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FIBROUS QUARTZ FROM RHODE ISLAND

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MOST collections of New England minerals include specimens of a peculiar fibrous variety of quartz from one or more localities in southeastern Massachusetts or Rhode Island. The occurrence of this material at Worcester, Massachusetts, has been described by Professor B. K. Emerson and Dr. Perry,[1] and explained as "originally a prochlorite possibly made fibrous by pressure and is now changed in part to silica by the action of the acids formed on the oxidation of the pyrite." As the occurrences at two localities in Rhode Island which have been studied by the writer appear to be of rather different character and origin from the above, a brief description of them is here presented.

The Carboniferous sedimentary rocks of the Narragansett Basin have suffered a great deal of deformation during their long history, resulting in the changing of the coal deposits, which the strata originally contained, into graphite, which has been mined at the "coal" mine at Portsmouth, R. I., and at Fenner's Ledge, in Cranston, near Providence, R. I. In connection with these metamorphic processes extensive dikes and masses of granite were intruded wherever fissures were opened. Hot solutions from the magmas penetrated for long distances, forming quartz veins of various sizes.

Most of the quartz veins of this kind in Rhode Island carry relatively small amounts of foreign materials in them, which appear as crystals of hornblende, actinolite, epidote, rutile, fluorite or various carbonate or sulfide minerals. Such minerals

[1] Geol. Worcester, Mass., p. 17, 1903; U. S. Geol. Survey Bull. 597, 63, 1917.

usually show little or no regular arrangement within the vein; this is the case in the famous hornblendic quartz from Cumberland, R. I., in which a growth of long slender black hornblende blades, which spread out in all sorts of directions within the cavity, has been followed by an infiltration of quartz, filling in all the spaces between them. But in the case of the quartz of fibrous habit herein described there is a regular arrangement and evident close interrelation of the quartz and the actinolite with which it is associated.

The fibrous quartz veins are usually narrow, but they range in width from 1 or 2 mm. to 15 cm. or more. They occupy fissures extending in various directions thru the Carboniferous slaty shales. The fibrous form of quartz can be observed to grade into massive white vein-quartz, demonstrating its primary origin. The massive portion of the vein is usually free from appreciable amounts of visible impurities, except a little pyrite. The color of the fibrous material ranges from pure white to greenish, due to the admixture of actinolite. The latter is present in all sorts of relative proportions in different veins and portions of the same vein, as shown by the analyses, given below. A portion of the greenish fibrous quartz was ground to flour, and the mineral giving rise to the color separated from the quartz by means of a heavy solution; the green portion showed the properties of an amphibole; its color and characteristic extinction angle identify it in the microscopic section.

In appearance the fibrous quartz much resembles asbestos, for which it might readily be mistaken. Its fibers are generally very slender, only a fraction of a millimeter in diameter, altho at times the structure is columnar and the fibers are coarse, with occasional films of pyrite between them. As in chrysotile asbestos, the fibers lie at right angles to the walls of the cavity; they are also often bent into a graceful double curve in the center of the vein, evidently by a movement of one wall with reference to the other. Portions of the wall rock are often found in the center of the vein, as with chrysotile. The fibers are long and very flexible, but altho they look soft will readily penetrate the skin.

Under the microscope the fibrous quartz is seen to be composed of exceedingly long prismatic quartz crystals lying between minute actinolite prisms whose length in comparison to their thickness is also relatively great; in the latter mineral this is,

of course, a normal habit. The quartz prisms are sometimes forty times as long as they are thick, polarizing as a unit thruout their length. At their ends other crystal units may adjoin them, and form a still longer fiber. The parallel growth of the actinolite has evidently been the chief cause of the elongated development of the quartz prisms.

The writer has made three analyses of this fibrous quartz, just as it comes from the vein, which show clearly the variation in the amount of actinolite from one specimen to another. They are presented in table 1.

TABLE 1

ANALYSES OF FIBROUS QUARTZ

	1	2	3
SiO_2	77.15	94.92	91.83
Al_2O_3	8.72	4.56	1.61
Fe_2O_3	7.68		3.81
MgO	3.96	tr.	1.37
CaO	0.70	tr.	0.80
H_2O	1.40	0.16	0.70
CO_2	—	—	0.50
S (pyrite)	0.52	—	0.12
Sums	100.13	99.64	100.74

1. Greenish, from Fenner's Ledge, Cranston.
2. White, same locality as 1.
3. Greenish, Portsmouth.

Good specimens of this fibrous quartz are available to collectors at Fenner's Ledge, Cranston, in the suburbs of Providence, readily reached by trolley, where quarrying is being carried on to obtain graphite and road material. Fossil ferns and beautiful iridescent limonite films are also obtainable at times in the shales of this quarry. The fibrous quartz from Portsmouth was found on the west side of the island, occurring at the "coal" mine (where excellent fossil ferns are readily procured) and on the hill above the Bristol ferry landing.

POSITION OPEN

The New York Civil Service Commission announces that it will receive applications for the position of mineralogist in the State Museum, Albany. The salary offered is $1,740, and men only are eligible. Applicants should be graduates of a university, college, or technical school and specially trained in the science of mineralogy.