

sizeable deposits. Limited, known sources in North and Central America have been confined largely to uneconomical deposits in Guatemala, Arkansas, and California. Usable crystals have been found singly or in very small quantities scattered throughout Central and North America and it is a reasonable geologic assumption that satisfactory sources, as yet undiscovered, may exist in these regions. Continued geologic exploration may be expected to reveal such sources; especially is this true when it is considered that much investigation of this nature remains to be done in some of the more remote or inaccessible localities (e.g., Alaska). Large deposits of piezoelectric grade quartz even in Continental United States may exist and this possibility cannot be dismissed.

Military and civilian officials of the Signal Corps have recognized and discussed the problems covered in the preceding paragraphs during the past several years. An active program on the part of the Signal Corps Engineering Laboratories calls for continuous liaison with the Geological Survey, Bureau of Mines, other Government organizations, including State Surveys, Geological and Mineralogical Societies, Educational Institutions and Mining Organizations. These groups, as well as individuals, are asked to be on the alert for sizeable bodies of radio grade quartz and to advise the Commanding Officer, Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey, of such findings. Signal Corps representatives will examine any North or Central American piezoelectric mineral source localities in coordination with the other interested Government agencies or groups indicated, if warranted. Quartz so located will be tested by the Signal Corps Engineering Laboratories for piezoelectric qualities. These Laboratories would also be interested in information regarding relatively large deposits of crystalline quartz of individual crystal sizes in the range of 30 to 100 grams.

PETROGRAPHY OF A SAMPLE OF BEDROCK FROM A DEEP WELL  
AT ROCKAWAY PARK, LONG ISLAND, NEW YORK<sup>1</sup>

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Further evidence as to the position and character of the bedrock of Long Island has been brought forth as the result of a recent petrographic study of a sample of the bedrock from the drilling of a deep well beneath Rockaway Park.

In 1939, one of two deep wells, Q 1030, drilled by the Department of

<sup>1</sup> Published by permission of the Director of the Geological Survey, United States Department of the Interior.

Water Supply, Gas and Electricity of the City of New York, penetrated something over 70 feet of the bedrock from a depth of about 970 feet below mean sea level at Rockaway Beach Boulevard and Beach 111th Street, Rockaway Park, N. Y.

A solid piece of the rock core from this well between the depths of 1,039 and 1,046 feet was selected for petrographic study.

The rock sample has the general appearance of a medium-grained, even-textured granite in which light-pink and gray feldspars and glassy quartz are discernible to the eye and predominate. There are also small flakes of muscovite, biotite, and other mica-like minerals, a few small red garnets, and brassy cubes of pyrite in very small amounts. Thin coatings of a clay-like substance and iron stains appear in some areas.

A thin section of the rock core was prepared and examined under the petrographic microscope. The rock is granitic in texture, the grains being dominantly 1 to 4 mm. across. The essential constituents are subhedral alkali feldspars and anhedral quartz.

Potash feldspar is the predominant mineral, comprising about 65 per cent of the rock. The grains are commonly subhedral to anhedral, and exhibit twinning. Oligoclase comprises only about 1 per cent of the rock; the grains are small (generally about 1 mm. across), anhedral, and polysynthetically twinned.

Quartz constitutes about 25 per cent of the rock. It appears as irregular grains of various sizes and is commonly interstitial to the feldspars. It is usually clear and exhibits wavy extinction; a few grains contain minute dark inclusions.

The minor minerals comprise about 10 per cent of the rock. The micas muscovite and biotite are both present as small scattered flakes. The biotite is pleochroic in pale brown to green. Small, slender prisms of apatite are present throughout the feldspars; many of the prisms are jagged and deeply embayed. Small, nearly opaque iron-bearing garnets are present; most are anhedral and many are hardly distinguishable because of alteration to a greenish chlorite.

The granite shows slight alterations, probably by deuteric processes and weathering. No evidence of regional metamorphism was found. The relation of this granite to other recognized rock units in the general area is not known.

Acknowledgment is made to the City of New York, Department of Water Supply, Gas and Electricity, which furnished the core samples to the U. S. Geological Survey for this study. An entire suite of samples was examined by the U. S. Geological Survey in connection with the joint ground-water studies being carried out on Long Island with the New York State Water Power and Control Commission.