

BLYTHE RIVER AND CUPRONA IRON AREASINTRODUCTION

In connection with an appraisal of the iron deposits in this State, airborne magnetometer surveys were carried out in two stages during 1955 and 1956 by the Bureau of Mineral Resources of an area extending inland from Burnie to 10 miles south of Hampshire. Although the survey revealed a large number of anomalies throughout the area, all but two of these were due to the influence of basalt, which covers the greater part of the surface in this district. The exceptions were the anomalies covering the known magnetite deposits near Hampshire and Highclere.

Following the aeromagnetic survey, the Bureau of Mineral Resources conducted a ground magnetometer survey in the early part of 1957 of the Blythe River and Cuprona hematite areas. In conjunction with this work a geological survey was undertaken by the author, and for this purpose the geophysical grid lines were used as traverses.

The principal object of the geological survey was the production of geological maps and sections for use in the interpretation of the geophysical data.

A geological map, together with a series of sections, covering the Blythe River and Cuprona areas respectively accompany this report. The maps show the outcrops of iron bearing material as determined in a survey carried out by the writer at the time of Nye's report of 1937, with minor additions and corrections from the present survey.

LOCATION AND ACCESS

The deposits extend from the vicinity of Cuprona across the Blythe River valley, about 5 miles inland from its mouth, in the direction of Natone.

Access from the port of Burnie is 10 miles by road to Cuprona on the east side of Blythe River and a similar distance to Natone on the west.

From south to north the iron outcrops occur on the following Crown land and freehold property:-

49M/42, 78 acres	}	Abandoned mineral leases
48M/42, 73 acres		
322P/M, 50 acres		Australian Commonwealth Carbide Co. Ltd., M.L. (C. O'Keefe, Pur.)
50M/42, 40 acres		Abandoned mineral leases

PREVIOUS LITERATURE

The following reports by officers of the Department of Mines refer to the iron deposits:-

Montgomery, A., 1894. Deposit of Iron Ore at the Blythe River. Secretary for Mines Report for 1893-94.

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- Twelvetrees, W.H., 1901. Blythe River Iron Ore Deposit, Secretary for Mines Report for 1900 - 01.
- Twelvetrees, W.H. and Reid, A.M., 1919. The Iron Ore Deposits of Tasmania, Geological Survey Mineral Resources, No. 6, 51 - 63.
- Nye, P.B., 1937. The Blythe River Iron Deposits. Unpublished Report.
- Thomas, D.E. and Henderson, Q.J., 1943. Some Iron Deposits in the Vicinity of Burnie. Unpublished Report.

Reports to the Commonwealth Government

include:-

- Boyd, A.A., C.G. Gibson and G.W. Young, 1919. Report of Experts on the Blythe River Iron Deposits, Burnie, Tasmania, House of Representatives Paper No. 164.
- Woolnough, W.G., (Commonwealth Geologist Adviser,) 1939. Examination of Iron Ore Deposits in Tasmania, 9-11. Unpublished Report.

Private reports made for the Blythe River Iron Mines Ltd. were:-

- Darby, J., 1900 Blythe River Iron Mines.
- Paul, 1912.
- Jasquet, 1912 and 1915.

HISTORY

The iron deposits in the vicinity of Blythe River first came into prominence in 1891 when mineral leases covering the area were acquired by R. Quiggan and W. Jones. The leases were transferred to Blythe River Iron Mines Ltd. about the year 1900 and were finally relinquished by that company in 1926.

In the first few years of its existence this company carried out prospecting works in the form of adits and trenches in an effort to prove the value of the deposits, and also quarried 1,000 tons of ore from the most northerly outcrop for testing. Other works consisted of the survey of a railway route, over a distance of 6½ miles, connecting the deposits with the Government railway line at the mouth of the Blythe River. A limited amount of grading construction was later commenced but the line was not completed.

Following the report in 1900 by J.H. Darby, an iron expert from England, an abortive attempt was made by the company to establish an iron smelting industry in New South Wales or Tasmania with the object of blending iron ore from the former State with that at the Blythe River.

Little more was achieved until 1919 when the company offered the rights of purchase of the property to the Commonwealth Government. At this stage, Boyd, Gibson and Young were appointed by that Government to make an investigation of the deposit to determine (a) by systematic sampling what the general iron content was, (b) what portion

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or portions of the deposit were sufficiently high grade to be classed as workable iron ore, and (c) if there was sufficient of this high grade material to economically justify the outlay necessary for the equipment and working and transporting of the ore to the sea board. After a thorough examination and sampling of the outcrops and underground workings these experts reported that the deposit contained 9,000,000 tons of iron bearing material, but, "the bulk of the deposit is far too siliceous to be considered as an iron ore at the present day, and that the quantity of good ore is too small to be considered of any economic importance."

