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The Geology and Ore Deposits of the Ermont Mines

James L. Kelly

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THE GEOLOGY AND ORE DEPOSITS
OF THE ERMONT MINES

by

James L. Kelly

A Thesis
Submitted to the Department of Geology
in Partial Fulfillment of the
Requirements for the Degree of
Bachelor of Science in Geological Engineering

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Butte, Montana
May, 1941
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# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>3</td>
</tr>
<tr>
<td>GENERAL GEOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Cambrian Formations</td>
<td>4</td>
</tr>
<tr>
<td>Flathead quartzite</td>
<td>4</td>
</tr>
<tr>
<td>Wolsey shale</td>
<td>4</td>
</tr>
<tr>
<td>Undifferentiated Cambrian Formations</td>
<td>4</td>
</tr>
<tr>
<td>Devonian Formations</td>
<td>5</td>
</tr>
<tr>
<td>Jefferson limestone</td>
<td>5</td>
</tr>
<tr>
<td>Three Forks shale</td>
<td>6</td>
</tr>
<tr>
<td>Mississippian Formation</td>
<td>6</td>
</tr>
<tr>
<td>Madison limestone</td>
<td>6</td>
</tr>
<tr>
<td>Bench Gravels</td>
<td>6</td>
</tr>
<tr>
<td>Igneous Rock</td>
<td>7</td>
</tr>
<tr>
<td>Andesite Porphyry</td>
<td>7</td>
</tr>
<tr>
<td>Structure</td>
<td>8</td>
</tr>
<tr>
<td>ECONOMIC GEOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>Ore Deposits of No. 19 Mine</td>
<td>9</td>
</tr>
<tr>
<td>Character of the Ore</td>
<td>9</td>
</tr>
<tr>
<td>Character of the Ore Deposit</td>
<td>11</td>
</tr>
<tr>
<td>Ore Deposits of No. 2 Mine and the Open Pit</td>
<td>13</td>
</tr>
<tr>
<td>Character of the Ore</td>
<td>13</td>
</tr>
<tr>
<td>Character of the Ore Deposits</td>
<td>14</td>
</tr>
<tr>
<td>The Relationship of No. 19 and No. 2 Deposits</td>
<td>15</td>
</tr>
<tr>
<td>Other Mineral Occurrences</td>
<td>16</td>
</tr>
</tbody>
</table>
# ILLUSTRATIONS

<table>
<thead>
<tr>
<th>PLATE</th>
<th>IMMEDIATELY PRECEEDING PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Index Map of Beaverhead County, Montana</td>
</tr>
<tr>
<td>2</td>
<td>Surface Views of the Ermont Property</td>
</tr>
<tr>
<td></td>
<td>1. The Ermont mining property as seen approaching from Dillon.</td>
</tr>
<tr>
<td></td>
<td>2. General view of the Ermont mining property.</td>
</tr>
<tr>
<td>3</td>
<td>Stratigraphic Column of the Ermont District</td>
</tr>
<tr>
<td>4</td>
<td>Surface Views of the Ermont Property</td>
</tr>
<tr>
<td></td>
<td>1. The Ermont mill, No. 2 mine and the open pit.</td>
</tr>
<tr>
<td></td>
<td>2. Looking east at No. 19 mine.</td>
</tr>
<tr>
<td>5</td>
<td>Photomicrographs of the Ermont Andesite Porphyry and the Altered Andesite Ore</td>
</tr>
<tr>
<td>6</td>
<td>Ores From No. 2 Mine</td>
</tr>
</tbody>
</table>

GEOLOGIC MAP OF THE ERMONT DISTRICT -- Under the back cover.
INDEX MAP OF BEAVERHEAD COUNTY, MONTANA SHOWING

GEOGRAPHIC POSITION OF THE ERMONT DISTRICT

PLATE 1.
THE GEOLOGY AND ORE DEPOSITS OF THE  
ERMONT MINES  

by  
James L. Kelly  

INTRODUCTION  

The most important gold producers in Beaverhead County, Montana, are the Ermont Mines. They have been worked continuously, with profit for the past six years. The ore deposits are of particular interest in that they lay "at the grass roots" undiscovered for sixty years while in the adjoining areas of Bannack and Argenta many mines were worked to depletion. This general area is the cradle of mining in Montana, having first been mined in the 1860's. These mines have lain undiscovered for two reasons: first, the inconspicuous character of the gold bearing rock, and second, the relatively low gold content.

Practically no detailed information has been published on these mineral deposits. Because of this and the importance of gold mining in Montana the writer has chosen this area for his subject for geologic research at the Montana School of Mines.

The Ermont Mines are located sixteen miles northwest of Dillon, Montana, in section 35 of T.6S., R.11W. This is in the central part of Beaverhead County. They are considered to be in the Argenta mining district, the town of Argenta lying three miles to the northeast.

The property lies at an elevation of 6500 feet above sea level in the low-lying hills between Argenta and Badger Pass. The drainage is southeastward into Rattlesnake Creek and thence into Beaverhead River.
1. The Ermont mining property as seen approaching from Dillon. The relatively mature topography of the district is flanked by mountain ranges. The surface is soil-covered, the detrital material in places being five to ten feet deep.

2. General view of the Ermont mining property looking east. The mill is in the foreground with No. 2 mine and the mine office to the right. No. 19 mine is in the left background.
part low and rolling, covered with sagebrush and grass, and cut by ravines, none of which carry a constant stream of water.

Included in the Emmont property are 34 lode and six placer claims. At the present time mining is confined to three workings; No. 19 mine, No. 2 mine, and the open pit. The mines are named from claim numbers. No. 19 shaft is vertical and the ore bodies of this mine are worked by square set stoping. No. 2 shaft is inclined, the ore bodies being worked by open and square set stoping. All of the ore which is much oxidized, is treated in a 100-ton cyanide mill commonly run to capacity. The open pit, which was the first to produce any large amount of ore, is only 150 feet to the west of No. 2 mine. Both No. 2 mine and the open pit are within 300 feet of the mill and office buildings, but No. 19 mine lies 3,000 feet to the northeast. About 70 men are employed either in the mill or in the mines.

A plane table survey was made of the immediate vicinity of the Emmont mines, in preparing this report, a peep-sight alidade being used and distances being measured by pacing. A Brunton compass was used to measure dips and strikes of strata and auxiliary directions. To accomplish this work the property was visited several times during the fall of 1940, the underground as well as surface workings being examined and samples and specimens to be studied in the laboratory being collected. Both polished surfaces of the sulfide ore, and thin sections of ore and country rock, were studied with the aid of the microscope.

Published information concerning the geology of this area is limited. P. J. Shenon* describes the stratigraphic column in the Er-

mont district and makes note of the Ermont property. Other than this there is no other mention of the Ermont mines in the published literature.

ACKNOWLEDGMENTS

The author wishes to express his appreciation to Mr. B. R. Caswell, superintendent, for his permission to study the Ermont mines; to Mr. C. H. Steele, consulting engineer for information and help concerning the geology of the ore deposits and to Dr. E. S. Perry, head of the geology department for his advice and guidance in the preparation of this report. The author is also indebted to Mr. Walter Bauer, whose collection of ore samples was of great help, and to Mr. Claude Dale for his assistance in surface mapping.

