

OCCURRENCE OF STILBITE IN THE BORDER CONGLOMERATE  
NEAR CULPEPER, VIRGINIA

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Stilbite has been collected at different times for the past three years from an abandoned road quarry which was opened about 1920 on the southern edge of Culpeper, Virginia, near U. S. Highway 15. Its occurrence is not abundant, but somewhat unusual in this locality, hence this brief note.

The mineral is found in a rock which belongs to the Border Con-

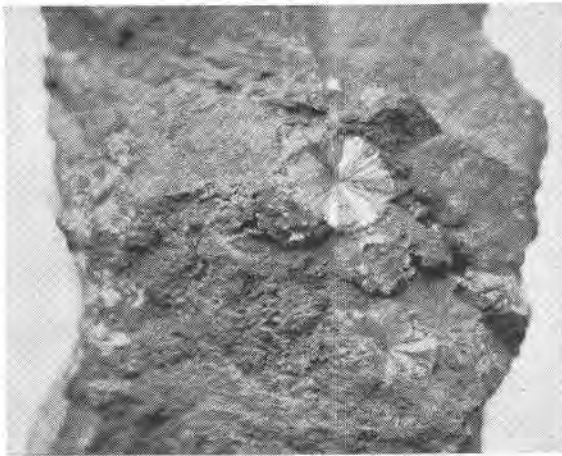


FIG. 1. Stilbite aggregate slightly magnified, Culpeper Quarry, Virginia.

glomerate, described by Roberts in 1928.<sup>1</sup> The entire Triassic series of Virginia, as far as can be determined, is Keuper in age with the Border Conglomerate forming the basal member. This member varies in composition in various parts of Virginia. In the vicinity of Leesburg, the pebbles and boulders are predominantly limestone and are cemented by a calcareous and ferruginous material, while at Culpeper, Raccoon Ford, and in the vicinity of Scottsville the pebbles are, for the most part, reworked Catoclin schist. A large part of most of these pebbles has been altered to epidote. Occasional pebbles of quartz are found in the conglomerate. This member of the Triassic occurs along with red sandstone and shale, and all are intruded by diabase dikes.

The writer identified the zeolite as stilbite, and this has been corroborated by Dr. Clarence S. Ross of the U. S. Geological Survey, who has

<sup>1</sup> Roberts, Joseph K., *Geology of the Virginia Triassic: Va. Geol. Survey, Bull.* 29, pp. 9-24.

kindly furnished information on the indices of refraction and other data. The mineral occurs, for the most part, as incrustations on the pebbles along with calcite, also on the matrix of the rock, and some of it fills cavities in the matrix. Dr. Ross determined the indices of refraction and found them to be:  $\alpha = 1.489$ ,  $\beta = 1.498$ , and  $\gamma = 1.499$ . The double refraction of 0.010 is slightly higher than is ordinarily given for stilbite, but the variation in zeolites probably accounts for this departure. The mineral is optically negative (-) with an axial angle of  $30^\circ \pm 5^\circ$ . It has perfect cleavage on {010} and the acute bisectrix is slightly inclined to the *c*-axis. The mineral is white to light brown in color, and occurs in well formed radiated aggregates. The accompanying figure illustrates the form and approximate size of the zeolite.

So far the only known zeolite in this quarry is stilbite, but apophyllite, chabazite, laumontite, and stilbite have been described from the large diabase quarry on Goose Creek about eight miles southeast of Leesburg, Loudoun County.<sup>2</sup>

In New Jersey, where zeolites have long been known to occur in the diabase intrusives, a greater number of varieties are represented, and have been studied and described at some length.<sup>3</sup>

The origin of the stilbite in the Border Conglomerate is not clear. It is secondary and probably is due to hydrothermal solutions. The nearby diabase intrusions may have been the source of the solutions which deposited the stilbite on and among the pebbles in the conglomerate. Whether or not the Catoclin pebbles themselves played any part in the formation of the mineral is not known.

Grateful acknowledgment is made to Dr. Ross for his kindness in the determination of the optical properties of this zeolite.

<sup>2</sup> Shannon, E. V., The mineralogy and petrology of the intrusive Triassic diabase at Goose Creek, Loudoun County, Virginia: *U. S. Nat. Mus., Proc.*, vol. 66, pp. 71-80, 1925.

<sup>3</sup> Gordon, S. G., A review of the genesis of the zeolite deposits of First Watchung Mountain, New Jersey: *Am. Mineral.* vol. 1, pp. 73-80, 1916.

Schaller, W. T., The crystal cavities of the New Jersey zeolite region: *U. S. Geol. Survey, Bull.* 832, 90 pp., 33 figs., 1932. 32 pls.