Bergvesenet

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Rapportarkivet

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Tittel

Rapams Copper Pyrites Deposits

Forfatter	Dato	År	Bedrift (Oppdragsgiver og/eller oppdragstaker)
Lahti, William	07.08	1913	

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Sel	Oppland		17184	Lillehammer

Fagområde	Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt)
Forekomstbeskrivelse		Rapam Bækkens gang Gamle gRube Rapam-tjernet

Råstoffgruppe	Råstofftype
Malm/metall	Cu, py, po

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Bergverkshistorien og omgivelsene.
Malmårer og impregnasjonssone gis en beskrivelse
Basert på Cu-innholdet sammenlignet med utenlandske forekomster, mener forfatteren at området rettferdiggjør en omfattende undersøkelse av forekomstene

F.B. W. Lathi 1913 Abl.
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RAPAMS COPPER PYRITES DEPOSITS.

Situation. These deposits are situated in the parish of Sell, about 4 kilometres north east of Otta railway station in Gudbrandsdalen, and about 2-3 km. from Sell church, near the new railway beiing constructed from Otta to Romsdalsfjord.

The ore occurences are situated on a mountain plateau 500-590 metres above Otta station, which again is situated 287 metres above the sea level.

The greater part of the area of the deposits is devoid of trees, but immediately beneath, both to the west and north, there are excellent timber forests available.

In the centre of the deposits are the so called Rapam saeter houses. The most of these houses are well built, and could - at least provisionally - be used as winter dwellings. As only a couple of them are occupied in summer there should be accomodation here for some 50 men during the summer months. During the winter a similar number of men, possibly, could dwell in them. By these means, the erection of workmens dwellings during the first period devoted to further exploration is avoided.

The district around Otta and, indeed, the whole of Gudbrandsdalen as well as Romsdalen (which is a continuation of the same valley towards Romsdalen) is one of the most beautiful in natural scenery in Norway. These tracts are visited annually by thousands of tourists from all parts of the world. Their parishes are the oldest in the country, with old-world culture, are closely populated and well cultivated. The soil is exceedingly good when the distanse so far inland is considered. There are good means of obtaining agricultural products in the imidiate neighbourhood, and there are thick forests in the vicinity of the depósits.

Topography. From Otta Station there is a less good driving road to the Rapam saeter houses; it is rather steep in places, but as soon as the deposits which are on the summit of the mountain, are reached the surface becomes fairly even, with larger or smaller knolls. The terrene occupied by the deposits can be best described as a mount-

tain plateau. The sudden mountain break towards Otta station and Bell is not of a nature to hinder the construction of a ropeway from the deposits down to the railway. A ropeway should be the least expensive and the easiest means of transporting the ore to the railway.

Owing to the broken nature of the surface of the deposits exploitation and mining are considerably assisted, as the lodes can with less cost be operated by means of drivages.

Communications: The district, so far as communication is concerned is well favoured. The distance from Christiania to Otta is only about 290 km ( ) a distance which can be covered, in extremely comfortable railway carriages in 7 hours. The distance along the new railway being constructed from Otta Station to Romsdalfjord is about 160 km. At its terminus at Romsdalefjord is one of the best ice-free harbours.

As already mentioned there is a driving road from Otta to the deposits. Those road can at a small cost be so improved, that it can be used as a driving and transport road.

History of the deposits: The deposits have been known for a very long time past, and have in one place (the "Old Mines") been already opened up in ~~XXX~~ three separated places. But nothing further had been done, probably because the deposits were too far away from the sea, and therefore not worth operating owing to the then lack of roads.

The depósits were licensed to the present owner some years ago, but have not been exploited until recently.

Several others finds have been made in the same district, and with the completion of the Romsdal railway busy mining operations will probably take place.

Nature of ore occurence. The area comprised by the deposits is a fairly large one. It can be said that the lodes occur all over for a length of 2 kilometres, and a width of about 1 kilometre.

The country rock is in the main a dark micaschist, but there are also at several places staurolite schists. Nearest to the con-

tents occur also hornblende-chlorite and quartzite schists.

The ore, which in these deposits is practically all copper pyrites, with some little admixture of iron pyrite, occurs chiefly as impregnations in the rock itself, which in the gangue is more or less associated with quartz. Richer sections or shoots of, in a measure, rich copper pyrites also occur here and there.

In a couple of cuttings in the south east portion of the deposits the copper occurs in fairly rich shoots intercalated by layers of kalkspar.

The lodes, broadly speaking, have a N.W. - S.E. strike, and a dip of about 45° - 70° to S.W. Owing however to some thrusting the strike as well as the dip has in some places undergone some directional alteration.

It is difficult to speak with absolute certainty as to the length and width of the lodes, as the cuttings which have hitherto been made at a number of places are, in the main, too small, so that only at those places where the lodes are narrowest has the width been thoroughly intersected. These cuttings have been usually made in the neighbourhood, of the finds, and in places, where the ore could be easily exposed. This without any thought of constituting the length and width of the lodes, but more with a view of "udmaal" or stake out.