GENERAL GEOLOGY

The sedimentary beds in the immediate vicinity of the Ermont mines are Paleozoic in age, although Mesozoic and Pre-Cambrian strata occur in Beaverhead County. In the area mapped by the author a sequence of formations, composed essentially of limestone, ranging from the Flathead quartzite of Cambrian age to the Madison limestone of Mississippian age, was observed. Intrusion of two sill-like bodies of andesite porphyry into these sedimentary formations and an apparent complete absence of Park shale and Dry Creek sandstone of the Cambrian series makes age correlation difficult. Cambrian limestones between the Wolsey shale of Cambrian age and the base of the Jefferson dolomitic limestone of the Devonian age are shown as undifferentiated. Good exposure of formations in outcrops and the absence of large-scale faulting greatly facilitated the mapping of this area, however, meta-
<table>
<thead>
<tr>
<th>AGE</th>
<th>FORMATION</th>
<th>LITHOLOGY</th>
<th>THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td>Terrace gravel and alluvium.</td>
<td>Grey limestone with chert bands and nodules. Thin-bedded, dark and dense at the base grading upward to light grey crystalline limestone.</td>
<td></td>
</tr>
<tr>
<td>Mississippian</td>
<td>Madison limestone</td>
<td>Thin-bedded shale, laminations up to one inch, green, grey, brown and purplish colors. Band of grey shaly limestone included.</td>
<td>225'</td>
</tr>
<tr>
<td>Devonian</td>
<td>Three Forks shale</td>
<td>Dark green andesite porphyry sill. Phenocrysts of augite and feldspar in a dense groundmass.</td>
<td>80'</td>
</tr>
<tr>
<td>Devonian</td>
<td>Three Forks shale</td>
<td>Shale similar to that above the andesite porphyry sill.</td>
<td>40'</td>
</tr>
<tr>
<td>Devonian</td>
<td>Jefferson limestone</td>
<td>Black magnesium limestone.</td>
<td>370'</td>
</tr>
<tr>
<td>Devonian</td>
<td>Jefferson limestone</td>
<td>Dark green andesite porphyry sill</td>
<td>235'</td>
</tr>
<tr>
<td>Devonian</td>
<td>Jefferson limestone</td>
<td>Dark grey and black sugary limestone. Bed with twig-like bodies in sandy limestone at the base.</td>
<td>380'</td>
</tr>
<tr>
<td>Undifferentiated Cambrian limestones</td>
<td>Light colored limestone. Light grey and pinkish at the base, brownish and dark grey limestone above.</td>
<td>360'</td>
<td></td>
</tr>
<tr>
<td>Cambrian</td>
<td>Wolsey shale</td>
<td>Buff colored, soft crumbly shale. Uneven, irregular lamination planes.</td>
<td>70'</td>
</tr>
<tr>
<td>Cambrian</td>
<td>Flathead quartzite</td>
<td>Brownish-red, dense quartzite, hard and brittle.</td>
<td></td>
</tr>
</tbody>
</table>

PLATE 3.
morphism causes most of the limestones to be difficult to differentiate.

CAMBRIAN FORMATIONS

The Flathead Quartzite. The oldest Paleozoic formation in the area is the Flathead quartzite of middle Cambrian age. It is a pink to brownish red, dense quartzite, very hard and brittle. It displays cross-bedding and is very resistant to erosion. A prominent exposure of Flathead quartzite may be found about half a mile to the northwest of No. 19 shaft, standing out as a ridge of dark red stone.

Wolsey Shale. Evidence of the presence of the Wolsey shale is found only in two prospect pits to the east of the Flathead quartzite ridge. One of these pits cuts the bedding of this shale at a depth of about fifteen feet and a considerable amount of it is thrown up on the dump. It is a dirty yellow to buff color, thinly bedded shale which crumbles easily. There is no evidence of worm tracks so characteristic of this shale elsewhere. Because of its softness it erodes easily and leaves no exposures. Its position is marked by ravines between the Flathead quartzite below and the massive limestone above.

UNDIFFERENTIATED CAMBRIAN FORMATIONS

Above the Wolsey shales is 360 feet of limestone called the Tilden formation by Shenon. It includes a fine grained pinkish limestone above the Wolsey shale, which grades upward into a dense grey limestone, then to a brown sugary limestone and finally to a light grey limestone. The following succession of beds measured in the Ermont district has been assigned by Shenon* to the so-called Tilden formation:

No mention is made of the Wolsey shale.

