

DEPARTMENT OF MINES
SOUTH AUSTRALIA

ARTIPENA MANGANESE PROSPECTS. MARTINS WELL STATION

Outside Hundreds. County Derby

Mineral Claims 4283 and 4284 - C.H. Kuchol

by

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GEOLOGICAL SURVEY

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<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
64-532	{ Artipena Manganese Prospects, Martin Well Station	F: 60 chains
	{ Sketch map of Southern Portion of M.C. 4284	F: 1 chain

Rept. Bk. 59/18
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D.H. 1914/62

DEPARTMENT OF MINES
SOUTH AUSTRALIA

ARTIPENA MANGANESE PROSPECTS, MARTINS WELL STATION.

CUTSIDE HUNDREDS, COUNTY DORSET

Mineral Claims 4283 and 4284 - C.H. Rachel.

ABSTRACT:

Small deposits of manganite and pyrolusite occur within oolitic Etina limestone (Marinoan) on opposite limbs of a syncline south of Artipena Hill. The ore was probably formed under oxidising conditions by secondary concentration of colloidal solution derived from disseminated sedimentary manganese.

INTRODUCTION:

The two prospects were examined on 23rd May, 1964, in company with the claimholder. Samples of ore were collected and submitted for petrological examination as well as chemical and spectrographic analyses. Results are tabulated in appendices to this report.

LOCATION AND ACCESS:

Artipena Hut is 9 miles by road south of east from Martins Well Head Station. Mineral claim 4283 lies half way between the hut and Artipena Hill and is about $\frac{1}{2}$ mile north of Wilpena Creek. M.C. 4284 is 6 miles south-west of the hut (See Plan 64-532).

Roads shown are of gravel and dirt, and are in reasonable condition in fair weather. It is possible to drive to both prospects in a Landrover-type vehicle. M.C. 4283 can best be approached by turning south off the road to Martins Well, about $2\frac{1}{2}$ miles north-west of Artipena Hut, and by driving along the grain of the country rocks. M.C. 4282 may be reached by following the station road past the bore south of Artipena Hut and by striking across country from a point south of the prospect.

GEOLOGY:

The country rocks in the district are of Upper Proterozoic age and are assigned to the Marinoan Series, the uppermost division

of the Adelaide System. They form part of the Unberatana Group and are a variable succession of siltstones (often calcareous or dolomitic), sandstones and greywacke with thin bedded dolomites and limestones. A more massive development of limestone (See Plan 64-592) is referred to the Etina Formation (C. R. Falgarno, pers. comm.). Some bands are oolitic and pisolitic, and the limestone gives off a fetid odour when struck. It is noteworthy that the manganese deposits appear to be associated with this variety of limestone on both sides of the syncline; for example on N.C. 4283 on the northern limb, and N.C. 4284 on the southern.

The formations have been folded into a faulted synclinal structure trending approximately east-west, with a gentle plunge eastwards.

PROSPECTS:

N.C. 4283 (12 x 8 chains)

The claim extends across a low craggy ridge of limestone trending north-westerly and sloping northwards down into a gravel covered flat. The beds strike south-west and dip south-east at about 20° . The lowest beds exposed consist of hard massive laminated grey oolitic limestone at least 10 ft. to 12 ft. thick, overlain by fine dense grey and dark grey limestone.

The manganese ore is most abundant in the lower, oolitic limestone, but is not confined to that horizon. It occurs in the form of numerous small irregular pods or scattered lens-like masses within the limestone, the largest of which is about 20 ft. long and 3 ft. thick. The ore is principally manganite (hydrrous manganese oxide) and pyrolusite (manganese dioxide) (See Appendix I, P58166), and is very variable in composition and texture. In places, the ore has a slaggy gossanous appearance, and it is also present as dense black mammillated masses. Some detrital ore has been cemented by kunkar into a manganiferous breccia. A thin fissure vein of manganese oxide about $\frac{1}{2}$ " wide was noted cutting the limestone, striking south with an easterly dip of 75° .

M.C. 4284 (5 x 8 chains)

Mineralisation has taken place on a low craggy dissected limestone ridge immediately north of the southern boundary of the claim. At the eastern end of the ridge there are scattered fallen blocks of black ore with a brecciated appearance. To the west, in the south centre of the property, a tabular lens of pyrolusite and manganite is exposed for about 15 yards along the strike of the oolitic limestone. The ore reaches a maximum thickness of 4 ft. at its western end, tapering to about 1 ft. at the eastern end, and it appears to have been emplaced along a fracture plane parallel with the strike of the limestone, but dipping south across the bedding at 80° . Further west, rubbly manganese ore is exposed for about 18 yds. About 11 yds. north of the south-west peg, a band of sandstone 3 ft. thick is exposed, the upper part of which has been impregnated with manganese oxide along joints. (See Appendix I, TS 14122). Small outcrops of similar permeated sandstone were also noted a few feet above.

There is a small weathered outcrop of wad in the creek, about 40 yds. downstream from the south-east peg of the claim.

OTHER MINERALISATION:

About 1892, the Mammoth Black Ridge mine was opened up, 2 miles south-east of M.C. 4284. A shaft was sunk to 90 ft. on the west side of a large mass of siliceous ironstone with malachite (green copper carbonate) and a crosscut was put in eastwards (Brown, 1908, p.78). The prospect appears to be of little economic interest.

Veins of barytes have been worked intermittently on a small scale north of M.C. 4284 and the Mammoth Black Ridge mine.

ORIGIN OF THE MANGANESE ORE:

Its association with the limestone, particularly the oolitic facies, suggests that the manganese was originally syngenetic, and was probably deposited in the form of disseminated carbonate and oxide in shallow water. It was subsequently con-

concentrated and redeposited under oxidizing conditions from colloidal solutions as manganite and pyrolusite, which permeated the host rocks by way of fracture or joint planes.

(vide Lindgren, 1928 pp. 314-316, 382-384, and Appendix I, TS 14122).

RESERVES AND GRADE OF ORE:

Ore would bulk about 11 cubic feet per long ton. Owing to the scattered distribution of the small lenses in M.C. 4283, reserves are difficult to assess. However, visible ore to a depth of approximately 15 ft. is unlikely to exceed about 100 tons containing 23.9% Mn (Appendix II, A2112/64). It is estimated that to a similar depth on M.C. 4284, there are not more than about 150 tons of ore assaying 35.6% Mn (Appendix II, A2113/64).

As the ore would have to be upgraded to at least 46% Mn, reserves on the two claims examined are too low to be worked economically unless other, more substantial deposits were found in the vicinity.

GEOCHEMICAL ANOMALIES:

The samples from the two claims were also submitted for spectrographic analysis, and results are shown in Appendix II. Sample A2112/64 taken from M.C. 4283 carries anomalous values for copper, zinc, cobalt, barium, lithium, titanium and strontium. No minerals bearing these elements were reported in mineralographic descriptions given in Appendix I, so it is assumed that they are intimately associated with the manganese minerals.

CONCLUSIONS AND RECOMMENDATIONS:

Manganese ore deposits within Stina limestone of Marinean age on M.C. 4283 and M.C. 4284 are too small and are of too low a grade to be worked economically. In view of the association of the ore with this horizon, the claimholder is advised to prospect along the outcrop of the limestone, west from M.C. 4283 and east from M.C. 4284.

Geochemical anomalies invite future investigation of manganese ore and also of the Stina limestone, particularly for copper and cobalt.



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AMM:FM
27.7.64

REFERENCES:

- Brown, H.Y.L., 1928 - Record of the Mines of South Australia
(Fourth edⁿ.) Govt. Printer, Adelaide.
- Lindgren, V., 1928 - Mineral Deposits. (Third edⁿ.)
McGraw-Hill, New York.

APPENDIX I

MINERAGRAPHIC AND PETROLOGICAL DESCRIPTION

Report by Australian Mineral Development Laboratories

Reference: P224/64 to P226/64

Material: Ore and rock samples

Locality: Artipona manganese prospect, Martins Well Station.

Date Received: 29.5.64

Work Required: Mineragraphic and petrological examination.

P224/64: HB110/64: P38166

The principal ore in this sample consists of coarse colloform fibrous aggregates of manganite. Forming a narrow rim to these spheroidal masses are pyrolusite-bearing veins. The pyrolusite occurs as tabular crystals showing a distinct yellow-white birefringence.

P225/64: HB111/64: P38167

This specimen also consists of manganite and pyrolusite, but the latter mineral is dominant. Three types of textures are present:

1. A "concertina" - like structure made up of bent tabular strips of pyrolusite intergrown with minor manganite.
2. Pyrolusite coatings to gangue detrital quartz which often has a perfect form.
3. Shapeless areas of very fine fibrous ?pyrolusite.

Manganese oxide has apparently cemented the detrital grains.

P226/64: HB112/64: TS14122

This is a compact orthoquartzite, composed principally of sub-rounded to sub-angular quartz grains, with a grain size range of 0.15 to 0.10 mm. Zircon, sphene and rounded tourmaline are present as accessories, together with minor muscovite. Opaque manganese ore has permeated up jointing in the sandstone and hence along the rough current bedding planes to give sporadically distributed ore, in voids and as coatings to the quartz.

Appendix I

Investigation and Report by: R. TOWNEND

Officer-in-Charge, Mineralogy Section: H. V. FANDER

29.6.64

L. WALLACE COPPER,
Director.

APPENDIX II

ANALYSES OF MANGANESE ORE

Report by Australian Mineral Development Laboratories.

Reference: A2112/64 and A2113/64
Material: Manganese ore samples
Locality: Artipema manganese prospect, Martins Well Station.
Willippa Run 1/8768 and Run 2/8749.
(G.H. Kuchel. M.C. 4283 and M.C. 4284).

Date Received: 29.5.64

Work Required: Analyses

Assays

Mark	% Manganese
A2112/64	23.9
A2113/64	35.6

Spectrographic Analyses

	A2112/64	A2113/64
	Parts per million	
Copper (Cu)	2,500	25
Lead (Pb)	15	15
Zinc (Zn)	2,000	80
Cobalt (Co)	4,000	400
Silver (Ag)	1	0.1
Gold (Au)	x 3	x 3
Barium (Ba)	2,000	10,000
Lithium (Li)	4,000	400
Titanium (Ti)	3,000	500
Vanadium (V)	10	20
Zirconium (Zr)	150	50
Strontium (Sr)	1,000	2,000
Rubidium (Rb)	200	80

x Indicates "less than."

