and on the east shore of Mayaz Lake. All except the red slate crop out along the Maine Central Railroad between Forest and Tomah stations, also in the Forest quadrangle. The impure quartzite with crumpled bedding and foliation, some of the green slate, and the quartz granule metaconglomerate crop out along Maine Route 6 west of East Musquash Lake. Although outcrops are lacking over wide areas where needed for determination of structural and stratigraphic relations with rocks of other ages, the rocks of Ordovician or Cambrian age are thought to have been faulted up into younger metasedimentary rocks in the area prior to intrusion of the quartz monzonite and granite.

CAMBRIAN OR ORDOVICIAN

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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature