COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1962/60

EXPLANATORY NOTES ON THE PELLEW 1:250,000 GEOLOGICAL SHEET - SD 53-16.

Compiled by

J.W. Smith.

EXPLANATORY NOTES ON THE PELLEW 1:250,000 GEOLOGICAL SHEET - SD 53-16

Compiled by

J.W. Smith

RECORDS 1962/60

CONTENTS

PLATE

1:250,000 GEOLOGICAL MAP OF THE PELLEW SHEET

EXPLANATORY NOTES ON THE PELLEW 1:250,000 GEOLOGICAL SHEET - SD 53-16

Compiled by

J.W. Smith

RECORDS 1962/60

INTRODUCTION

The Pellew Sheet area lies within the latitudes 15°00' and 16°00'S., and longitudes 136°30' and 138°00'E. All land on the Sheet area is in the south-west quarter and consists of a part of the coast of the Gulf of Carpentaria, and the islands of the Sir Edward Pellew Group - eight large islands and more than 50 small ones. Vanderlin Island is the largest and is about 19 miles long by 11 miles wide.

One family lives near Clarkson Point in the south-west of Vanderlin Island; elsewhere the area is uninhabited.

A graded road joins Black Rocks Landing, near the junction of the McArthur River and Batten Creek, to Borroloola. Access to the Sir Edward Pellew Group is by boat from Black Rocks Landing on the McArthur River or from the Wearyan River. Small coastal vessels call infrequently at Vanderlin Island and Black Rocks Landing.

Photographs and maps covering the area are: Pellew air photographs (scale 1:50,000), flown by the Royal Australian Air Force in 1950; Pellew photoscale maps, prepared by the Division of National Mapping, Department of National Development; Pellew 1:250,000 topographic series - SD 53/16, Zone 5 - Division of National Mapping; Pellew 4-mile uncontrolled photomosaic; Pellew 8-mile military series D53/11-12-15-16, Zone 5; Chart - Gulf of Carpentaria - published by the Admiralty, London in 1929, and revised in 1950.

The Sheet area lies within the sub-tropical part of Australia. Maximum day temperatures are over 95°F in summer and minimum day temperatures 60-65°F. in winter. The rainfall, which falls mainly in the months, December to March, is about 30 inches a year.

The Sir Edward Pellew Group was visited by geologists at the end of the nineteenth and beginning of the twentieth centuries (Parkes, 1891; Brown, 1908; Jensen, 1914). No published geological investigations were carried out between this period and 1961, when the Pellew Sheet area was mapped by the Bureau of Mineral Resources as a part of a programme of regional mapping in the Carpentaria Upper Proterozoic province (Dunn et al., in preparation).

PHYSIOGRAPHY

Two physiographic units are recognized in the Sheet area (Dunn et al., loc. cit.). These are the Coastal Plains, which comprise most of the area; and remnants of the Gulf Fall.

The Coastal Plains consist of residual sand and soil with coastal silt and sand, fringing the Gulf on the mainland and in small isolated areas on the islands of the Sir Edward Pellew Group. Evaporite deposits occur in the Robinson River Sheet area to the south and may occur also in the Pellew Sheet area. Residual sand dunes are on the Sir Edward Pellew islands and along parts of the mainland adjacent to the coast. On the islands they are up to 30 feet high. A few low ridges of sandstone crop out on the mainland.

The hill country of the Sir Edward Pellew Group is commonly up to about 200 feet above sea level, but locally the islands are about 300 feet high. The highest country is in the west of Vanderlin Island and on North Island. Because of strong jointing in the rocks the hills are rough and dissected. In the east and north of Vanderlin Island the Vanderlin Limestone forms rounded hills. Blowholes are common in this formation.

Rivers on the mainland are tidal. There are a few small freshwater creeks and Lake Eames, on Vanderlin Island, also contains fresh water.

STRATIGRAPHY

The Sheet area consists of an Upper Proterozoic sandstone, which is part of the Masterton Formation - overlain by Mesozoic and Cainozoic sediments.

UPPER PROTEROZOIC

Masterton Formation. The Masterton Formation is part of the Tawallah Group (Dunn et al., loc. cit.). The Formation crops out extensively on the Sir Edward Pellew Group and in a few places on the mainland in the Sheet area. It is about 300 feet thick, but its base is not exposed. It is more widespread elsewhere in the Carpentaria Upper Proterozoic province (Dunn et al., loc. cit.).

On the Sheet area the Formation is a white to pink, thin-bedded, medium-grained quartz sandstone, which is characteristically cross-bedded. It is commonly blocky or massive, but at Red Bluff it is flaggy.

At Kedge Point on the west coast of Vanderlin Island coarse-boulder sandstone breccia, with boulders of sandstone and quartz to 3 feet in length, is overlain by pebble to coarse-boulder conglomerate, which grades upwards to pebbly sandstone. The conglomerate and breccia are each about 20 feet thick.

Pisolitic iron rubble covers a slightly ferruginous sandstone at Red Bluff on the east coast of North Island.

MESOZOIC

Lower Cretaceous (?)

About 15 feet of brown and yellow ferruginous medium-grained sandstone overlies the Masterton Formation on the east coast of Vanderlin Island at Ulabarra Creek (local name). Pebble to cobble conglomerate occurs locally at the base. The sandstone may occur south of Barbara Cove. These outcrops are unfossiliferous, but they are similar in lithology to Neocomian-Aptian rocks which are widespread in the northern part of the Northern Territory.

CAINOZOIC

Vanderlin Limestone. The Vanderlin Limestone crops out only in the Sir Edward Pellew Group, mainly on Vanderlin Island, and small islands on the east side of Vanderlin Island.

