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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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(LENDING SECTION)

Record 1971/100

MESOZOIC STRATIGRAPHY AND STRUCTURE OF THE GEORGETOWN 1:250,000 SHEET AREA, QUEENSLAND

by

R.S. Needham

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ENCLOSURE Preliminary to the Second Edition Georgetown 1:250,000 Sheet

SUMMARY

Remapped Mesozoic and younger sediments are shown on the preliminary to the Second Edition Georgetown 1:250,000 Sheet. Croydon Ignimbrite, 1600 m.y. old, is overlain by Inoruni Sandstone of uncertain but probable Mesozoic age. Later Mesozoic units mapped consist of the Middle (?) to Upper Jurassic Eulo Queen Group, the Upper Jurassic to Lower Cretaceous Gilbert River Formation and the Lower Cretaceous Wallumbilla Formation. Late Cretaceous (?) and Cainozoic units comprise clayey sandstone (Bulimba Formation and Wyaaba Beds), outwash deposits, and flood plain and stream bed sediments. Duricrusts have developed on some Mesozoic and Cainozoic (?) strata. The Inoruni Sandstone and older rocks have a similar system of faults and joints. Structural contours on the unconformity between basement rocks and Jurassic and Cretaceous Carpentaria Basin formations, and on basin formation tops and bottoms demonstrate arching, tilting, and faulting of the Sheet area mostly after Mesozoic deposition ceased.

INTRODUCTION

A party from the Bureau of Mineral Resources and the Geological Survey of Queensland mapped the Georgetown and surrounding Sheet areas at 1:250,000 scale from 1956 to 1958. K17 air photographs flown by RAAF at a scale of 1:43,000 were used. The results were recorded by White & Hughes (1957), Wyatt (1957), and White, Best, & Branch (1959); Reynolds (1960) mapped the Mesozoic sediments on the western part of the Georgetown Sheet. Mary White (in White & Hughes, 1957) determined plant remains collected from the Mesozoic sediments. White (1962) compiled Explanatory Notes for the Georgetown Sheet area, listing all investigations carried out in the area to that date.

A combined BMR and GSQ party remapped the Mesozoic and Cainozoic sediments of the area in 1969 and 1970 (H.F. Doutch, J. Ingram, J. Smart of BMR and K.G. Grimes of GSQ, in 1969; R.S. Needham of BMR in 1970). RC9 photographs flown by Adastraphoto in 1958 at a scale of 1:80,000 were used. Smart et al. (1971) and Doutch et al. (1970) described new units recognized in the south of the Carpentaria Basin during this work, and correlated them with previously known units in the Eromanga Basin.

The Georgetown area covers a central part of the Georgetown Inlier, a large mass of Precambrian to Permian rocks consisting mainly of granite, rhyolite, ignimbrite, schist, gneiss, and dolerite; the younger igneous rocks are evidently associated with cauldron and ring complexes described by Branch (1966) but more age dating is necessary before detailed age associations of these rocks can be determined.

The inlier extends westwards from the Hodgkinson Basin and, together with the Euroka Arch, effectively divides the Eromanga Basin to the south from the Carpentaria Basin to the north. The lithology of the sediments of the two basins can be compared in the Georgetown area, particularly as the Mesozoic strata are well exposed in the south and west.

MESOZOIC STRATIGRAPHY

Laing & Power (1959) named and described the Inoruni Sandstone as 'moderately clean quartz sandstone with minor grits and shales', and recorded it as overlying weathered Croydon Felsite, since renamed

Croydon Ignimbrite and now dated as Proterozoic (1600 m.y.: Sheraton & Labonne, in prep.). They named sandstones unconformably overlying the Inoruni Sandstone and containing Aptian marine fossils the 'Gilbert River Formation'.

Reynolds (1960) extended the Gilbert River Formation south and suggested that subdivision of the formation might be possible after further work. He noted that the sandstones of the Gregory Range thickened southwards, and that a 'sandy freshwater facies' in the east gave way to an 'interbedded sandstone and shaly siltstone marine facies' in the west.

