NOTES AND NEWS

ORIENTATION OF MINERALS IN "AUTOLITHS"

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I have read with great interest the paper by Cornelius S. Hurlbut, Jr., on dark inclusions in a tonalite from Southern California[1] and welcome especially the report of orientation measurements. It is to be hoped that Dr. Hurlbut will soon give us further reports on this work.

About eight years ago. I made some observations on the orientation of minerals in the inclusions in the granitic rocks of the Sierra Nevada. Those observations, made without a universal stage, suggested to me the parallel orientation of minerals in inclusion and host rock which has now been described by Dr. Hurlbut.

A few years ago when a universal stage became available to me, I collected oriented specimens of granitic rocks and inclusions at 9 different localities in the Sierra Nevada; and had prepared from them 25 large oriented thin-sections. To date I have measured 500 plagioclase grains and an equal number of quartz grains in three of these sections. I had intended to make several thousands of measurements, but since the results have been partly anticipated by Dr. Hurlbut, I shall not continue the work.

My measurements show that the (010) faces of the plagioclase of both inclusions and host rock tend to lie parallel to the "direction of streaking" and that the quartz lacks orientation, just as found by Dr. Hurlbut. The orientation of the *a*-axes of plagioclase reported by Dr. Hurlbut is not found in my material, perhaps because of a difference of habit of the feldspars.

It seems certain that the minerals of the "autoliths" must have been subject to the same orienting forces as the minerals of the enclosing rock. The material of the "autoliths" seems still to have been in a sufficiently plastic state for them to be shaped and their minerals to be oriented after they had become separate units within the host rock. Dr. Hurlbut is to be congratulated on having been able to trace the connection of an earlier basic rock with the dark inclusions. I have looked in vain for just this sort of relation in scores of places in the Sierra Nevada.

[1] *Am. Mineral.*, vol. **20**, pp. 609–630, 1935.

ANDALUSITE IN PEGMATITE

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In several pegmatite dikes cutting across the magnesite deposits at Winchester, California (described by Gale and Hess),[1] the writer ob-

[1] Hess, F. L., *U. S. Geol. Survey*, Bull. **355**, pp. 38–39.
Gale, H. S., *U. S. Geol. Survey*, Bull. **540**, p. 516.

served a reddish brown mineral which proved on investigation to be andalusite. Since andalusite is not a common constituent of pegmatites, the occurrence seems worthy of mention and a brief description.

The country rock is a metamorphosed sedimentary series, now a schist, intruded by peridotite, and the whole mass is cut by a number of small pegmatite dikes. The peridotite is almost completely altered to serpentine, with veins of magnesite, while the pegmatites are essentially unaltered. Andalusite occurs in two distinct types of dikes, one dark in color, the other light.

The dark pegmatite is well exposed in one of the quarry pits, and shows clean cut, regular walls against the serpentine. The component minerals are, roughly in order of abundance, as follows: a dirty white to gray plagioclase feldspar, white orthoclase, quartz, black tourmaline, andalusite, biotite, sillimanite, and exceptionally, a grain or two of bright blue cordierite. The gray plagioclase is oligoclase (Ab_8 An_2), frequently filled with poikelitic blebs of quartz. The orthoclase is entirely free from quartz, and occurs in scattered, rather large individuals. Quartz also occurs interstitially to the feldspars. Andalusite appears as square prisms from an eighth to half an inch across, by one to three inches long, or in more irregular masses of varying size. Most of it is nearly opaque, but occasionally the interior of a prism may be perfectly transparent, reddish, green, or even colorless. Andalusite tends to be concentrated along the borders of this dike, with a little perhaps even in the wall rock. Close examination shows the presence of sillimanite more or less completely replacing some of the andalusite grains. Thin sections further confirm this relationship, and show the strong pleochroism of the andalusite, pink to colorless.

While the gray feldspar is dominantly oligoclase, one nearby portion of this dike carries a blue gray, much darker feldspar, and black tourmaline, but no andalusite. This feldspar is andesine (about Ab_3 An_6), which shows both albite and pericline twinning, sometimes in "checkerboard" structure.

In the light colored pegmatite the grain is rather fine, and the mineral association is albite and quartz, in about equal proportions, rather evenly distributed andalusite, and a very small amount of black tourmaline. The andalusite in this locality tends to be paler in color than that in the dark colored dike.

BUSTAMITE FROM INYO COUNTY, CALIFORNIA

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In the course of field work in Saline Valley, Inyo County, California, numerous boulders of a silicate rock containing large irregular patches