Nye's 1937 report was made consequent to a submission by J.D. Patterson, who in 1936 had acquired the mineral leases, for assistance from the State Government in the construction of a railway outlet. The conclusions in this report largely confirmed those submitted earlier by Boyd, Gibson and Young.

In 1940 the Australian Commonwealth Carbide Co. Ltd. acquired Lease No. 322P/M of 50 acres at the northern end of the deposits in the vicinity of Cuprona, and during 1940-41 quarried and despatched 2,592 tons of iron ore to its Electrona Works near Snug for the manufacture of ferro-silicon.

#### GENERAL GEOLOGY

The oldest rocks in the district consist of a group of Upper Pre-Cambrian quartzites and phillites. There is a possible correlation between the rocks of this group and that of the so called Carbine Group at Dundas, but until the latter has been defined no such correlation can be attempted. Exposures in the area examined are insufficient to determine the complete structure of these rocks but a series of closely folded, north-east trending, anticlines and synclines is suggested. In the vicinity of the iron bodies these rocks have a general strike of  $35^{\circ}$  with dips to the south-east at  $80^{\circ}$ .

Unconformably overlying the Pre-Cambrian rocks, in the eastern part of the area, is a group of breccia conglomerates with minor beds of thinly banded cherts and quartzites which are referred to the base of the Owen Conglomerates, of Ordovician age. In this locality the rocks strike north-easterly and dip to the south-east at  $30^{\circ}$  to  $50^{\circ}$ .

Exposures of the unconformity do not occur in the area but on the shore line at Sulphur Creek, 4 miles to the north-east, the base of the Owen Conglomerates is seen to rest with marked unconformity on the upturned edges of the Pre-Cambrian strata. The Dundas Group of the Cambrian is therefore missing in this locality.

South of the mapped area, in the valley of Blythe River, the breccia conglomerates pass upwards into normal conglomerate and quartzite members of the Owen Conglomerate formation. These are succeeded by Gordon Limestones which are exposed in the acute bend of Blythe River, 45 chains north-east of the Camena bridge. The Pre-Cambrian and Ordovician rocks are intruded by Devonian granite, the nearest outcrop of which occurs in the beds of small creeks flowing easterly to Blythe River, at  $1\frac{1}{2}$  miles south-west of the area.

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In the Tertiary period extensive flows of basalt covered the older rocks which were exposed over the pre-existing land surface. The Blythe River has since corroded its deep course through the basalt and re-exposed the underlying rocks along the steep slopes of the valley. The basalt extends over the plateau on either side of the river valley and, in the vicinity of the iron deposits, varies in thickness to a maximum of 350 feet.

#### THE IRON DEPOSITS

These are contained in the quartzite members of the Pre-Cambrian sequence. The principal iron mineral present is hematite, and magnetite has not been observed in the field.

The iron deposits are genetically related to the intrusive granites, outcrops of which occur at a distance of  $1\frac{1}{2}$  miles from the deposits. Mineralising solutions containing iron and silica selectively replaced beds of quartzite at scattered points along a NNE trending shear zone, conforming with the general strike of the enclosing rocks. Movement along the shear zone has produced a brecciation of the hematized bodies.

Across the deep valley of Blythe River the deposits outcrop boldly in the form of numerous disconnected lenses which occur at intervals over a distance of 2,100 feet and over a maximum width of 700 feet.

At both the south-western and north-eastern extremities the host rocks are covered by basalt, which attains a maximum thickness of 350 feet to the north-east. In the latter direction the basalt extends on the surface for a distance of 2,000 feet before the quartzites again outcrop, at about 150 feet below the general plateau level. In this locality, to the west of Cuprona, an isolated, north-east trending, iron body outcrops over a length of 1,800 feet. This lense is offset slightly to the west of those in the valley and probably represents either a sub-parallel line of shearing or a faulted portion of the Blythe River zone.

The deposits consist of quartzitic formations containing an irregular distribution of dense hematite and silica. The silica occurs in the form of blebs and veinlets of quartz, together with quartzite and jasper. In places hematite predominates but the amounts vary considerably throughout the deposits.

Where observed the formations dip at a high angle to the south-east in conformity with the host rocks.

The sampling campaign in 1919 indicated that the deposits as a whole are highly siliceous and that only small patches of ore, containing not more than 12% silica, are present. The principal deposit of that order is that contained in the southern half of the lense in the Cuprona area. The only high grade iron ore, as shown by the sampling occurs at the Purple Crag on the south side of Blythe River. However, it has been proved that this does not extend below the surface and that only 12,000 tons of this ore is available.

  
(F. Blake)  
GEOLOGIST

The Director of Mines,  
HOBART.

12th June, 1957