TILDEN FORMATION

Muddy colored sandy limestone 102 feet
Light grey, then bedded sandy
Limestone which weathers buff 12 "
Massive crystalline, bluish grey sandy limestone 190 "
Fined grained pinkish limestone, weathers tan 10 "
Grey sandy limestone 20 "
Thin bedded, white silicious limestone 12 "
Grey sandy limestone 75 "

Flathead Formation

It is probable that this sequence of strata includes what elsewhere in Montana is known as Meagher, Park, Pilgrim and Dry Creek formations, all of Cambrian age. The writer recognizes this relatively undistinguishable series of limestones, but prefers the use of the term Cambrian undifferentiated.

DEVONIAN FORMATIONS

The Jefferson Limestone. In the Paleozoic limestones in this area there is a definite and sharp change from light colored limestone of the upper Tilden formation to a black magnesium limestone. This black limestone, designated as the lower part of Ermont formation by Shenon, is without doubt the Jefferson limestone, the base of which is marked by this definite lithologic change and also by a band of black, sugary limestone with grey twig-like bodies which normally occurs very near the base. These twig-like bodies are considered to be an indeterminate fossil bryozoan. The Jefferson limestone itself is fine-grained in some horizons and sugary in others, but is always very dark to black in color. A characteristic fetid odor can be detected on fresh fracture.
The Three Forks Formation. Above the Jefferson limestone is a band of thinly bedded shale including a band of bluish grey sandy limestone. The limestone bed crops out prominently, but the shale weathers easily and in this area is exposed only in two short adits and in several prospect holes. The laminations of this shale range up to an inch in thickness. This formation shows a variety of colors, mostly greens, greys and browns. Shenon has grouped the Jefferson limestone and Three Forks shale into one formation which he calls the Ermont Formation. In this series of strata he includes all the beds between the Tilden formation and the Madison limestone. No doubt if Shenon had been mapping a larger area he would have recognized a two-fold division to the Devonian strata.

MISSISSIPPIAN FORMATION

The Madison Limestone. To the east and south of the Ermont mines is a wide exposure of Madison limestone. The Three Forks shale grades upwards into thin-bedded, dense, black limestone which may be considered the base of the Madison. Above this is a great thickness of bluish-grey limestone with chert nodules and bands. Formations above the Madison were not observed in the area mapped.

Bench Gravels. To the northeast and east of the Ermont Mines the formations are covered with bench gravels composed mostly of well rounded, brown quartzite boulders. They lie 50 to 100 feet above present lines of drainage, on flat uplands sloping uniformly away from the mountains to the west. They apparently are alluvial fan deposits which accumulated on an erosion surface immediately preceding the present drainage, and are probably of late Tertiary age.
Andesite Porphyry. The only igneous rock in the area mapped is the andesite porphyry which occurs as sill-like and dike-like bodies intruded into the sedimentary formations. Two main bodies are present but they are irregular in shape and in places small dike-like tongues extend into the limestone. The andesite is not as resistant to erosion as the limestones, and the position of these igneous bodies is marked by depressed erosional features. The smaller of the two sills, intruded into the Three Forks shale, has been eroded as much or even more so than the shale itself. However the presence of the andesite porphyry is marked by an abundance of detrital material occurring as rubble, as well as by definite outcrops and exposures in prospect holes.

The Ermont andesite porphyry is greyish-green on fresh fracture, but very dark green on the weathered surface. A dense ground-mass gives the green color. Imbedded in this groundmass are lath-shaped phenocrysts of feldspar and augite which is altering to chlorite.

