REPORT OF INVESTIGATIONS

BERYL MOUNTAIN, SULLIVAN COUNTY, N. H.

BY

S. B. Levin
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UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

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INTRODUCTION

An exposure of large beryl crystals in pegmatite on Beryl Mountain, in Sullivan County, N. H., was the basis for investigation by the Bureau of Mines to determine the extent of the beryl mineralization and to expose other parts of the same zone that were favorable for additional beryl-rich shoots. Testing by surface cuts, trenching, and tunneling was conducted by the Bureau of Mines from August to December 1943.

ACKNOWLEDGMENTS

In its program of investigation of mineral deposits, the Bureau of Mines has as its primary objective the more effective utilization of our mineral resources to the end that they make the greatest possible contribution to the national security and economy. The Mining Division, Lowell B. Moon, chief, conducts preliminary examinations, does the actual investigative work, and prepares the final report. The Metallurgical Division, O. C. Ralston, chief, analyzes samples and makes beneficiation tests. The field work was supervised by Paul M. Tyler, regional engineer, and John D. Bardill, district engineer. S. B. Levin was in direct charge of the project.

LOCATION AND ACCESSIBILITY

The deposit is on the northeast slope of Beryl Mountain, 1 mile south of the village of South Acworth. The village, on State Highways 101 and 123a, is 12 miles northeast of Bellows Falls, Vt. The deposit is reached from South Acworth over a gravel-surfaced road and about 1,000 feet of good truck trail (fig. 1).

The nearest railroad siding is at Cold River, on the Boston & Maine Railroad, where there is also a fairly modern, but now idle, feldspar mill.

PHYSICAL FEATURES AND CLIMATE

Beryl Mountain is a prominent hill in an area having a relief of 500 to 900 feet. The main occurrence of beryl is in the northeast face of a quartz mass at an altitude of 1,090 feet.

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2/ Mining engineer, Bureau of Mines.

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The region is heavily wooded. The outstanding climatic feature is the long, severe winter with an abundant snow.

HISTORY

The occurrence of beryl on Beryl Mountain, originally known as Williams Hill, was known as early as 1840. The beryl and associated minerals were quarried sporadically on a small scale during the 19th century, but there has been no systematic or continuous operation. There has been no activity in recent years except occasional hand-picking of beryl fragments from the dump.

PRODUCTION

There is no record of the total production from the various small quarrying operations. It is reported that the dump yielded some 25 tons of beryl in the few years preceding 1942. In that year, about 5 tons were produced.

In the course of the investigation by the Bureau of Mines, nearly 8-1/2 tons of clean hand-picked beryl was obtained and sold by the property owner at approximately $140 per ton.

PROPERTY AND OWNERSHIP

The property known as Beryl Mountain consists of 60 acres, and is described in volume 230, page 362, of Sullivan County Registry of Deeds. The present owner is Sadie A. Cohen of Providence, R. I.

DESCRIPTION OF DEPOSIT

The beryl occurs in a pegmatite mass 1,000 feet long and 50 to 190 feet thick, which trends N. 55° E. and dips steeply southeast across the foliation of enclosing gneisses and schists.

Two distinct rock types comprise the greater part of the pegmatite that has been exposed. The central core, 40 to 70 feet wide, consists of massive white and rose quartz and contains several giant feldspar crystals. The core is flanked on each side by zones 25 to 50 feet wide consisting of a coarse, variable-grained aggregate, in which feldspar and quartz are the essential minerals, with accessory muscovite, biotite, and tourmaline.

The Beryl is localized at the periphery of the quartz core. The main exposure of beryl is found as a saddle-shaped zone in which beryl crystals 4 inches to 5 feet long, with large books of mica, are embedded in a matrix of feldspar.

CHARACTER OF ORE

Beryl occurs as nearly perfect prisms. Megascopic and microscopic examination reveal that the beryl is unaltered and is not contaminated by other minerals. Analyses of micro-selected specimens of the blue-green beryl which
Figure I. - Location of Beryl Mountain beryllium deposit, South Acworth, N. H.
Figure 2. - Tentative longitudinal section, Beryl Mountain.

Note: Beryl crystals shown diagrammatically, not to scale.

Tunnel is located in the Perithile-Quartz facies, footwall zone, along the core margin.
forms the bulk of the deposit disclosed a beryllium oxide content of 14 percent; the much less abundant golden-brown beryl contains 13.8 percent BeO.

WORK BY BUREAU OF MINES

Investigation of the Beryl Mountain deposit by the Bureau of Mines was started in August 1943 and completed in December 1943. The first step was removal of 130 cubic yards of broken rock, which uncovered the rich shoot in cut No. 1 (fig. 2), and disclosed a structural relation between the beryl zone and the quartz core. In the course of the work, clean beryl fragments totaling nearly 8-1/2 tons were hand-sorted from the broken rock. Within the 400 square feet of beryl zone in the floor of cut No. 1 are 188 square feet of beryl. An additional 25 square feet of beryl in the 250 square feet is exposed in the lower part of the walls of the cut.

To explore for possible downward extension of the rich shoot, a tunnel was driven S. 40° W. for 50 feet, beneath cut No. 1 at an altitude of 1,060 feet. The tunnel followed the somewhat irregular contact of the quartz core but was largely in the quartz-feldspar footwall zone. As the face of the tunnel was entirely in the footwall zone, an 8-foot crosscut was driven from that point southeast to relocate the quartz core. Except for a small crystal found in the northwest wall at 49 feet, no beryl was observed in the tunnel or in the crosscut.

Shallow trenching exposed most of the margin of the quartz in one area. The southwestern end of the quartz core was found to contain a second concentration of beryl, though considerably narrower than that in cut No. 1. The second zone contained a radiate group of beryl crystals 3 feet long.

Cuts 2 and 3 were cleaned for inspection. A third but small concentration of large beryl crystals was exposed at cut No. 3 along the hanging-wall margin of the quartz core. A half dozen large crystals, with feldspar and muscovite, were found, and there was evidence of the removal of other crystals.

No other beryl was found along the outer margin of the quartz core.