The limestone is light yellow to white. It is coarsely cross-bedded with tabular cross-beds up to 15 feet thick. The topset consists mainly of flaggy shelly limestone containing only gastropods, and the foresets and bottomsets consist of unfossiliferous, finely oolitic limestone. A few thin bands of quartz sandstone are found in the foreset beds. Elsewhere throughout the Sir Edward Pellew Group, limestone associated with sand dunes may be recemented dunes.

The present elevated position of the Vanderlin Limestone may be related partly to eustatic changes in sea level and partly to slight Cainozoic movement on a fault, which is postulated to lie immediately to the east of the small islands off the east coast of Vanderlin Limestone. Since the limestone is now 130 feet above sea level its present emergence may not be due entirely to change in sea level.

STRUCTURE

The dip of the Masterton Formation is sub-horizontal; the Formation is faulted in a few places. Rocks of the Tawallah Group, including the Masterton Formation, which occur in the adjacent Robinson River Sheet area (Yates, 1962) to the south, are also sub-horizontal, and this region has been structurally stable. The Masterton Formation is moderately folded and strongly faulted on the adjacent Mount Young Sheet area (Plumb & Paine, 1962) to the west.

Mesozoic and Cainozoic sediments are horizontal and faulted in one place to the east of Vanderlin Island.

Tho Masterton Formation is jointed, particularly in the North Island. Joints do not appear to form a linear pattern and in some places the joints are curved.

ECONOMIC GEOLOGY

No mineral occurrences of possible economic importance have been recorded on the Pellew Sheet area. Minor malachite stains are seen at Red Bluff on North Island in the Masterton Formation, and also in a small outcrop of Masterton Formation near Muggs Mistake in the McArthur River. Elsewhere in this area the formation is covered by lateritic soils.

Salt from a tidal lagoon on the adjacent Robinson River Sheet area to the south, is mined on a small scale. Similar deposits may exist on the Pellew Sheet area.

BIBLIOGRAPHY

BROWN, H.Y.L., 1908 - Report on a Geological Reconnaissance from Van Diemans Gulf to the McArthur River etc. S. Aust. Parl. Papers 1908, 25.

DUNN, P.R., SMITH, J.W., and ROBERTS, H.G., 1962 - The Geology of the Carpentaria Upper Proterozoic Province: Part I - Roper River to Queensland border. Bur. Min. Resour. Aust. Bull. (in prep.).

JENSEN, H.I., 1914 - Geological Report on the Darwin Mining District McArthur River District and the Barkly Tableland. Bull. N. Terr. 10.

PARKES, J.V., 1891 - Report on Northern Territory Mines and Mineral Resources. S. Aust. Parlt Papers. 1891 No. 32.

PLUMB, K.A., and PAINE, A.G.L., 1962 - Mount Young 1:250,000 Geological Series D/53-15. Explan. Notes Bur. Min. Resour. Aust. (in prep.).

YATES, K.R., 1962 - Robinson River 1:250,000 Geological Series F/53-4 Explan. Notes Bur. Min. Resour. Aust. (in prep.).

PELLEW
NORTHERN TERRITORY

AUSTRALIA 1:250,000

1:250,000 GEOLOGICAL SERIES SHEET SD 53-16

Reference

CAINOZOIC	QUATERNARY	Qa	Coastal silt and sand
		Czs	Soil, sand
			Coastal sand dunes, and cemented older dunes
		Czl	Laterite and lateritic soil
	Vanderlin Limestone	Czv	Flaggy to massive, thin-bedded oolitic and rocky limestone
PRECAMBRIAN MESOZOIC	LOWER CRETACEOUS	Ks	Ferruginous sandstone. Minor basal pebble conglomerate
	UPPER PROTEROZOIC Tawallah Group	Masterton Formation Etn	White and pink medium-grained quartz sandstone. Local polymictic conglomerate, Flaggy fine-grained quartz sandstone, ferruginous sandstone

- Geological boundary, position approximate
- Established fault, position accurate
- Established fault, position approximate
- Inferred fault, concealed
- Strike and dip of strata
- Horizontal strata
- Joint pattern
- Sand ridge

} air-photo interpretation

- Vehicle track
- Homestead
- Astro station
- Reef
- Watermale

NB • Commonly used local names

Compiled and published by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Topographic base compiled by the Division of National Mapping, Department of National Development. Aerial photography by the Royal Australian Air Force; complete vertical coverage at 1:50,000 scale.
Transverse Mercator Projection

INDEX TO ADJOINING SHEETS
Showing Magnetic Declination

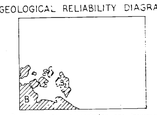
ROPER RIVER	SCAPE BEATRICE	
MT YOUNG	PELLEW	
BAUHINIA DOWNS	ROBINSON RIVER	MORNING-TON

ANNUAL CHANGE 1°E

Scale 1:250,000

5 0 5 10 15 MILES
5 0 5 10 15 20 25 KILOMETRES

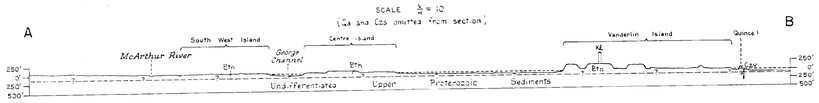
GEOLOGICAL RELIABILITY DIAGRAM



B Air-photo interpretation and traverses

Geology, 1961, by: J.W.Smith
Compiled, 1962, by: F.J.Roberts
Drawn, 1962, by: F.J.Roberts

Section A-B
SCALE 1/2 = 10
(Czs and Czs omitted from section)



PELLEW
SHEET SD 53-16