In thin section under the microscope, the feldspar and augite phenocrysts are noted to be imbedded in a microcrystalline groundmass composed largely of small lath-shaped feldspars. The groundmass constitutes about one-third of the rock. The plagioclase feldspar is andesine. In places shows considerable alteration but still retains the twinning striae. Orthoclase is less abundant than plagioclase. Many large phenocrysts of augite, most of them being twinned and only slightly altered, are scattered uniformly through the rock. About one-half of the phenocrysts in the porphyry are augite. Some opaque mineral grains were noted and these are probably magnitite. No quartz was found in thin section.
STRUCTURE

The sedimentary beds of the Ermont area lie on the east limb of a broad, open anticline the axis of which strikes nearly north to south and plunges gently to the south. The area mapped includes those beds on the east limb of this anticline. The maximum dip of the beds on the east limb of the anticline is $32^\circ$ while on the nose of the anticline the dip decreases to as little as $14^\circ$. Erosion has cut across this structure exposing all formations down to the Flathead quartzite which is evident as a prominent red hill some 3,000 feet northwest of No. 19 mine. The quartzite forms the backbone of the anticline, and younger formations appear as horse-shoe bands around this exposure of Flathead quartzite. The position of the Wolsley shale is indicated by ravines at the foot of the quartzite hill. Traveling southeastward from the Flathead quartzite outcrop the lower Paleozoic limestones lie conformably on one another and dip uniformly to the east, the entire section being exposed in outcrops at one place or another. On the east limb of the anticline the beds strike about $N.10^\circ W.$ and as they cross the nose of the anticline the strike changes to northeast.

The important and characteristic feature of the area in question are the andesite porphyry intrusions which occur as sill-like and dike-like bodies. The largest of these, which is about 235 feet wide, is intruded into Jefferson limestone and for the most part is conformable to the bedding. However in places off-shoots or tongues of andesite porphyry cut cleanly across the limestone bedding. To the north of No. 19 shaft this igneous body widens considerably and engulfs sections of limestone.

The other andesite porphyry sill, about 80 feet thick, lies to the east of the larger and is intruded into Three Forks shale. It also
1. The Ermont mill. No. 2 inclined shaft is at the right and the open pit is in the foreground.

2. Looking east at No. 19 mine. Note the level soil-covered surface.
lies parallel to the sedimentary bedding. To the east of this smaller andesite porphyry intrusion is a sandy limestone layer in the Three Forks shale above which is more shale grading into basal Madison limestone.

No faulting of any great extent has effected this area, although large scale faulting is common in southwestern Montana. Anticlinal folding was followed by intrusion, and these rocks, once deeply buried, have become exposed by the erosion of several thousand feet of overlying material.

ECONOMIC GEOLOGY

The Ermont mines are producers of gold ore principally. Silver is present but is of no great importance. Gold at the Ermont mines occurs in two types of ores, namely a replaced limestone ore and an altered andesite porphyry ore. Original mineralization no doubt was sulfide in character but the material is now intensely oxidized. Both replaced limestone and altered andesite porphyry is treated together in the cyanide mill with a 90 per cent recovery of the gold content. At present any sulfide ore, some of which is mined from the lower level of No. 19 mine, is shipped away to be treated.

THE ORE DEPOSITS OF NO. 19 MINE

CHARACTER OF THE ORE

The ore of No. 19 mine is a highly altered andesite porphyry. Both oxidized and sulfide ores are present, that below the 400 foot level being sulfide ore and above the 400 foot level oxidized ore. The ore, both sulfide and oxidized, still retains the igneous texture of andesite porphyry, but other than this it has lost the appearance of
PHOTOMICROGRAPHS OF THE ERMONT ANDESITE PORPHYRY AND THE ALTERED ANDESITE PORPHYRY ORE

1. Andesite porphyry showing phenocryst of augite (a) in microcrystalline groundmass. Ordinary light. Magnification 23 times.

2. Andesite porphyry showing phenocrysts of andesine (f), and augite (a). Note lath-shaped feldspars displaying twinning. Polarized light. Magnification 23 times.

3. Altered andesite porphyry ore Dark veinlet is pyrite cut by quartz (q). Groundmass is highly altered. Ordinary light. Magnification 23 times.

4. Altered andesite porphyry ore Dark irregular segregations are pyrite occurring with secondary quartz (q), and calcite (c). Ordinary light. Magnification 23 times.

