NOTES AND NEWS

SERENDIBITE AND ASSOCIATED MINERALS FROM THE NEW CITY QUARRY, RIVERSIDE, CALIFORNIA

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OCCURRENCE

The limestone bodies near Riverside, California, have long been famous as mineral localities. At the New City Quarry, two miles south of Riverside, the marble has been invaded by the Bonsall tonalite. Serendibite, a complex calcium, aluminum, magnesium silicate has been recently found among the contact minerals by Professor E. S. Larsen. The mineral has been previously described from Gangapitija, Ceylon, by Coomáráswámy (1) and from Warren County, New York, by Larsen and Schaller (2).

The rock is a grey, coarse grained dolomitic marble. Predazzite, a calcite-brucite mixture, has formed in bands parallel to the bedding as a result of the dissociation of the dolomite. As is common in hydrothermal contact metamorphic rocks, the replacement products are variable. In part they are parallel to the bedding, in part they are less regular. Although the collection made at the quarry represents only a few hours observations, the following minerals, which may be divided into four groups on their general paragenetic relation, were observed in the laboratory.

Thermal	*Early hydrothermal*	*Middle hydrothermal*	*Late hydrothermal*
graphite	allanite	biotite	brucite
magnetite	apatite	hornblende	chlorite
periclase	diopside	microcline	clinozoisite
	grossularite	orthoclase	hydromagnesite
	hedenbergite	plagioclase	limonite
	idocrase	quartz	magnetite
	serendibite	scapolite ($Ma_{49}Me_{51}$)	nontronite
	spinel (pleonaste?)	tremolite	phlogopite
	wollastonite		sericite

SERENDIBITE

Serendibite occurs as a massive granular aggregate in thin irregular replacement bands in the limestone which it replaces incompletely. No crystal forms have been observed. In the hand specimen the color is dark blue with a glossy lustre. It is intimately associated with diopside as an early hydrothermal-contact-metamorphic replacement mineral of the limestone. Plagioclase feldspar, of a late hydrothermal stage, is likewise found associated with serendibite. It varies in composition from andesine to labradorite and replaces the limestone and diopside.

The serendibite is optically positive, and has an axial angle of nearly 90°. The indices of refraction and pleochroism are as follows.

Riverside	New York
$\alpha=1.719$, pale yellow green.	$\alpha=1.701$, very pale yellow green.
$\beta=1.722$, pale blue green.	$\beta=1.703$, nearly colorless.
$\gamma=1.724$, brilliant sky blue.	$\gamma=1.706$, prussian blue.

It is interesting to note that the indices are markedly higher than those of the material reported by Larsen and Schaller from New York. This is probably due to a higher percentage of iron. However, there was not enough of the material available for an analysis. The mineral has an extremely strong dispersion, $r>v$, which causes unusual interference colors and indistinct extinction. It likewise has a low birefringence. Broad polysynthetic twins are common.

Nontronite

A common rock from the quarry is a coarse aggregate of labradorite feldspar and hedenbergite. The pyroxene is in large part altered to nontronite, a greenish yellow earthy mineral having a fibrous or micaceous structure. It is biaxial negative, and has a small axial angle. The indices vary considerably but are about: $\alpha=1.566$, $\beta=1.583$, $\gamma=1.586$. Extinction is generally indistinct because of the fibrous nature of the mineral.

References

(1) Coomáráswámy, A. K., The crystalline limestones of Ceylon: *Quart. Jour. Geol. Soc., London*, **58**, 420–422 (1902).

(2) Larsen, E. S., and Schaller, W. T., Serendibite from Warren County, New York, and its paragenesis: *Am. Mineral.*, **17**, 457–465 (1932).

NEW ACCESSIBILITY OF THOMSONITE BEACH, MINNESOTA

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With the completion of the relocating and hard surfacing of the Minnesota portion of the Lake Superior International Highway (U. S. #61), the Thomsonite Beach zeolite locality on the north shore of Lake Superior in Cook County, Minnesota, is now quickly and easily accessible. It is from this area that the finest and most highly prized specimens of semiprecious thomsonite and allied zeolites have been obtained. In addition to thomsonite, N. H. Winchell[1] identified mesolite, lintonite, and scolecite.

[1] Winchell, N. H., *Minn. Geol. & Nat. Hist. Surv*, Final Report, **5**, 248–251; 405–409 (1900).