THE HIDDENITE OCCURRENCE IN NORTH CAROLINA

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The first discovery of hiddenite was made in 1879 near Stony Point, Alexander County, N. C. Specimens of this emerald green gem mineral, peculiar to North Carolina, were sent by Mr. W. E. Hidden to Dr. J. Lawrence Smith of Louisville, Kentucky, who determined the mineral as spodumene, and gave this variety the name hiddenite in honor of the discoverer.

The property, from which these so-called lithia emeralds were mined, was worked intermittently for some years, and a number of specimens found their way into various mineralogical collections. During the last few months the mine has again been opened up by Mr. W. B. Colburn of Statesville, N. C., who, up to the present, has recovered a large number of museum specimens of hiddenite, together with a number which should cut into beautiful emerald green gems of small size.

Professor Charles Palache of Harvard University and the writer were able, through the kindness of Mr. Colburn, to pay a short visit to the property and collect a suite of typical specimens which will form the basis for a full mineralogical description. The following brief account of the general occurrence may however be of interest, as there are no adequate published descriptions of the deposit.[1]

The Hiddenite mine, as mentioned previously, is situated in Alexander County in the Piedmont belt of North Carolina, about fifteen miles northwest of the town of Statesville. It can be easily reached by automobile from Statesville as its exact location is about one mile beyond Hiddenite postoffice, and about one hundred yards from the main highway between Statesville and Taylorsville.

The red lateritic soil, which represents an almost universal cover of the bedrock in this region, has been stripped off by the open-cut mine work, over an irregular area twenty to fifty feet wide by approximately one hundred and fifty feet long. Where exposed by the open-cut the laterite is from ten to fifteen feet

[1] In *U.S.G.S. Bulletin* 74, Minerals of North Carolina, by F. A. Genth there is a complete list of the minerals found at the Hiddenite Mine.

deep with an astonishingly sharp transition into apparently fresh unweathered bedrock. The open cut has been carried to a maximum depth of about twenty feet in the unaltered rock, which consists of a fine-grained quartz-biotite-garnet gneiss. This gneiss, which probably represents a completely recrystallized argillaceous quartzite of Pre-cambrian age, has been greatly folded, resulting in intense crumpling and contortion. Prior to or during this folding, the gneiss was invaded by solutions, which resulted in the development of numerous lenticular quartz-feldspar pegmatites. These range from paper-thin veins to dikes upwards of a foot in width, and in numerous places the large feldspar individuals are granulated and drawn out into "augen" shapes by the folding. Apparently later than this first lit-par-lit injection were two periods of more complex mineralization, both of which gave rise to the formation of hiddenite. The first of these periods resulted in a number of narrow pegmatites which contain hiddenite crystals in small druses associated with quartz, feldspar, pink manganiferous garnet, biotite, calcite, green chromiferous muscovite, and small crystals of pyrite, rutile, black tourmaline and beryl. This type of pegmatite, or one closely allied to it, also contains hiddenite as hypidiomorphic crystals within the pegmatite itself and not confined to the druses. A characteristic feature of these dikes is an abundance of biotite at the contacts with the enclosing wall rocks.

The hiddenite deposited during this period is twinned on *a* (100), elongated parallel to the *c* axis, and while somewhat tabular parallel to the front pinacoid, shows pronounced development of prismatic forms.

Up to the time of our visit most of the gem material had been obtained from a single large druse, which was found in a dike of this type. Specimens from the wall rock of this druse contained a considerable amount of a peculiar blue lithia-bearing amphibole of the nature of holmquistite.

Following this first hiddenite mineralization a series of shear planes were developed which locally form the site of druses containing hiddenite crystals of two habits. These habits are respectively—thin plates parallel to the front pinacoid with square or rectangular outline; and rather thick tables, shortest in the direction of the vertical axis and with a peculiar deep grooving on the

tabular surface. Because of their twinning these crystals appear strikingly orthorhombic in form.

Associated with these hiddenite crystals are beautiful crystalline developments of dolomite, siderite, quartz, biotite, a complexly twinned mineral which appears to be adularia, pyrite and delicate rutile crystals. The most striking feature of these druses is the manner in which the crystals are implanted on the bare walls of the fissure, without any apparent alteration of the wall rock.

In both types of occurrence solution of the hiddenite crystals has been locally active resulting in partial destruction of the crystals. A number of pseudomorphs of colorless mica after hiddenite were found, and in many places the hiddenite crystals are coated with what appears to be minute scales of chlorite, hitherto called hisingerite. (*cf. U.S.G.S. Bulletin* 74).

The very complex structural history of the rocks containing the deposit, together with the several periods of mineralization, make it difficult to give a concise outline of the series of events which took place during its formation. For this reason, coupled with the shortness of our visit to the property, no speculations as to the source and character of the mineral-bearing solutions will be considered in this short paper.

THE GRANITE OF CONWAY, NEW HAMPSHIRE, AND ITS DRUSE MINERALS

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STATEMENT OF THE PROBLEM

A vertical sheet, in the plane of which numerous miarolytic cavities or druses occur was found in a New Hampshire granite quarry. This quarry, known as the "Redstone Red," is located in Conway Township at Redstone Station, Carroll County. The minerals of these druses offer considerable interest in themselves and a description of their more important features forms a part of this paper. Several of these minerals, however, occur as deuteric minerals in the body of the igneous rock away from this vertical sheet. These deuteric minerals and their probable contemporaneity with the minerals in the druses furnish a very interesting study in the problem of post-consolidation mineral formation.