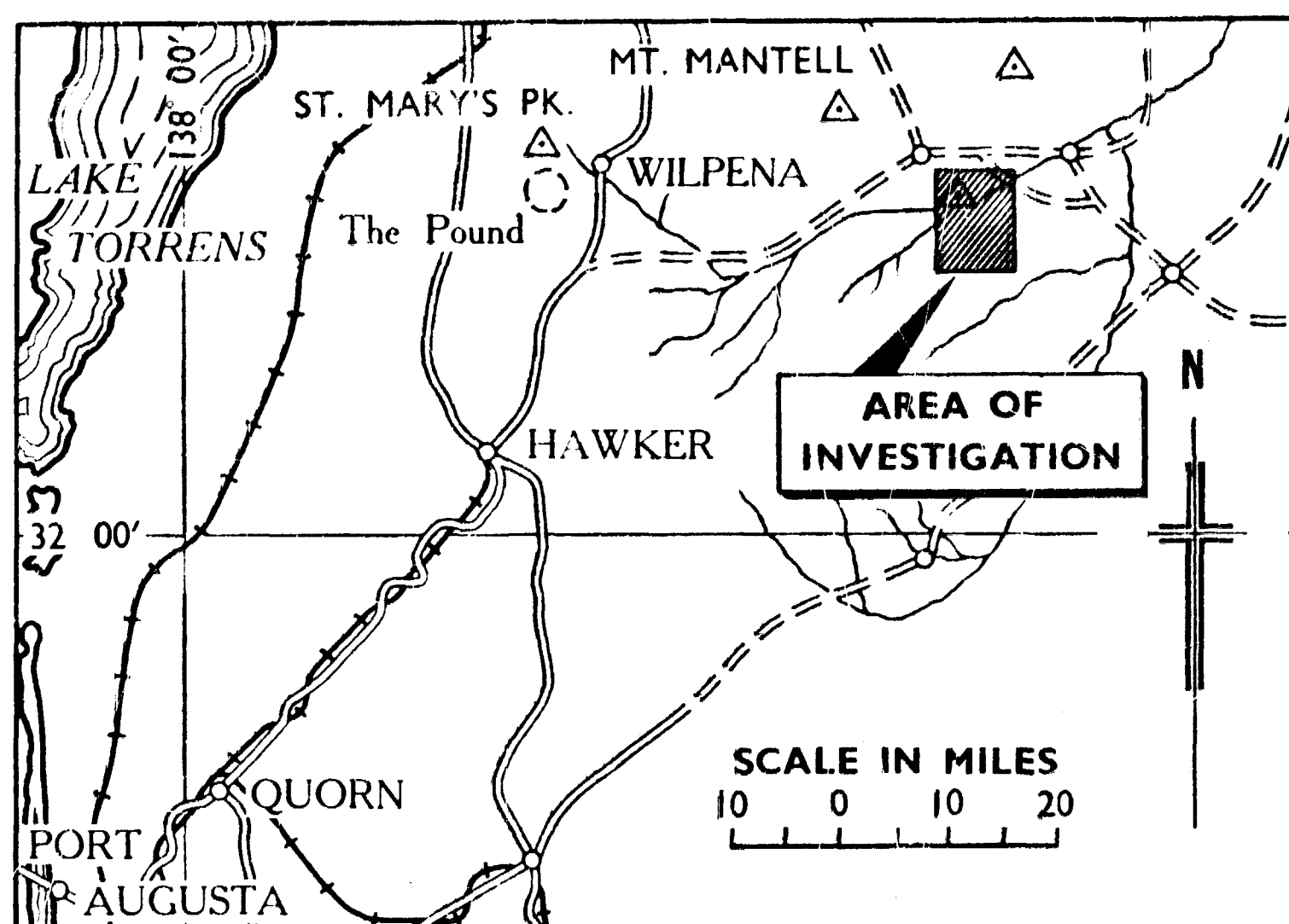
Analysis by: D. McPHARLIN

Spectrographic Analysis by: A.B. TIMMS