Present remapping has shown that the 'Gilbert River Formation' of Reynolds, where it thickens to 120 m in the Gregory Range near the southern margin of the Georgetown Sheet area, consists of Gilbert River Formation as defined by Laing & Power, and both younger and older Mesozoic units directly correlatable with the Eromanga Basin sequence. A complete section of those units in the Gregory Range is exposed about 2 km northwest of Glenora homestead (A, Fig. 1).

Inoruni Sandstone (Mi)

The clean quartz sandstones outcropping near Inorunie homestead occupy a basin 24 km long by 16 km wide. The lithology of the formation has been described by Reynolds (1960). It mainly overlies Proterozoic Croydon Ignimbrite. In the south of the basin, valleys in the Inoruni Sandstone contain dolerite and agate-bearing basalt, perhaps coeval with the Agate Creek Volcanics of Permian age, perhaps much older. Airphoto interpretation and spot checks in the field suggest the formation could be divided into three units: the lowest, in the north, is more massive than the middle unit, and the highest, in the south, tends to be flaggy and weathers and erodes to softer, rounder landforms than the other two.

Dips of up to 10° are present in the sandstone; Reynolds (1960) suggested that their distribution and directions show that they are partly depositional, and that buckled shaly beds probably resulted from slumping during deposition. The depth of the basin and its mode of formation are unknown, but Laing & Power (1959) measured 300 m of section, and Branch (1966) suggested that the structure of the Inoruni Sandstone was caused by 'collapse of a roof above a ring intrusion of Esmeralda Granite' forming 'a basin bounded by a ring fault in which the downfaulted Inoruni Sandstone is now preserved'. (See 'Structure' for further discussion).

Branch concluded that owing to the absence of tuffaceous debris in the Inoruni Sandstone the underlying volcanics were not its source, and that as muscovite, blue tourmaline, zircon, and apatite were present and feldspar absent from the sandstone, its source was probably the Precambrian sediments 16 to 32 km to the east. It is even possible that the sandstone is a Precambrian outlier.

The Inoruni Sandstone is disconformably overlain by the Gilbert River Formation. Plant roots in lithified soil on the Inoruni Formation near Mt Little appear to predate the Gilbert River Formation.

Whatever the mechanism for preservation of the Inoruni Sandstone the sandstone clearly represents a sedimentary phase distinct from that represented by the 'Gilbert River Formation' of Reynolds; the Inoruni Sandstone is thus regarded as part of the 'basement' in stratigraphic and structural discussions which follow. Its age is unknown; it could be as old as Proterozoic, or as young as Triassic or earliest Jurassic.

Post-Inoruni Sandstone units

The Gregory Range section exposed at Glenora, all named 'Gilbert River Formation' by Reynolds (1960), was subdivided and correlated with the northern Eromanga Basin sequence by Smart et al. (1971). It consists of the Middle? to Upper Jurassic Eulo Queen Group, the Upper Jurassic to Lower Cretaceous Gilbert River Formation, and the Lower Cretaceous Wallumbilla Formation.

Figure 1 shows how the Eulo Queen Group is overlapped to the north-west, north, and east by the Gilbert River Formation. The Eulo Queen Group is confined to the central south of the Georgetown area, but continues to the south; its sediments were deposited in the Millungera Depression (Doutch et al., 1970). It is continuous farther to the south with sandstone units of the Eromanga Basin sequence (discussed by Smart et al., 1971), but is not known between this Sheet area and F.B.H. Wyaaba No. 1 to the north, in the Carpentaria Basin (Needham & Doutch, 1971b).

The Gilbert River Formation, consisting of the Yappar and Coffin Hill Members, is continuous to the north and west throughout the southern part of the Carpentaria Basin, and to the south where it probably becomes the Hooray Sandstone of the Eromanga Basin (Smart et al., 1971).

The Wallumbilla Formation is continuous throughout the Carpentaria and Eromanga Basins (Vine, 1966; Doutch et al., 1970).

Eulo Queen Group

The Hampstead Sandstone (Figs. 2, 3) is typically a fluvial, strongly cross-bedded, coarse-grained, pebbly, clayey quartz sandstone with pebble beds. It is thick bedded and contains pebbles of basement rocks common in the Georgetown Inlier. It generally has a light grey photo-pattern and is commonly jointed and strongly dissected. Immediately southwest of the Robertson Fault (Fig. 4), however, the photo-pattern is white and the unit is strongly jointed and extremely dissected. The strong jointing has resulted from uplift along the Robertson and associated faults, and has resulted in intense erosion and only sparse soil development.

The Loth Formation is typically a fluvial, fine to coarse-grained, micaceous, quartz sandstone displaying some cross-bedding, with a few micaceous siltstone beds. Bedding varies from generally massive to flaggy. Where the formation lies directly on basement, basal pebble or conglomerate beds are present. It has a typically smooth white photo-pattern and lithology tends to be varied towards the margins of deposition.

Gilbert River Formation (Fig. 5)

The lightology of the Yappar Member is varied; fine, medium, and coarse-grained sandstone, in places clayey or ferruginous, with siltstone beds and minor cross-bedding are suggestive of a fluviatile to estuarine environment. Wood fragments, trails, and worm bores are common, especially towards the top. The member is present throughout the Georgetown Sheet area except in part of the Newcastle Range northwest of Einasleigh, where the higher Coffin Hill Member lies directly on basement rocks.

The Coffin Hill Member is typically a fine to coarse-grained sublabile clayey sandstone, commonly ferruginous and glauconitic, with bands of mottled purple siltstone. The lithology indicates an estuarine to paralic environment for the lower part of the member, but the occurrence of marine fossils confirms the onset of shallow marine conditions. Wood, borings, and trails are common throughout the member, and ripple marks are present towards the top.

Fig. 1

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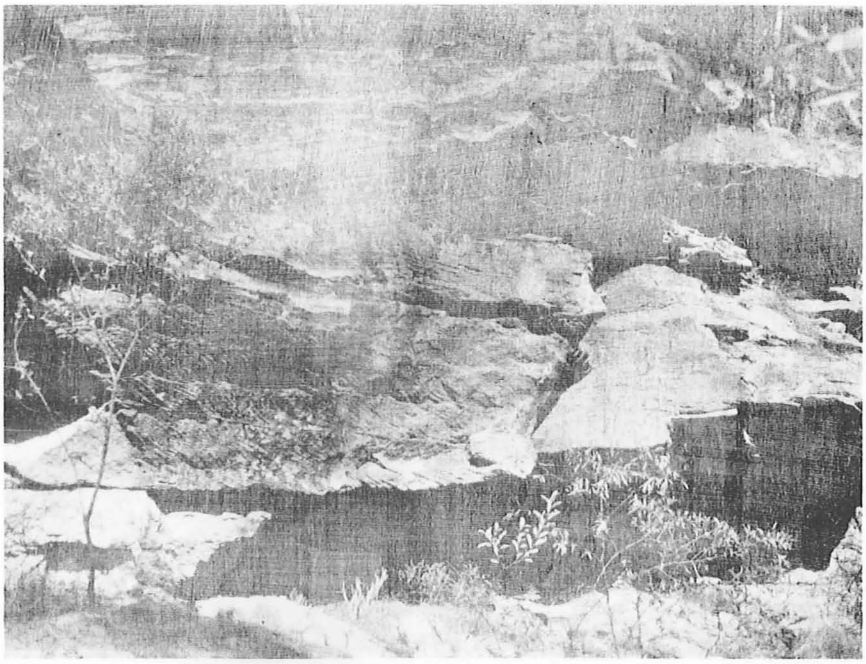


Figure 2. Cross bedding in Hampstead Sandstone, 11 km. south of Robin Hood homestead. (GA4733)

