COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1959/102

THE OCCURRENCE OF SEDIMENTARY IRON IN THE DULCIE RANGE, NORTHERN TERRITORY

by

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INTRODUCTION

In 1957 the Jervois Range Field Party (K.G. Smith, J.W.Smith, D.R.G. Woolley and J.M. Pulley) of the Bureau of Mineral Resources, Geology and Geophysics, began to map the geology of the Huckitta four-mile area, Northern Territory. Whilst on a visit of inspection to this field party, M.A. Condon observed oolitic ironstone beds in the scarp of the Dulcie Range near Point Spring. A small number of specimens from this and other localities nearby were compared visually with iron ores from the Constance Range, Queensland. These specimens from the Dulcie Range were of lower grade than those of the Constance Range deposits.

The Dulcie Range and the formation containing the ironstone beds were mapped in detail by the 1958 Jervois Range Field Party (K.G. Smith, K. Gough, R.R. Vine and D.R.G. Woolley) and additional specimens were collected from the ironstone beds. These beds were observed at several localities between Point Spring and Mt. Ultim, i.e., over a distance of about 35 miles.

LOCATION AND ACCESS

The general location and the nearest railheads, at Alice Springs, N.T., and Dajarra, Qld., are shown in Fig. 1. The area is served by dry-weather roads to Dajarra and to the bitumen-surfaced Stuart Highway at a point 37 miles north of Alice Springs. Fig.2 shows the major roads in the area. These are all formed, earth-surfaced roads and they are usually impassable for several days after heavy rain.

GEOLOGY

The ironstone beds occur in Cambro-Ordovician beds (mapped by Smith, Vine and Woolley, Records 1959/). The age of the beds ranges from Upper Cambrian to Middle Ordovician; the beds are overlain unconformably by the Dulcie Sandstone (Joklik, 1955; redefined by Smith, Vine and Woolley, 1959) of Upper Devonian age (Smith and Hills, 1959).

The ironstone beds occur only in the upper 400 feet which is of Middle Ordovician age. This upper part of the Cambro-Ordovician beds is not represented along the north-eastern slopes of the Dulcie Range because it had been eroded from that locality prior to the deposition of the Dulcie Sandstone.

Usually, outcrop in the scarp of the Dulcie Range is poor because of a cover of scree. The scarps are usually steep (about 60 degrees) and the ironstone beds are observed usually in the numerous shallow gullies which drain the scarps. In outcrops the ironstone beds have a red colour which varies considerably with variation of iron content.

The lower part of the Cambro-Ordovician beds does not crop out (except on the north-eastern side of the Dulcie Range) in the slopes immediately beneath the Dulcie Sandstone. Plate 1 shows the extent of the upper part of the Cambro-Ordovician beds and the localities in them where ironstone beds have been recorded; in some places the ironstone beds are oolitic; in others they consist of a ferruginous sandstone to which the rounded sand grains give an oolitic appearance.

In the type section of the beds the interval between 592 feet and 765 feet above the base contains several beds of "ironstone". This section was measured in the Point Spring area and at this locality the interval, in descending order, consists of:

250 feet of the Cambro-Ordovician beds overlying

½ foot of dark red ferruginous sandstone;
49 feet concealed;
1 foot of green mudstone; fossiliferous;
2 feet of dark red ferruginous sandstone;
20 feet of poorly-outcropping green mudstone; fossiliferous;
2 feet of greenish-brown mudstone;
1 foot of dark red ferruginous sandstone;
4 feet of green siltstone;
3 feet of dark red ferruginous sandstone; (Sample No. Ha 248A)
2½ feet of green mudstone, fossiliferous;
2½ feet of green siltstone with some lenses of dark red ferruginous sandstone;
4 feet of green mudstone with some thin (2 inch) bands of red ferruginous sandstone;
28 feet concealed;
26 feet of grey, glauconitic sandstone; fossiliferous;
13 feet concealed;
15 feet of grey quartz sandstone with lenses of brown dolomite
Bottom of slope.

593 feet of Cambro-Ordovician beds underlying.

In this section there is thus a total of 6½ feet of sedimentary iron in recognisable beds, plus some lenses of iron in green siltstone and green mudstone. The interval of 32 feet between 684 feet and 716 feet above the base of the section contains a total of 6 feet of ironstone. The dip of the beds is usually less than 10 degrees.

Sample Ha 248A and Sample Ha 350, (whose locations are shown on Plate 1) were analysed in the Bureau's laboratory. The results of this analysis, performed by A. McClure, are:

Sample No.	Fe_2O_3, %	Insolubles, % (conc.Hcl)	Moisture, % (110 degrees)
Ha 248A	39.6	43.3	0.65.
Ha 350	25.7	53.4	0.37.

