Fluorapatite

Of special interest is a small lens-shaped mass of fluorapatite and muscovite mica that lies about ten feet below the vesuvianite lenses and is parallel to them. The fluorapatite occurs in short prismatic crystals replacing the muscovite and ranges from one to five millimeters in width and from three to twelve millimeters in length. The mineral is pale blue to colorless, with a vitreous luster, and is translucent. Under the mercury vapor lamp the mineral displays a strong light orange color. The indices of refraction are: $\omega = 1.632$ and $\epsilon = 1.629$. Birefringence is 0.003.

Summary

From the study of four thin sections, vesuvianite was found to be confined to definite layers. The original calcareous beds have been almost entirely replaced by vesuvianite, orthoclase, epidote, diopside and interstitial calcite. In the quartzitic beds hornblende, biotite, and sphene are present. The vesuvianite and the associated minerals, together with the granitic body close by, suggests a contact metamorphic replacement of a calcareous sandstone.

References

Katz, F. J. Stratigraphy in southwestern Maine and southeastern New Hampshire: *U. S. Geol. Surv., Prof. Paper* **108,** 165–177, (1917).

WORLD DISTRIBUTION OF SERPENTINIZED PERIDOTITES AND ITS GEOLOGIC SIGNIFICANCE*

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The serpentinization of peridotites is considered to be caused by water present in the magma at the time of crystallization. Alteration of peridotites forms biotite, actinolite, chlorite, talc, carbonates, and is considered to be the result of later hydrothermal solutions commonly from granitic intrusions.

The serpentinized peridotites are regarded as products of an ultramafic magma having approximately the composition of the mineral serpentine. Certain other peridotites are undoubtedly formed by crystallization differentiation from basaltic magmas. (Kimberlites, biotite pyroxenites, etc., form a third group of ultramafic igneous rocks which, together with those from basaltic magmas, were not considered in the discussion.)

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Serpentinized peridotites of the type under discussion are related to island-arc structures and lie close to the belt of negative gravity anomalies found in the East and West Indies as well as the Marianne arc of the Pacific. They are also found as long narrow belts along the cores of mountain systems or the roots of old eroded mountain systems, which also presumably went through an island-arc stage. In the West Indies it was found that they were intruded during the first great deformation of the present arc, but did not accompany later deformations. This type of peridotite is never found anywhere but in island arcs or mountain belts as mentioned above.

The serpentine belts of the world were plotted on maps of the continents. Six ages of serpentine intrusion have been noted: Archaean, mid Proterozoic, late Ordovician, Carboniferous, late Jurassic or Lower Cretaceous, and Middle Eocene. Belts of serpentines of each age have a worldwide distribution, and can often be traced uninterruptedly for thousands of miles.

Inasmuch as the serpentine belts lie along the axis of the zones of major deformation of the earth's crust, they perhaps may be used by geologists to unravel the difficult problem of tracing the course of and dating ancient mountain systems. On most continents they show a rudely concentric arrangement, with the oldest at the center, suggesting the building up of the continents from a small central nucleus with the development of successive island arcs around it and the successive fusion of each deformed zone onto the core to increase its size.

BOOK REVIEW

ANGEWANDTE KRISTALLSTRUCTURLEHRE. E. BRANDENBERGER. 208+VII pages, 88 figures. Gebrüder Borntraeger, Berlin; 1938. Price R.M. 12 (paper); R.M. 13.50 (cloth).

This volume is intended to serve as a guide in the use of the International Tables for the Determination of Crystal Structure. The various *x*-ray methods and actual procedures of structure determination are not considered, but rather the geometrical and crystallographic background, including symmetry, translations, point groups, space groups, and use of interference data. For a person beginning work in the field of crystal structure, and who has a good command of German, this book would be very helpful. The advanced worker in this field will find much of an elementary nature, but the subject is thoroughly covered and well presented, and brings together in one volume material which is rather widely scattered in the literature.

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