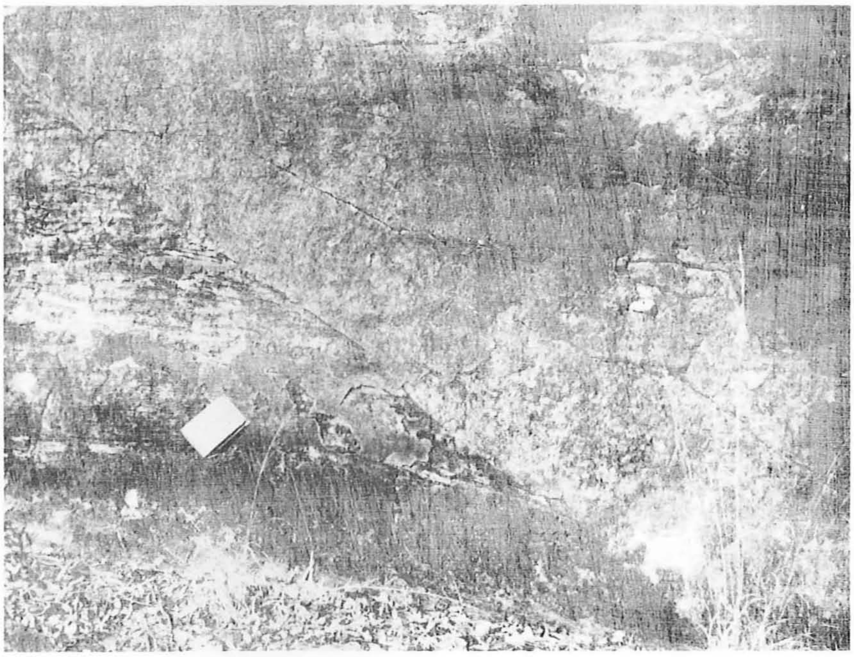


Figure 3. Channel fill in Hampstead Sandstone, same locality (GA4738)

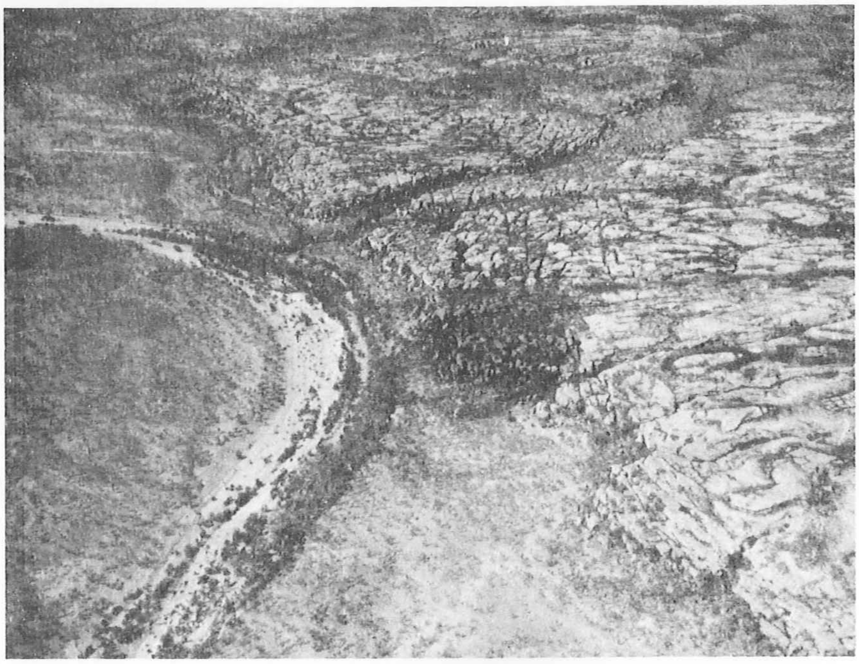


Figure 4. Robertson Fault and Hampstead Sandstone, looking south along Robertson River (GA4749)