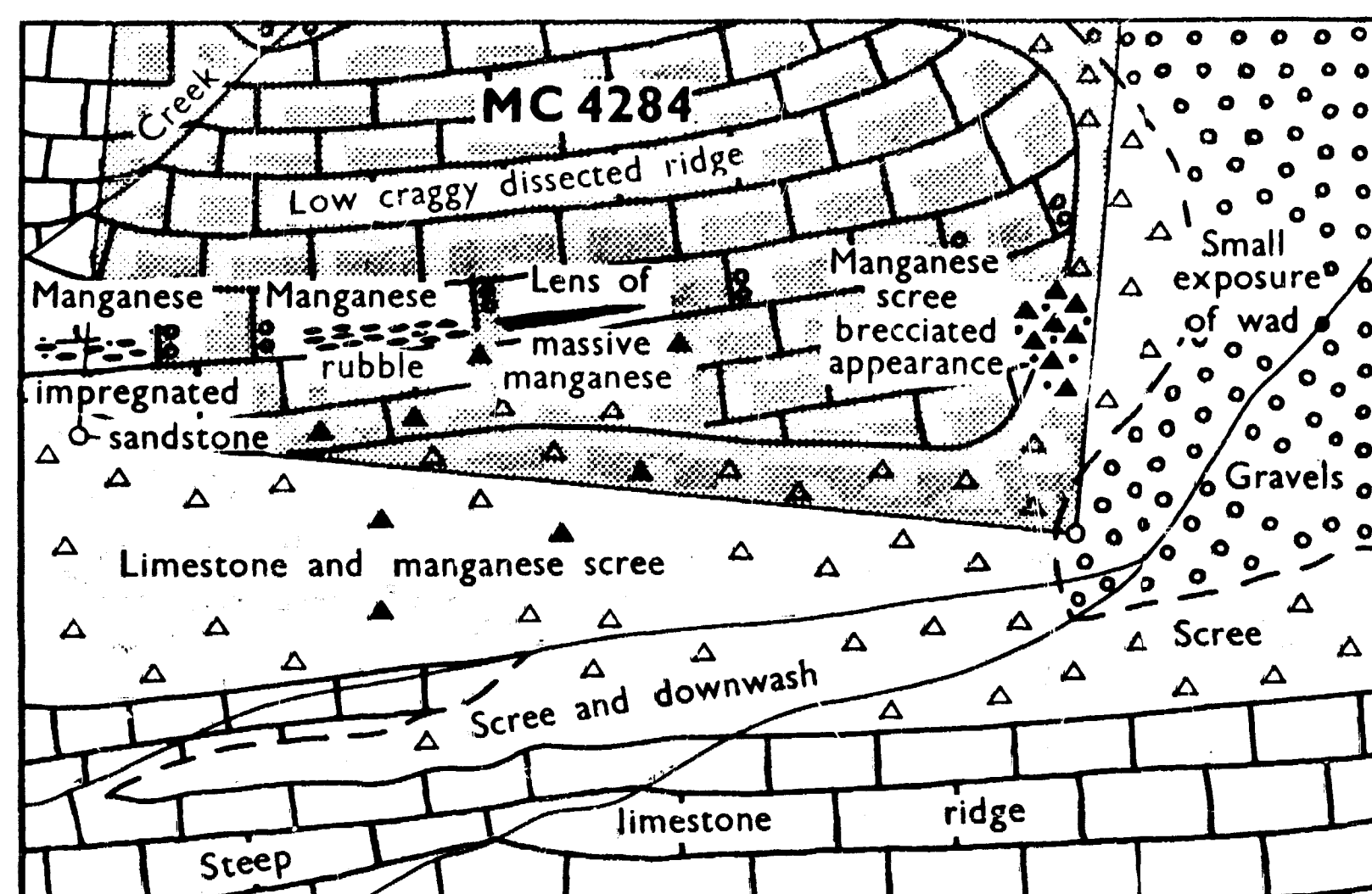
Officer-in-charge, Analytical Section: T.R. FROST