The smallest lode together with the zone of impregnation I measured at about 1 metre in width, and at the place where the cutting was most taken up in width I measured the width of the ore at 4.5 metres. I am pretty certain, however, that if the ore at this place was cut right through its width would be about 7 to 8 metres. From what I could see the width of the ores in the deposit varies from between 1 to 10 metres - perhaps 15 metres - possibly even more. As regards the length of the ores I followed a couple for a distance of 50 metres. If one takes the rust zone into consideration then several of these ores should have even a greater extent in deposit.

Whether the ores occur as lode formations or lenticular bodies I should not care to state with certainty, on account of the small amount of work done, but I am inclined to think they are of the latter class.

Nature of the ore. The ore, as already mentioned, is copperpyrites. Ironpyrites, to an immaterial degree, is associated with it.

The deposits are, as stated, impregnation deposits, and are in parts quite rich, but the average copper content of the most part would not be greater than about 1 %, a little more or less. The richer impregnations might contain as much as about 2 % copper. Purer ore shoots also occur occasionally where the copper content would be about 2.5 - 3 %. The above estimates apply only to ore in the lode (gangue).

Three general samples have been taken, which on analysis, show as under:

1. General sample from "Backken load" from ore broken near the surface, 1.79 % Cu.

2. General sample of ore from the west-lying cutting to the east side of lower "Rapam-Kärnot", 1.56 Cu.

3. General sample of ore broken at "Gamle Gruber" 3.75 % Cu. (copper).

Of the ore could be obtained 2 qualities. The one kind, the richer ore, could be sorted to from 3 % to 4 % goods (possibly higher and the remainder, the other kind, could be enriched for easier handling by further processes.

As the explotations hitherto carried on have taken place here and there, near the surface, and at very shallow depths, I am unable as yet to make any asort of estimate as to ore quantities, which should be found here, but I may venture to maintain that all points to there being here, and should be constituted, <u>considerable</u> bodies of ore.

Thorough exploitation should, in the meanwhile, be carried on in order to arrive at positive facts upon which an estimate of the ore reserves could be based. It is of the greatest importance, also, that by means of systematic exploitation the quality of the ores may be arrived at. I am of opinion, that better results may be secured in many places than those hitherto obtained.

Mining and development. As the inclination of the ores is rather steep and the ground particularly favourable for drivages, mining and exploitation should be quite inexpensive, and at certain places, in many case, it should be under the usual prices obtaining at other similar deposits.

At a number of places no pumping or hoisting arrangements are required up to a depth of tens of metres.

The surface is likewise adapted for easy ropeway construction, and the transport of the ore to the railway should be comparatively inexpensive.

Waterpower. As regards waterpower for the several constructions, lighting etc., there is more than sufficient available in a river in the immediate vicinety of the deposits.

Water for a washinghouse can at a small expense be obtained by constructing a small dam in the Rapam stream, which runs alongside the fields.

Exploitation. Hitherto at a number of places, minor cuttings have been made; but I would advise, in order further to exploit the deposits, that these investigations be confined more to depths below the surface, by means of levels and drives. These operations should be so planed as to be of the greatest possible use in future mining operations.

Of course, such exploitations should be conducted by a practical and scientific mining engineer.

S u m m a r y .

Compared with the results af analyse of the average copper content at a number of well-known mines (both before and after sorting) it will be seen that the results of the ore analyses from the "Rapam-Mines" are not bad.

At the Falun Mine (Sweden) the average copper content of the mined rock is 1.25 %, and sorted 2.5-3.0 %.

At the Mannsfield Mines (Germany) the mined rock contains 0.5-

0.6 % Cu, and 0.003 % silver. The sorted ore (smelter ore) 2.5-3.0 % Cu, (copper) and 0.015 silver.

At the wellknown Mines in the State of Michigan, America, such as the Tamarack and Quincy Mines the average content of the mined rock is 2.0 - 2.4 % Cu, and sorted 2.5 - 3.0 % Cu. At the Franklin and Kearsage Mines the average copper content of the mined rock is 0.6 - 0.7 %. At the Rio Tinto Mines (Spain), considered to be of the richest copper and pyrites mines in the world, the average copper content in the mined rock is 2.15 %, and sorted ore 2.3 - 3.0 %. At the Norwegian pyrite mines the average copper content of the mined rock varies from 1.2 - 1.9 %. At Sulitjelma even from 2.2 - 3.0 %.

The greater parts of the worlds copper production is derived from ores of 1.0 - 1.7 % copper, taking the average of the ore in the lode. Deposits with an average copper content of 2.5 - 3.0 % in the lode are considered to be rich. A copper content of about 3.0 - 3.5 % is the usual figure for smelter ore at most of the copper smelteries.

From the above given copper contents of the foreign mines it will be seen that it has been possible to produce copper profitably from a low grade ore during periods when copper prices were low - compared with present prices - and the technical means of dealing with them for less than those at present available. Thus, with the aid of improved methods and better prices, it is more advantageous and profitable to handle low grade ores now than at any time before.

As the lesser amount og exploitation hitherto carried on at the "Repem" deposits has, on the whole, given favorable results, and as the occurance is large, lies in an inhabitated, and thickly forested trest, with good conditions in respect of communication and waterpower etc., and the ground, likewise, favourable for inexpensive operations the property should be of value, and a thorough exploitation of these deposits is therefore particularly well justified.

Kristiania Aug. 7. 1913.

(sd.) W i l l i a m L a h t i
Mining Engineer.