are visible, but with crossed nicols (Fig. 3) most of the dahllite appears to have replaced the fossils. It is also noticeable that the larger crystals of dahllite are limited to the borders of the radiolaria.

## Origin

According to Rogers and Kerr,[2] "Dahllite occurs as a secondary mineral in phosphorite or so-called phosphate rock. The usual associate is collophane. The dahllite has probably been formed by the gradual crystallization of the collophane and by the migration of some of the calcium phosphate."

Nothing is known regarding the field relations of these concretions, but conclusions based on this brief study suggest the possibility that the organic remains were replaced by collophane and the dahllite represents a recrystallization of the amorphous calcium carbonate-phosphate.

# A RAPID MICROSCOPIC METHOD FOR DISTINGUISHING QUARTZ FROM UNTWINNED OLIGOCLASE-ANDESINE

Theodore A. Dodge, *Morococha, Peru.*

The distinction between quartz and untwinned oligoclase-andesine in thin section, or powder, is difficult to make, and is a problem not infrequently encountered in petrographical work. The concurrence of the indices of these two minerals makes their separation by means of index liquids impractical. The use of interference colors is untrustworthy. Interference figures, while capable of affording a qualitative answer, can in no way be relied upon to furnish even an approximate quantitative answer without hours of work, and where the number of grains is limited (as in a thin section), or where the grain size is very small, they are useless.

An obvious method for overcoming this difficulty, but one the rapidity and accuracy of which are not generally appreciated, is to be found in the universal stage. Quartz, because of its uniaxial character, when turned to extinction, remains so with a rotation in either the plane of the polarizer or that of the analyzer. Feldspar, being biaxial, in the general case does not. It is only necessary, therefore, to turn the unknown grain to extinction on the inner vertical axis of the universal stage and then make two rotations, one on the north-south horizontal axis, the other on the east-west horizontal axis. If with either of these rotations the grain stays at extinction, it is quartz; if not, it is feldspar.

Some feldspar grains behave like quartz due to a favorable orientation. The number in any given case depends for the most part on the accuracy

[2] Rogers, A. F., and Kerr, P. F., *Thin-Section Mineralogy:* McGraw-Hill, p. 194, **1933.**

of the instrument and the care used by the worker, although grain size may be a factor. Using this method the writer obtained in studying a thin section containing nothing but feldspar (identified by twinning) results indicating the presence of ninety per cent feldspar and ten per cent quartz. Greater care reduced this error to five per cent, but it was found that for ordinary work less care and the application of a ten per cent correction factor served the purpose better.

In the application of this method of distinguishing quartz and untwinned oligoclase-andesine the writer has in any one thin section tested from thirty to sixty grains, depending upon the relative proportions of quartz and feldspar present and the accuracy desired. The time required was from ten to thirty minutes.

No careful checks have been made on the accuracy of the results obtained, but the writer has felt justified in assuming an error of less than ten per cent, and careful work would undoubtedly reduce this considerably.

## AGUILARITE FROM THE COMSTOCK LODE, VIRGINIA CITY, NEVADA

Robert R. Coats, *University of California, Berkeley, California.*

Examination of polished specimens of ores from the Comstock Lode has revealed the presence, hitherto unsuspected, of the silver sulphoselenide, aguilarite. Aguilarite was not recorded by E. S. Bastin[1] in the only previous paper on the ores of the Comstock Lode. It occurs in dark gray, sectile masses, intimately admixed with other minerals, and exhibiting a poor cleavage, visible only in hand specimens. It replaces base metal sulphides and calcite, and is replaced by argentite, electrum, and stephanite.

According to Schneiderhöhn and Ramdohr,[2] aguilarite is an isomorphous mixture of the naumannite and the argentite molecules, and is isometric above 133°C., probably rhombic at usual temperatures. The differences, due to inversion, may explain the variations in properties shown in the columns below. In the first column are listed the properties of aguilarite from the Comstock; in the second, the properties as recorded by Farnham[3]; and in the third column, those of aguilarite as given by Short.[4] In the fourth column those of naumannite are cited as given by

[1] Bastin, E. S., Bonanza ores of the Comstock Lode, Virginia City, Nevada: *Bull.* **735C,** *U. S. Geol. Survey*, 1922.

[2] Schneiderhöhn, H., and Ramdohr, P., *Lehrbuch der Erzmikroskopie*, 2 Band, Berlin, S. 272, **1930.**

[3] Farnham, C. M., *Determination of the Opaque Minerals*, New York. p. 21, **1931.**

[4] Short, M. N., *The Microscopic Determination of the Ore Minerals: Bull.* **825,** *U. S. Geol. Survey*, p. 86.