The total iron content is expressed as % Fe_2O_3. The insolubles from these specimens consisted mainly of grains of sand.

The thickness of individual ironstone beds, where observed, is usually of the order of those in the type section of the Cambro-Ordovician beds. However, 50 feet of ferruginous sandstone were recorded in a section measured about one mile west of Mt. Ultim; the top of this sandstone is about 25 feet below the base of the Dulcie Sandstone and the dip does not exceed 3 degrees. Although the percentage of Fe_2O_3 in the 50-foot interval probably would not exceed 15 (visual estimation) in the measured section the unit can be traced, by its colour, over a distance of about two miles. In this distance the percentage of Fe_2O_3 may vary.

During the regional mapping of the Huckitta four-mile sheet the ferruginous beds were recorded when observed, but no detailed mapping or sampling programme was carried out in them. Beds of similar type were observed, by M.A. Condon, in a similar stratigraphic position near the north-western tip of the Tarlton Range, some 70 miles to the east of Point Spring.

Plate I.

Dud Dulcie Sandstone

€-O Cambrian-Ordovician beds

€ua Arrinthrunga Formation.

× "Oolite" localities (observed)

Approximate Scale

4 0 4 8 12 Miles

N

Bundey River

Dud

Dulcie Range

€ub

€-O

B Horse Plain

Mac Donald Downs

Mt Ultim

Mt Swan

Dneiper

Ha 350

Huckitta

€ua

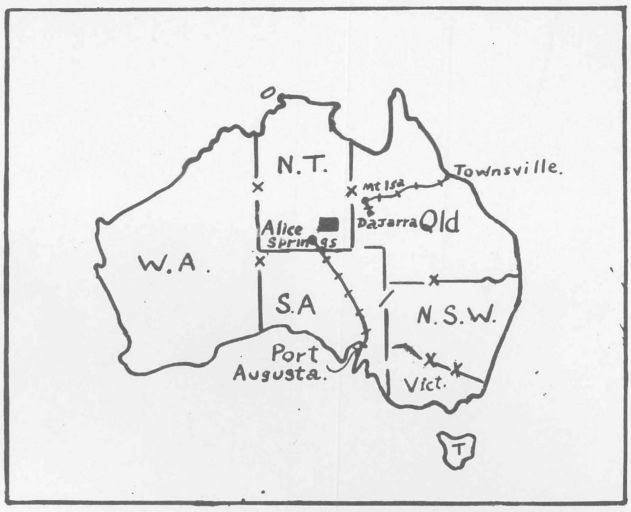
Dud

Picton Spring

Ha 248A

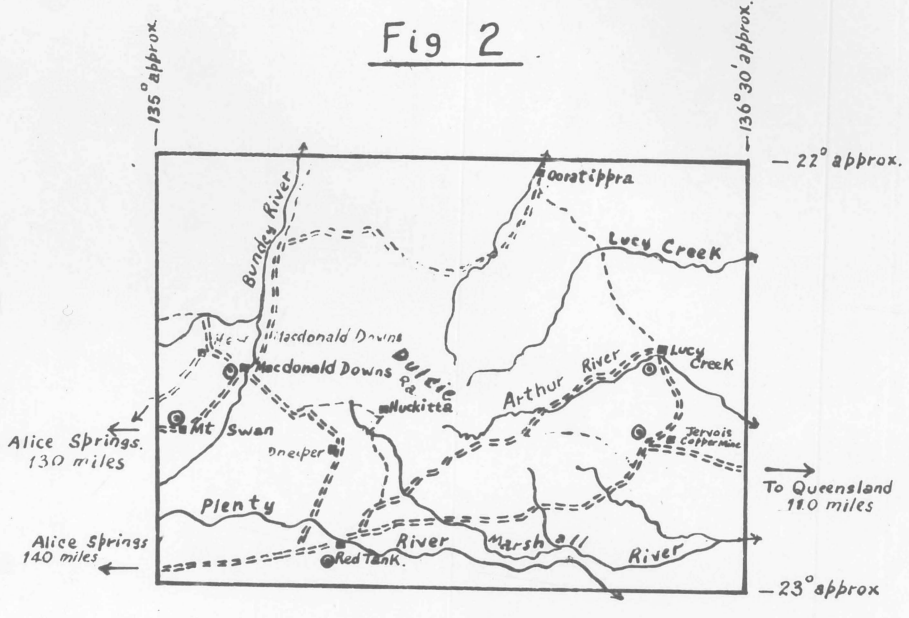
Point Spring

Fig 1



Locality Map, showing railheads.

Fig 2



Locality Map

Scale: 32 Miles to 1 inch

Reference:

==== Road.

---- Vehicle Track

■ Homestead.

⊙ Landing Ground.