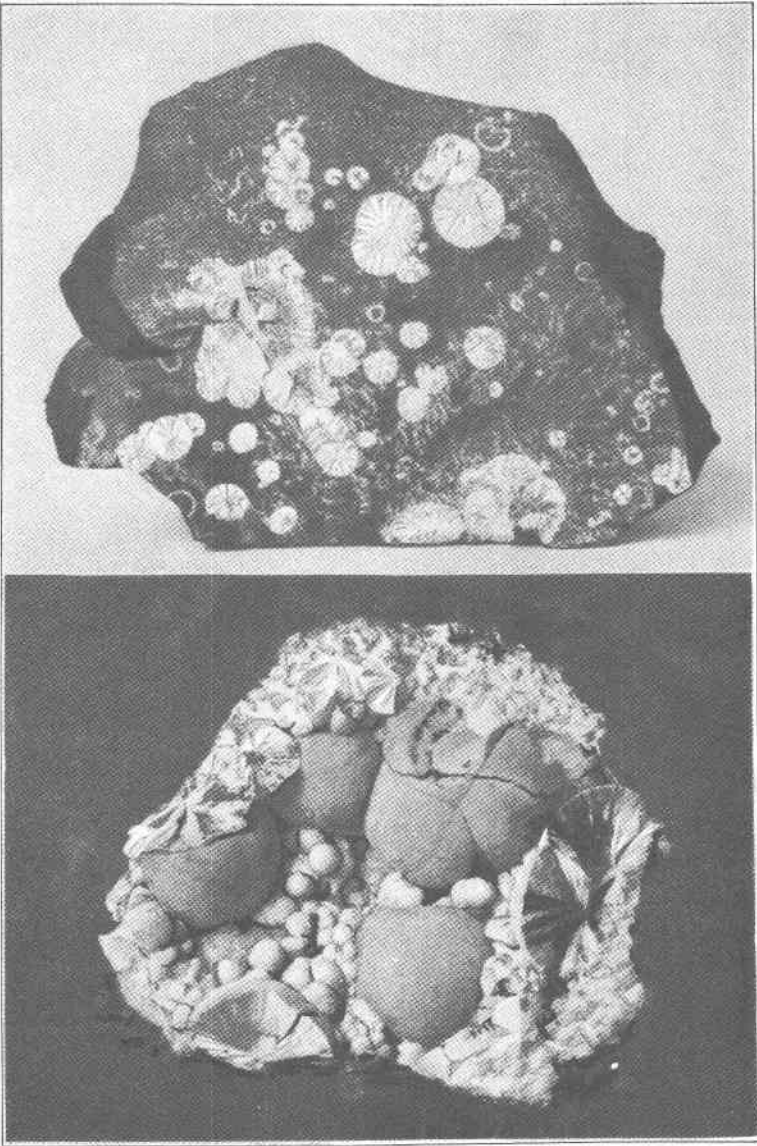


PLATE 6.



( $\times 1/3$ )

PECTOLITE, WEST PATERSON, N. J.

(Radiated Disks and Mammillated)

Florence P. Manchester Memorial Collection, Fall River, Mass.

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## JURUPAITE—A NEW MINERAL

ARTHUR S. EAKLE

*University of California*

The crystalline limestone capping the granodiorite at Crestmore, near Riverside, California, furnishes an excellent illustration of localization in the development of minerals by hydrothermal metamorphism of the limestone, which was originally crystallized by contact with the igneous mass. In this later metamorphism the calcite was recrystallized into large rhombohedral cleavage masses, some having a rich blue color. The localized character of the metamorphism was evidenced by the daily blasting of the quarry face bringing to light bands or zones of blue calcite, each with its distinctive association of minerals. Since most of these interesting associations were in calcite which could be used for cement, they soon disappeared and apparently the same occurrence was not repeated. The blue calcite, xanthophyllite, monticellite, wilkeite, crestmoreite and riversideite, described by the writer<sup>1</sup> were abundant for a short time, but on a visit to the quarry last summer not one of them was found.

The mineral described here and named *jurupaite* after the Jurupa Mountains, of which the Crestmore Hills are a part, is from the Commercial quarry and, like the other minerals of this quarry, probably was abundant but is now represented by one specimen only.

The jurupaite occurs filling a cavity or fissure in a mass of bluish calcite which also contains cinnamon-brown grossularite. It forms compact aggregates of white radiating fibrous spheres of varying sizes, the largest measuring about two centimeters in diameter. The fibers radiate from sharp centers so that sectors of the mineral have needle-like points similar to the pectolite of

<sup>1</sup> Minerals associated with the crystalline limestone at Crestmore, Riverside County, California. *Univ. of Calif. Publications, Bull. Dept. Geol.*, 10, 327, 1917.

