Trip B. Clinton Metallic Paint Company Mine, Brimfield Street, Clinton, N.Y. Proceed to mine by your own transportation. Small groups will be taken underground at regular intervals between 1:30 P.M. and 4:15 P.M.

Owner: Mr. Bruce M. Bare
Mine Foreman: Mr. Robert Barry
In charge of Mine Trip: Mr. Alvin J. Snyder

EVERYONE VISITING THIS MINE MUST SIGN A WAIVER AND GIVE IT TO MR. SNYDER BEFORE GOING UNDERGROUND. PLEASE SHOW DUE RESPECT FOR ALL PROPERTY AT THIS TIME.

The mining of oolitic hematite at Clinton, N.Y. dates back to 1797. Up until the first World War ore was used as a source of iron and the smelting was done locally at Franklin Springs and Kirkland. The Clinton Metallic Paint Company sank its Brimfield Street shaft in 1928. The mining is a modified longwall operation; the ore is hand sorted at the working face and again at the mine head. At the company's plant in Franklin Springs the ore is crushed to pass 325 mesh, bagged, and sold as a paint pigment, coloring agent for cements, and as a casting powder.

There are two principal beds of oolitic hematite in the Clinton Group (see details below and general stratigraphic position in the Table of Silurian Formations, Trip A)

[Diagram of stratigraphic positions showing the layers of the Silurian formation, with labels for the Herkimer formation, Willowvale formation, Saguaite formation, Kirkland "red flux" (dolomitic oolitic hematite), interbedded green shale and limestone, Westmoreland oolitic hematite, and interbedded shale and sandy dolomite.]
The Westmoreland ore is the bed mined at Brimfield Street. Alling (1947) shows that the Westmoreland ore at Clinton, N.Y. consists of a lower one-foot layer of oolitic hematite separated by two feet of "siliceous" rock from an overlying two-foot layer of oolitic hematite. At the Brimfield Street mine this intervening "siliceous rock" or shale parting is generally absent so that the Westmoreland ore bed is about 30 to 36 inches thick and quite homogeneous. The Kirkland "red flux", a low grade dolomitic hematite bed, occurs 18 feet stratigraphically above the Westmoreland ore bed but the former cannot be seen in the encased shaft of the mine.

Sharp upper and lower bedding plane contacts are typical of the Westmoreland ore. Current ripple marks having a wave length of more than one foot are seen along the upper contact of the oolitic hematite at several places in the mine. Oolitic hematite beds in the south branch of Moyer Creek (See Trip A) exhibit well developed crossbedding. Dale (1953) notes the presence of ripple marks and channel fillings in the overlying fossiliferous Willowvale formation, and both he and Alling conclude that the oolitic hematite beds are integral members of a shallow water marine depositional sequence.

The oolitic hematite consists principally of small ellipsoidal concretions or oolites from one to four millimeters in maximum dimension. Each oolite (Alling, 1947) consists of "onion skin" layers of fine grained hematite and chamosite (iron-rich chlorite) surrounding a nucleus of well-rounded quartz, calcite, or hematite. The oolitic ore is dominantly a dull (Tuscan) red with some irregular thin lenses and seams of bright red microcrystalline earthy hematite. Interstitial to the oolites is silica (largely quartz, minor chert), dolomite, calcite, glauconite, pyrite, and francolite apatite. Newland and Hartnagel (1908, p. 62) give the following average chemical analysis for oolitic hematite from the mines at Clinton, N.Y.

\[
\begin{align*}
\text{SiO}_2 & : 12.63 \\
\text{Al}_2\text{O}_3 & : 5.45 \\
\text{Fe}_2\text{O}_3 & : 63.0 \\
\text{MnO} & : .15 \\
\text{CaO} & : 6.2 \\
\text{MgO} & : 2.77 \\
\text{S} & : .23 \\
\text{P}_2\text{O}_5 & : 1.5 \\
\text{CO}_2 & : 6.15 \\
\text{H}_2\text{O} & : 2.77
\end{align*}
\]

Crinoid columnals and tests of brachiopods, cephalopods,
bryozoa, and gastropods, all replaced by hematite, are quite common in the ore. Alling (1947) proposes a diagenetic replacement origin for the ore and summarizes the evidence as follows: 1) they (the ores) are of the bedded type in the strictest sense; 2) they are thin, long lenses, which pinch out and come in again; 3) they are very extensive (oolitic hematite beds of this age occur as far west as Wisconsin and as far south as Alabama); 4) they are associated with sediments of shallow-water origin; 5) they are integral members of a stratified series; 6) they are not the result of replacement long after the deposition and lithification of the rocks, otherwise the ores would be "pockety", and the iron would stain the adjacent rocks; 7) many stages of replacement including replacement of fossil fragments by hematite can be seen in thin section; 8) groundwater played no essential part in the formation of the ore. Alling believes that solutions carrying iron, silica, and alumina were introduced into moderately turbulent, yet clear shallow seas and there precipitated by reaction with carbonates, the marine salts, and possibly by bacteria and oxidation. The oolites may represent precipitation of hematite and chamosite (iron-rich chlorite) from a colloidal state during a period of some agitation of the water.

REFERENCES


Figure C-1

GEOLOGIC MAP OF THE ADIRONDACK MOUNTAINS

KEY TO QUADRANGLES

A3 Alexandria Bay
A4 Theresa
B2 Brier Hill
B3 Hammond
B4 Antwerp
B5 Carthage
C2 Ogdensburg
C3 Gouverneur
C4 Lake Bonaparte
C5 Lowville
C6 Port Leyden
D2 Canton
D3 Russell
D4 Oswego
D5 Number Four
D6 McKeever
E2 Potsdam
E3 Stark
E4 Cranberry Lake
E5 Big Moose
E6 Old Forge
E7 Ohio
E8 Little Falls
F2 Nicholville
F3 Childwold
F4 Tupper Lake
F5 Raquette Lake
F6 West Canada Lakes
F7 Plaice Lake
F8 Lassellville
G1 Malone
G2 Santa Clara
G3 St. Regis
G4 Long Lake
G5 Blue Mountain
G6 Indian Lake
G7 Lake Pleasant
G8 Gloverville
H1 Chateaugay
H2 Loon Lake
H3 Saranac Lake
H4 Santanoni
H5 Newcomb
H6 Thirteenth Lake
H7 Harriburg
H8 Broadalbin
I1 Chazy
I2 Lyon Mountain
I3 Lake Placid
I4 Mt. Marcy
I5 Schroon Lake
I6 North Creek
I7 Husanere
I8 Saratoga
J1 Moores
J2 Daemmora
J3 Ausable Forks
J4 Elizabethtown
J5 Paradox Lake
J6 Bolton
J7 Glens Falls
K1 Willsboro
K2 Port Henry
K3 Ticonderoga
K4 Whitehall
K5 Fort Ann