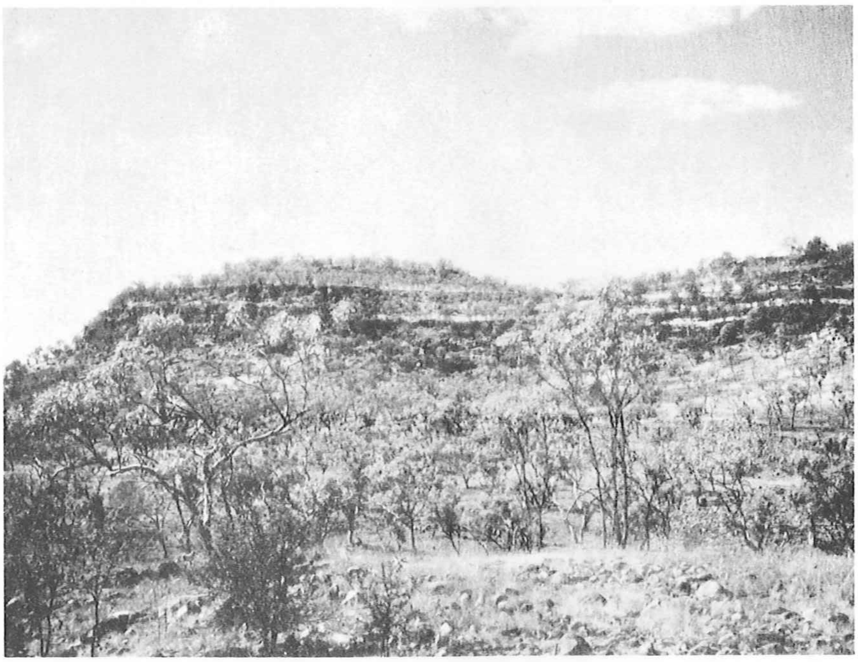


Figure 5. Brennans Knob. Yappar and Coffin Hill Members of Gilbert River Formation (GA4726)

Table 1 lists the marine fossils collected from the Coffin Hill Member in the Georgetown area during 1970; Reynolds (1960) listed fossils collected to that date.

In the Wirra Wirra region in the east of the Sheet area (785980) the member is composed almost entirely of brown and purple mottled siltstone. The lithology may reflect a change in environment close to the margin of Coffin Hill deposition, the shoreline being probably parallel with the Newcastle Range. The sea transgressed the range at Routh Creek(786968) owing to its generally lower elevation in that area.

Wallumbilla Formation

The Wallumbilla Formation is typically a massive sandy mudstone and siltstone in this Sheet area. It occurs in the Georgetown area in the Gregory Range and represents a continuation of lower Cretaceous marine sedimentation initiated during the Gilbert River Formation deposition.

CAINOZOIC STRATIGRAPHY

Cainozoic sedimentary units in the Georgetown area consist of fluvial clayey sandstone (Bulimba Formation and Wyaaba Beds), high level outwash deposits (Czs), and Quaternary flood plain and stream bed sediments (Qa, Qra). The outcrops of Mesozoic strata are in some places deeply weathered and ferruginized to form 'duricrust' (Td), and ferricrete (Tf), representative of a period of deep weathering following deposition of the Bulimbw Formation.

The Bulimba Formation represents fluvial deposition after regression of the Mesozoic sea. No age-diagnostic spores or fossils have been found. In outcrop and photo-pattern the Bulimba Formation is similar to the Yappar Member of the Gilbert River Formation. It is probably formed in part of sediment derived from Mesozoic strata, and owing to the short distance of transport involved bears a resemblance to the Mesozoic units, although it is not so well consolidated. The Wyaaba Beds were deposited on the duricrusted Bulimba Formation mainly after Pliocene(?) downwarping.

The period of deep weathering evidenced by the occurrence of 'duricrust', and the dissection of the land surface and removal of much Mesozoic sediment from the area mostly since Cainozoic uplift, produced the present topography of the Georgetown area. Later Cainozoic deposition, including the Wyaaba Beds, has been restricted to deposition of valley-fill and piedmont sediments.

STRUCTURE

Detailed remapping and recognition of several Mesozoic units within the Georgetown area has enabled stratigraphic contouring. Interpretation of the contours depends on the original pattern of deposition.

The limit of outcrops of the Eulo Queen Group is here interpreted as indicative of a margin of deposition. The margin, roughly semicircular and open to the south, suggests that original depositional dips would have been to the south. Similarly the general position of the Gilbert River Formation in the Georgetown and surrounding areas suggests that original depositional dips could have been to the west; the relatively simple contour pattern of Gilbert River strata seen in the northeast of the area in Figure 2 may be partly the result of original depositional dips.

Figure 2 shows stratigraphic contours drawn at the bases of the Loth Formation and the Coffin Hill Member. Both sets of contours indicate a dip predominantly to the northwest at generally less than ½°. The contours are displaced along predominantly northwesterly trending discontinuities. The main one is here named the Robertson Structure, which is a fault (the Robertson Fault) in the southeast, where a fault scarp is present along the west bank of the Robertson River (Fig. 4).