L. WALLACE COFFER, Director.

LOCALITY MAP



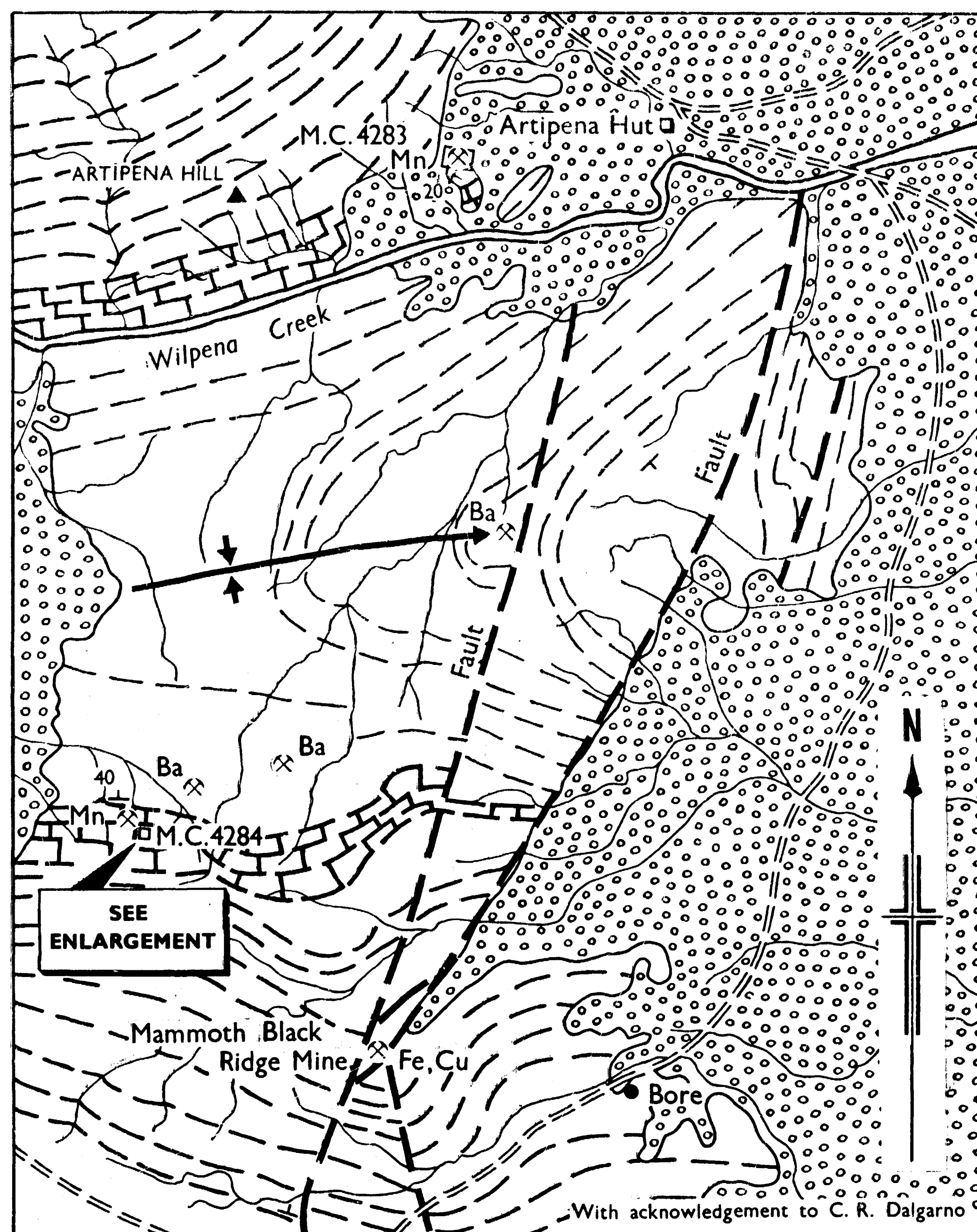
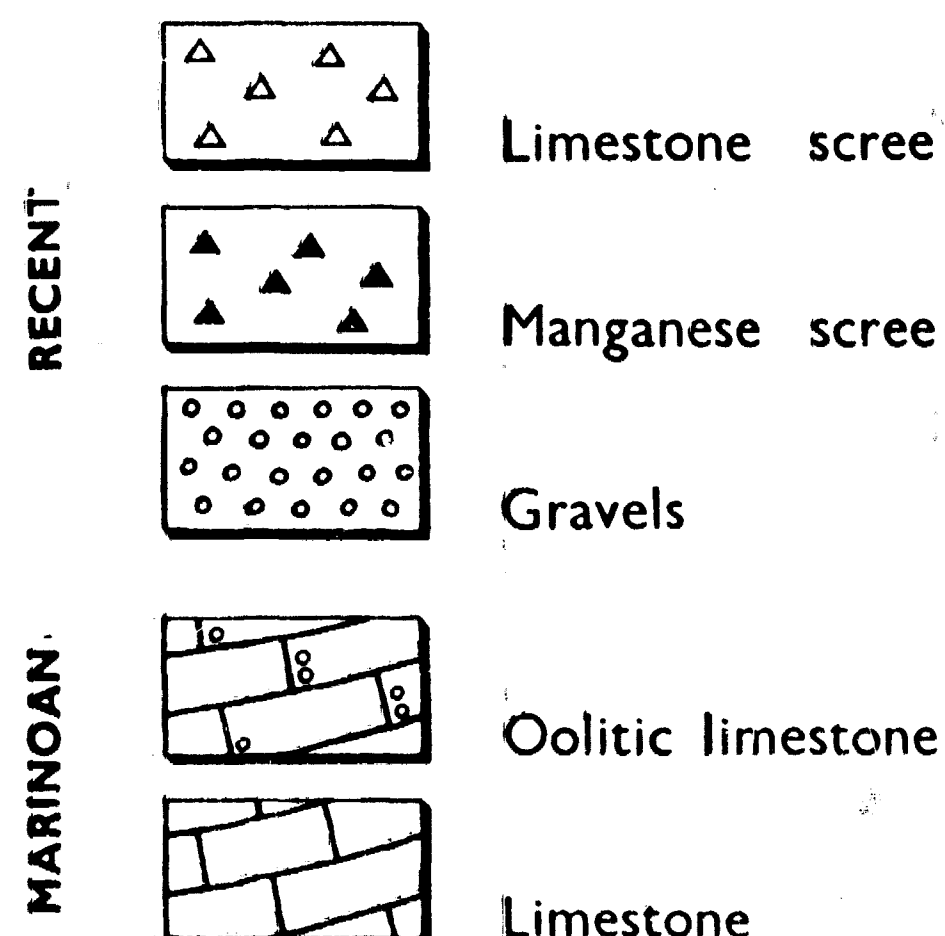
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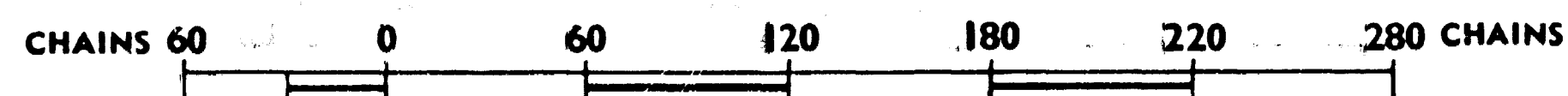
SCALE



LEGEND



SCALE



LEGEND