Paterson, New Jersey; (compare frontispiece of this number) and the mineral closely resembles this pectolite in other respects. In the center of the specimen a small amount of white chalcedony occurs filling the space between the surfaces of the spheres, and the solutions depositing it have slightly altered the rims of the jurupaite. The fibers are soft and silky without brittleness, but across fibers the hardness is about 4. Specific gravity = 2.75.

The mineral is probably monoclinic. The fibers have oblique extinction, at an angle of  $31^\circ$  to the elongation. The elongation is positive and the mineral is positive. Indices of refraction by immersion are:

Parallel to elongation  $1.576 \pm 0.002$ ; normal to elongation  $1.568 \pm 0.002$ ; double refraction about 0.007.

Jurupaite fuses easily (at 2) to a clear white glass. It is easily soluble in dilute HCl without gelatinization. It gives no color with phenolphthalein. Duplicate analyses of the mineral gave:

|                  | 1.    | 2.    | Mean  | Ratio | Approximate ratio |
|------------------|-------|-------|-------|-------|-------------------|
| SiO <sub>2</sub> | 48.81 | 48.93 | 48.87 | .814  | 2                 |
| CaO              | 38.55 | 38.78 | 38.66 | .690  | } .795            |
| MgO              | 4.38  | 4.01  | 4.19  | .105  |                   |
| H <sub>2</sub> O | 7.84  | 7.94  | 7.89  | .438  | 1                 |
|                  | 99.58 | 99.66 |       |       |                   |

The composition is thus  $2(\text{Ca, Mg})0.2\text{SiO}_2 \cdot \text{H}_2\text{O}$  in which the ratio of  $\text{CaO} : \text{MgO} = 7 : 1$  approximately. Calculated with this ratio the theoretical composition is:

SiO<sub>2</sub> 48.78, CaO 39.83, MgO 4.06, H<sub>2</sub>O 7.32%.

While it is impossible to state that the magnesia occurs simply as a replacement of calcium and may vary in amount, it is believed that it is an integral part of the mineral because of the localized crystallization of the jurupaite.

The water is held tenaciously by the fibers, less than one percent being lost at  $120^\circ$ , the heat of a Bunsen failing to completely dehydrate the mineral. This seems to be true of all the fibrous calcium silicates of the quarry and all of them can be considered as derivatives of orthosilicic acid rather than as simple hydrous metasilicates. The formula proposed for jurupaite is therefore  $\text{H}_2(\text{Ca, Mg})_2\text{Si}_2\text{O}_7$ .

Crestmoreite and riversideite are examples of this localized development in a different zone in the limestone, where the orthosilicic solutions carried the phosphate and sulfate and both minerals may be considered as calcium orthosilicates having

PO<sub>4</sub>, SO<sub>4</sub> and CO<sub>3</sub> as essential constituents included in the molecule.

There is still a great abundance of yellowish green vesuvianite at the quarry, and the granular masses contain seams and veinlets of white, minutely fibrous calcium silicates, showing differences in indices and amount of hydration. They indicate that quite a range of fibrous calcium silicates exist with similar ratios of CaO to SiO<sub>2</sub> and with indices governed by the amount of water present. The new mineral, plazolite, described by Foshag<sup>1</sup> occurred imbedded in these seams and its close similarity to garnet should be noted. In its crystal form, physical properties, high index and anomalous birefringence, and chemical composition the mineral suggests garnet. It lacks but one molecule of SiO<sub>2</sub> to make it a pure calcium garnet, but, on the other hand, contains CO<sub>2</sub> and H<sub>2</sub>O, evolved at high temperature. Instead of a true garnet forming, a hydrated crystallization has taken place, having certain of the characteristics of a garnet.

## TSUNASHIRO WADA

GEORGE F. KUNZ

*New York City.*

By the death of Dr. Tsunashiro Wada, of Tokyo, on December 20, 1920, Japan has lost one of her leading scientific men. His attainments earned for him a wide recognition in America and Europe, and they were duly rewarded in his native land, where he so eminently occupied many of the most important stations in the institutions of geology, mineralogy, mining and metallurgy.

He was born March 15, 1856, at Obama, province of Wakasa, Japan. His studies were pursued at the Imperial University of Tokyo, and in 1875 he was appointed an assistant professor there. In 1878 he entered the service of the Home Department, and in 1880 became its Director. In 1880, also, he became Director of the Imperial Geological Survey of Japan, and delivered lectures in Mineralogy and Lithology at the Imperial University. The Japanese Government chose him as the national representative to the International Geological Congress at Berlin in 1884, and on his way thither he was enabled to visit several American and European countries. On his return to Japan he

<sup>1</sup> Plazolite, a new mineral. *This Journal*, 5, 183, 1920.