PLATE 5.
andesite due to intense alteration and mineralization.

The oxidized ore is light brown in color and black manganese oxide stains are not uncommon. The sulfide ore is a light grey color. In general the sulfides are so finely disseminated as not to be visible to the naked eye. However pyrite is sometimes found as crustations and as veinlets in the rock. The pyrite crumbles easily. In the transition zone, between the 400 foot and 500 foot levels, oxidation has proceeded inward from crevices and fractures in the rock giving a center of grey sulfide ore surrounded by a ring of brown oxidized ore.

In thin section, under the microscope, the altered andesite ore is seen to contain a great amount of secondary quartz and calcite. Quartz occurs as small irregular grains scattered throughout the altered groundmass of the original andesite porphyry. It also appears as fillings for minute cracks and crevices. Secondary calcite is also common and seems to have followed the secondary quartz. It fills openings in and around the quartz and pyrite.

The augite of the original andesite porphyry is altered to chlorite and kaolin. Feldspars are altered to aluminum oxides and kaolin, the quantity of which causes difficulty in milling. The abundance of aluminum oxides in the ore makes thickening of the pulp difficult, and a larger thickening capacity than is ordinarily necessary must be used.

Definite amounts of kaolinite, a hydrous aluminum silicate, and halloysite, a silicate of aluminum like kaolinite but containing more water, has been found associated with the altered andesite porphyry. These minerals are the result of the decomposition of the feldspars in the andesite porphyry.

Polished surfaces of the sulfide ore shows pyrite to occur both as irregular segregations disseminated throughout the altered andesite porphyry, and as associated grains with quartz in veinlets running
through the rock. The irregular segregations are seldom visible to
the naked eye. The pyrite, occurring in veinlets with quartz and cal-
cite is cracked and granular and quartz has filled the cracks. These
veinlets in the ore are principally quartz, and the pyrite appears as
minute stringers in the quartz.

The specimens examined gave no clue as to the mode of occurrence
of the gold. Even with the aid of the microscope not the slightest par-
ticle of gold was observed. Crushing and panning of the ore yeilds no
visible free gold. The fact that 75 per cent of the gold goes into cy-
nide solution in the ball mill indicates that the gold is readily li-
berated by grinding and because of its fineness it is easily taken in-
to solution by the cyanide. It is assumed that the gold occurs as
minute particles intimately associated with quartz and pyrite.

CHARACTER OF THE ORE DEPOSIT

No. 19 mine lies about 3,000 feet to the northeast of the Ermont
mill and office buildings. The shaft is vertical with a depth of 500
feet and the ore bodies are worked from five levels at about 100 feet
intervals. At present the production is from the lower levels the up-
per levels having been depleted. The ore is hauled to the mill by
truck. The water problem is acute and it is necessary to pump water
constantly from the 500 foot level. Water enters the mine on the 500
foot level at the rate of 1500 to 1800 gallons per minute. Most of it
coming through openings in the limestone bedding.

The ore deposit of No. 19 mine is vein-like in character although
definite vein walls have not been developed. It lies on the eastern
contact of the large andesite porphyry intrusion and the Jefferson lime-
stone but it is not a contact deposit. A fracture has occurred which
cuts both the andesite porphyry and the limestone and the ore body is a result of mineralization along this fracture. The fracture zone, and likewise the mineralization, does not parallel the andesite-limestone contact.

As stated before the andesite porphyry is intruded into the limestone as a sill-like body more or less parallel to the bedding. The contact metamorphic effects on this limestone are very slight and alteration of the limestone is seldom apparent for more than ten or twelve inches from the actual contact. There is usually about three inches of soft clay gouge between the andesite porphyry and the limestone.

The unusual characteristic of this occurrence is the fact that ore deposition has occurred only in the andesite porphyry. The fracture zone in the Jefferson limestone has been altered and silicified but is barren of gold. In other words the ore shoot lies entirely in the andesite porphyry and the vein in passing from andesite to limestone becomes barren.

