MICROSCOPIC CHARACTERS OF THE ORE DEPOSITS AND ROCKS OF THE KIRKLAND LAKE DISTRICT, ONTARIO

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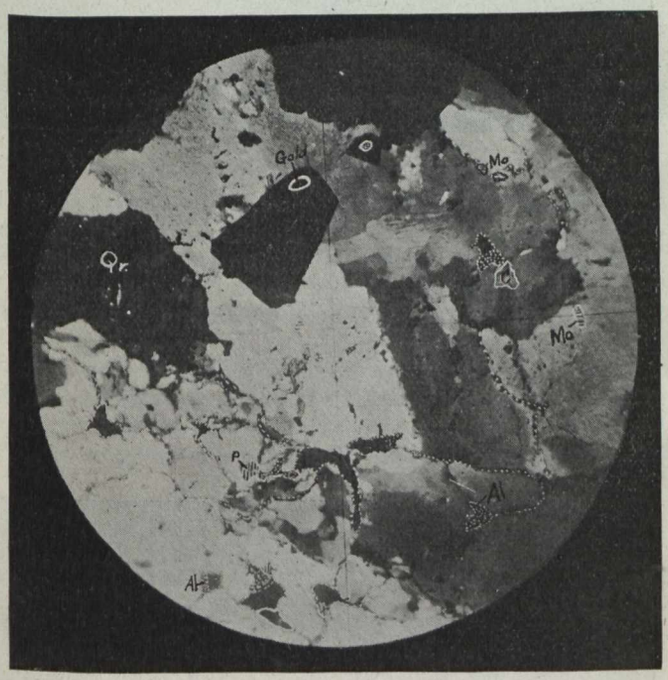
The Kirkland Lake district presents an area of great interest to the petrographer as well as to the geologist. The different types of ore bodies, the occurrence of somewhat rare minerals in those ore bodies, the mode of introduction, and the succession of introduction of the various minerals, all afford a field, unique, somewhat complex, and interesting from many standpoints.

A few photomicrographs will probably serve to illustrate some of the more important features of the ore deposits and rocks of the district.

very fine grained aggregates, forming dark wavy and irregular lines in the quartz (photo No. 2), and also in disseminated particles. In some of the coarser particles the cleavage and the prismatic structure are plainly visible. Some of the thin sections show this mineral to occur quite abundantly, especially in the "porphyry" type of ore deposit, and in the ore at the contact between the porphyry and the sediments. Molybdenite (MoS_2) occurs frequently, and is associated with the pyrargyrite in the dark bands along fractures in the quartz, and also in isolated particles in the



No. 1 x42

No. 2 x42

GOLD ORE, TOUGH-OAKES MINE, KIRKLAND LAKE

Qr. quartz; C. calcite; Al. Altaite; Mo. molybdenite; P. pyrargyrite. White dots represent tellurides.

Photomicrograph No. 1, ore from the 100 ft. level of the Tough-Oakes mine, shows gold and altaite encased in pyrite crystals. In the many fractures in the quartz is shown native gold, and tellurides of lead, zinc, silver and gold. In addition to minerals named in previous papers* may be mentioned, the occurrence of the mineral pyrargyrite, ** ($3\ Ag_2\ S.Sb_2\ S_3$), which occurs quite frequently. This mineral appears in the thin sections as having a greyish black color and rather an adamantine lustre. In thin splinters it shows a deep red color by transmitted light. It occurs in quartz. No argentite was recognized in any of the thin sections examined, and it is probable that pyrargyrite contributes largely to the comparatively high silver values in the Kirkland Lake ores. Occasionally throughout the ore calcite occurs as a secondary mineral.

Photomicrograph No. 2, shows the nature of the dark wavy bands of mineralization, often occurring in the quartz of the deposits. In these bands are found crystallized pyrite, pyrargyrite, molybdenite, and at times the various tellurides and native gold.

*—"Kirkland Lake Gold Deposits," by R. E. Hore, Can. Mining Journal, July 15, 1913, pp. 424-31; "Ore Deposits of Kirkland Lake District," by C. Spearman, Ibid., Oct. 1, 1913, pp. 599-601; "Discussion of Ore Deposits and Geology," by J. B. Tyrrell, J. M. Bell, and A. G. Burrows, Ibid, April 1, 1914, p. 235; "The Tough-Oakes Gold Mine, Kirkland Lake," by R. E. Hore, Ibid, April 15, 1914, p. 259.

**—Several slides made from pannings from typical Kirkland Lake ore showed a few particles of mineral resembling proustite, but being very minute they were difficult to determine.