A few particles of the molybdenite had particles of pyrite and pyrrhotite imbedded in the soft flakes. The ore passing 0.20″ screen was passed to screen delivering product of 0.10″ diameter and finer while the oversize consisting of mica, molybdenite with a few particles of rock weighing 4 lb. in all was removed. The ore reduced to 0.10″ size was passed through a Wetherill magnetic separator removing 134 lbs. of almost pure pyrrhotite as a magnetic product showing by analysis:—

Fe	60.30 per cent.
Sulphur	38 97 "
Nickel	0.34 "
Molybdenum	traces.
Cobalt	traces.
Platinum	traces.
Copper	traces.
Gold	0.04 ounces per ton of ore.
Silver	traces.

The tails from the magnetic separator carry:—

Sulphur	5.49 per cent.
Nickel	traces.
Molybdenum	0.46 "
Copper	traces.
Gold	traces
Silver	traces.
Platinum	traces.

The tails from the magnetic separator passed through a straight line hydraulic separator delivered heads carrying—

Sulphur..... 5.08 p.c. Molybdenum..... 0.34 p.c.

to a Wilfley table while the tails consist largely of mica, crushed particles of rock with a few flakes of molybdenite.

The Wilfley table give a head product weighing 11 lb. carrying—

Sulphur..... 41.93 p.c. Molybdenum..... 1.32 p.c.

being mostly pyrite fit for making sulphuric acid. The middles from the Wilfley samples as being returned to the table for retreatment carry—

Sulphur ..... 3.64 p.c. Molybdenum..... 0.12 p.c.

While the tails carry—

Sulphur..... 2.74 p.c. Molybdenum..... 0.10 p.c.

neither being of any commercial value but showing that the Wilfley table is adapted to the ore for removing the pyrite if it is necessary or profitable to do so. The object of removing the pyrrhotite as one product was to get an ore of nickel if possible but there is not sufficient nickel present to make it worth while so that probably the pyrite and the pyrrhotite might better be separated on the Wilfley as an ore of Sulphur.

Attempts were made to remove the molybdenite from the Magnetic separator tails using a modified form of the Elmore oil process mixing the ore with heavy oil and passing to a spitzkasten where the rock should fall allowing the particles picked up by the oil to float off. The oil seemed to have a selective action on both the pyrite and the molybdenite so that no clean product could be got: besides the larger flakes of molybdenite were not picked up by the oil.

The oversize from the 0.20″ screen was treated in a hand jig calculated to give the same results as a Hartz jig. A sample carrying 55 p.c. molybdenite and 45 p.c. mica gave a product carrying 85 p.c. molybdenite with only a small loss as floating particles in the tails owing to a large size of the particles.

A cleaner separation of a similar sample was obtained by treating in a Wetherill cross-belt separator for weakly magnetic material removing the black mica as a magnetic product leaving molybdenite 90 p.c. pure.

A few flakes of molybdenite go into the magnetic heads owing to imbedded particles of pyrrhorite in the soft molybdenite due to the fine crushing of the rolls. It was found that the inbedded particles of pyrrhotite could be removed by treating in tumbling barrels.

The oversize from 0.10″ screen carrying 48 p.c. molybdenite, 45 p.c. mica with a little horneblende or pyroxene was treated in a hand jig giving a product carrying 70 p.c. molybdenite with a considerable loss as slimes.

Oil concentrating was tried on a similar sample with poor success as the larger particles of molybdenite were not picked up by the oil.

Magnetic separation gave the best results as all the mica was removed leaving molybdenite 91.10 p.c. pure. The same trouble of magnetic pyrites imbedded in the soft molybdenite was noted.

As molybdenite resembles graphite in many physical characteristics it was thought that a scheme of crushing and treating with Hooper pneumatic jigs such as used in treating flake graphite would give a clean product, but unfortunately the writer had not the use of one of these air jigs. Graphite has a specific gravity of 2.1, while that of molybdenite is 4.6 so that in some cases it may be seen that molybdenite cannot be separated clean from some of the associated minerals of the same specific gravity. The makers of the Schule dry concentrator successful on the ordinary run of ores report to the writes that they have not been successful so far in removing molybdenite from a gangue of hornblende and mica.

The following scheme of treatment being the result of experiments is probably the most suitable for this ore:—

Hand cobbed ore.
↓
Jaw crusher (0.50″)—Hand picking of large flakes of molybdenite detached.
↓
Rolls (0.20″)
↓
Screen (0.30″)—→oversize—(mica and molybdenite.)
↓
Screen (0.20″)—→oversize (mica and molybdenite also a little rock.
↓
Screen (0.10″)—→oversize (mica, molybdenite, rock matter.)
↓
Screen (0.05″)—→oversize (mica, molybdenite, rock.)
↓
Wilfley table to save the Pyrite and Pyrrhotite as an ore of Sulphur.

As none of the oversize products from the screens were of commercial grade, experiments were made to ascertain the simplest method of cleaning them.

The oversize from 0.20″ screen was pulverized to pass 0.05″ screen and passed to Wilfley table which delivered a head product

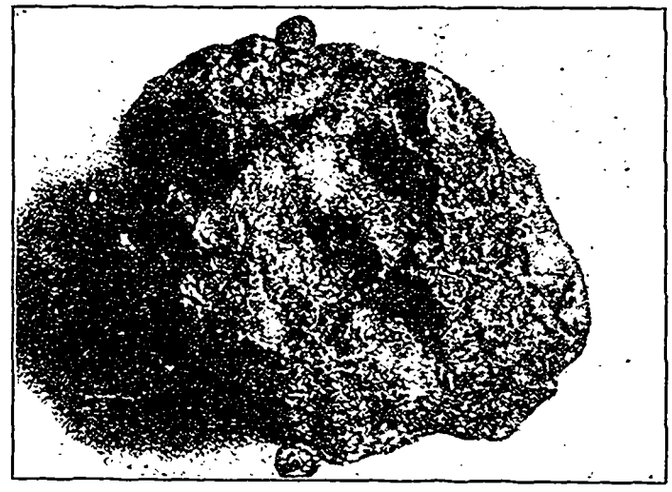

PLATE II.- Showing flakes of Molybdenite (M) in Pyroxene, etc.

assaying 50.4 per cent. Mo and comprising 32 per cent. of the molybdenite in the sample, the remainder escaping into the tails owing to the flaky nature of the ore. Retreatment of the middles from the Wilfley did not yield a clean product so that there will likely be a small loss in treating the oversize products from the screens by the Wilfley which for commercial purposes is probably the best method of cleaning up the oversize products. It is certain that the Hartz jig is not adapted to this purpose. With the object of checking off the results obtained in cleaning up the oversize products by the magnetic