The vein is evident at the surface where it cuts the limestone, however it is not apparent in the surface exposures of the andesite porphyry. The outcrop, which extends southeastward from the collar of the shaft, shows as a highly silicified zone several feet wide. The vein is known to extend downward to and below the lowest level which is 500 feet below the surface. The general strike of the ore body is N.35W. with a dip of 75° to 80° S.W.

No. 19 shaft has been sunk to the east of the ore body. The collar is in limestone, but within a short distance it cuts andesite porphyry, then it passes into a band of limestone and then again into andesite porphyry. Likewise the vein cuts through this body of limestone in the andesite porphyry and is here barren.
Where the fracture cuts the andesite porphyry the ore bodies have formed by replacement and mineralization of the andesite porphyry. Cutting lengthwise through the ore bodies is a zone of fracture from which mineralization has extended laterally into the andesite porphyry. In some places it has been effected for as much as fifteen feet from the fracture zone. The width of the fracture zone is from one to three feet.

Oxidation has proceeded to a depth of nearly 500 feet, a change from the oxidized ore to sulfide ore occurring between the 400 and 500 foot levels. It is gradual and is recognized by a color change in the rock, oxidation proceeding inward from cracks and fractures.

THE ORE DEPOSITS OF NO. 2 MINE AND THE OPEN PIT

CHARACTER OF THE ORE

The ore of No. 2 mine and the open pit is replaced limestone. It ranges in color from dark brown to almost pure white, and it is characterized by a combination of brown and buff colors which give a distinctive mottled appearance. An outstanding characteristic of some of this ore is the concentric banding in light and dark brown colors, and for this reason it has often been termed "zebra" ore. Bedding planes and even small scale folding of the original thin-bedded limestone is well preserved. Replacements of limestone by quartz has given this ore a silicified appearance. Pyrite, finely disseminated through the rock has been thoroughly oxidized, and the brown coloration and earthy textures are caused largely by the presence of limonite after pyrite. In some cases silicification has proceeded so far as to completely replace all limestone leaving pure grey quartz and sometimes chert. In other cases iron with this silicification has produced jasper.

The Jefferson limestone has been the limestone effected by this
1. Oxidized ore from No. 2 mine showing mottled effect of brown and white colors. The material is a replaced limestone.

2. Replaced limestone ore from No. 2 mine, one specimen showing concentric banding caused by rhythmic precipitation brought about by weathering. This is often called "zebra" ore.

PLATE 6.
mineralization. The original black magnesium character has been completely changed to the light colored silicified character of the replaced limestone ore. As would be expected in limestone replacement deposits secondary calcite is found in drusy coatings on surfaces in water cavities.

Gold and iron mineralization accompanied silicification. Gold has been deposited in sufficient quantity to make both milling and shipping ore, and although invisible even under the microscope it is probably present as the native metal in fine disseminations.

Associated with the ore bodies of No. 2 mine are small deposits of stibnite which usually occurs in the andesite walls, but which may also occur in the quartz ore. Occurring with the stibnite ore small amounts of yellow antimony oxides produced by weathering. The stibnite, which is massive in character is not present in commercial quantity.

CHARACTER OF THE ORE DEPOSIT

No. 2 Mine. No. 2 mine and the open pit work the same ore deposit. No. 2 mine is below and to the east of the open pit and within 300 feet of the mill and office buildings. Entry is by an inclined shaft through which the ore is hoisted and dumped directly into the mill crusheer bin.

The ore body of this mine is a replacement in the Jefferson limestone and shows definite replacement characteristics. It is irregular in size and shape and grades laterally into barren limestone. The deposit is bounded above and below by andesite porphyry which occurs as two sills. These sills follow the limestone bedding near the surface but turn downward at about 150 feet depth and cut across both the limestone and the ore body. There is evidence of a pushing effect on the limestone where the andesite porphyry comes up across the bedding and
then turns to follow the bedding. In general the ore body follows down
down the dip of the bedding which is about 25° S.E., and in places it is as
much as 40 feet thick.

The two sills are connected by two nearly vertical dikes of andesite,
seven to ten feet thick, which cut across the limestone and ore body. They closely parallel fractures in the limestone and apparently
follow two of these fractures. The sills and dikes of andesite por-
phyry are not gold-bearing, and in place form the hanging and foot
walls of the ore body.

The Open Pit. Of the Ermont mines the open pit was the first to pro-
duce ore, a large amount of ore being shipped from here before the mill
was constructed. At present the open pit is still producing ore. It
is approximately 175 feet long and 100 feet wide and in places it has
been worked to a depth of nearly 50 feet.

The deposit worked by the open pit is above that of No. 2 mine.
Being the same ore body it is also overlain and underlain by barren
andesite porphyry. The ore extends to the surface except for about
three feet of overburden.

THE RELATIONSHIP OF NO. 19 AND NO. 2 DEPOSITS.

The ore deposits of No. 19 mine and No. 2 mine and the open pit
represent two different ages of mineralization. The deposit of No. 2
mine and the open pit is earlier than the No. 19 deposit. Both are
connected with the larger of the two andesite porphyry intrusions which
is the key to their age relationships.

In the case of No. 19 the andesite porphyry was intruded into
the Jefferson limestone followed by fracturing which cut both andesite
porphyry and limestone. Mineralization then occurred along this frac-
ture to form No. 19 vein. Therefore the ore body is later than the
andesite porphyry intrusion. The No. 2 ore body has been cut by the same andesite porphyry intrusion. Here the andesite porphyry has not been affected by mineralization. This ore body is therefore earlier than the intrusion of andesite porphyry and likewise earlier than No. 19 deposit.

Another contrasting feature between the two deposits is the character of mineralization. Mineralization in the case of No. 2 deposit affected the Jefferson limestone while mineralization at No. 19 had no effect on the same limestone. At No. 19 mine only the andesite porphyry was mineralized.

OTHER MINERAL OCCURRENCES

About 900 feet to the west of No. 19 mine is a large, barren silicified limestone vein which cuts across the bedding of the Jefferson limestone and which has an outcrop similar to that of No. 19 vein. This vein has a general strike of N. 33° W. and dips at a steep angle to the southeast. Its outcrop in the limestone may be traced from the western contact of the large andesite porphyry intrusion northwest for a distance of about 1700 feet where it gradually diminishes in size and is finally lost in the limestone. In some places this outcrop is as much as fifteen feet wide and stands three to four feet above the surrounding limestone. The vein roughly parallels No. 19 vein and both dip in the same direction.

Some 1400 feet to the northeast of No. 19 mine is a small deposit of antimony. This deposit, which lies at the surface, has been worked through a pit or glory hole to a depth of about 25 feet. Some of the antimony ore taken from this pit was shipped in 1940, but at the present time no work is being done on this property.
The ore is a yellow and greenish-yellow antimony oxide occurring as a deposit in limestone. These oxides are soft and have a honeycomb structure. Coatings of the oxides have formed on the limestone, and in places a mass of this antimony oxide will be found to have a limestone core. This deposit is about 40 feet from the large barren quartz vein described above. The deposit dips toward the vein, but it is not known if the two are connected at depth.

Mineralization is evident in many places in the area mapped, but these occurrences have been considered either too small or too low in value to warrant development. In most cases they have been prospected by trenches or pits. Most of these minor areas of mineralization are for the most part small silicified fissure zones in the limestone.
GEOLOGIC MAP OF THE ERMONT DISTRICT

EXPLANATION

MISSISSIPPIAN

CAMBRIAN-CDEVONIAN LIMESTONES

DEPOLITIZED CAMBRIAN-DEVONIAN

LIMESTONE

CAMBRIAN

WOSEY SHALE

FLATHEAD QUARTZITE

ANDESITE PORPHYRY

DIP AND STRIKE

VEIN

INTERMITTENT STREAM

SCALE 1" = 500'