Section A-B (Fig. 3) illustrates block faulting in the southern part of the Georgetown Sheet area. The most intense movements appear to have taken place in the region of Agate Creek (756912) where displacements of structural contours are greatest. The intensity of movement along the faults together with displacement of structural contours decreases to the northwest. For instance, the Candlow Arch is the continuation, in a west-northwesterly direction, of an upfaulted

TABLE 1. FOSSILS FROM THE COFFIN HILL MEMBER COLLECTED DURING 1970 BY R.S. NEEDHAM

	4 m. N. of EINASTOBAC 1 BORE	STONY ETHERIDGE CREEK	ROUTH CREEK	TABLETOP CREEK	BRENNANS KNOB
Bivalve fragments indet.				X	X
Maccoyella barklyi					X
M. sp. indet.			X		
Panopea sp.					X
Teredo sp. (borings)					X
Lima sp.					X
Ammonite fragments					X
Worm trails (similar to those in Wrotham Park Sandstone)	X		X		
Burrows, trails	X			X	X
Wood	X	X	X	X	X
Coprolites?		X			

Localities are shown on Figure 1 and the 1:250,000 map block. The arch flattens out across a northerly trending structure along Three X Creek (681968) west of which Mesozoic strata dip more uniformly to the west over the Claraville Shelf.

The focus of post-Mesozoic tectonism appears to have been centred in the Agate Creek region, which itself is coincident with the intersection of the Robertson Structure and lineaments and faults which are a continuation of the Cork Fault and the Wetherby Structure in the Eromanga Basin. The focus appears to be one of long standing instability if the position of the Permian Agate Creek Volcanics can be used as evidence of this. The structures are old basement phenomena reactivated in late Cainozoic times, possibly in the Pliocene (Doutch et al., 1970).

Contouring of boundaries within the Eulo Queen Group and the Gilbert River Formation reveals the same structures shown by contouring of the unconformity between basement and the older Jurassic or Cretaceous units on it, excluding the Inoruni Sandstone (Figure 4); this shows that the faulting occurred after the end of the Mesozoic. The conincidence of the northwest-trending Ropewalk Structure with the margin of Eulo Queen Group deposition suggests however that warping along some basement fractures occurred during Mesozoic deposition.

Further evidence for the age of faulting is found in the northeast of this Sheet area and to the northwest of it, in the Staaten River Embayment/ Gilbert-Mitchell Trough Structure (Fig. 5; Needham & Doutch, 1971 a, b; Simpson, in prep.). Its southwestern margin is the Robertson Structure; this is reflected in the Normanton and Red River Sheet areas in the southeasterly swing of seismic basement contours along the northeastern flank of the Croydon-Smithburne Basement High (Robertson & Moss, 1959; Simpson, in prep.) which lies northwest of and in line with the Candlow Arch.

In the Embayment the relationship of late Cretaceous or early Tertiary Bulimba Formation to Mesozoic strata suggests that the former was deposited disconformably on the latter as a thin, distally thinning, 'piedmont' sheet before the Trough was formed.

That the Trough represents a deepening of the Embayment after deposition of the Bulimba Formation is suggested by the distribution and thicknesses of the late Cainozoic Wyaaba Beds, laid down disconformably on the Bulimba Formation as a distally thickening sheet, and by their burying of the deeply weathered profile developed on the Bulimba Formation (Warner, 1968; Doutch et al., in prep.). It is also suggested by a kink in Mesozoic basement contours along the Robertson Structure which, taken together with fairly constant thicknesses of Mesozoic formations regionally, indicates post-Lower Cretaceous faulting.

Hence the Robertson Structure was apparently active after deposition of the Bulimba Formation. Doutch et al. (1970) suggest that most movement occurred in Pliocene times as the result of uplift along the eastern margins of the Carpentaria and Eromanga Basins, the Wyaaba Beds being consequent detritus eroded, in this Sheet area, from the Bulimba Formation and all older units.

The formation of the trough appears to be related to the mechanism of faulting in the Georgetown area i.e. rotational block faulting. The 'hinge' or southeastern margin of the trough appears to trend northeasterly from a point around Forest Home homestead, suggested by the margin of basement outcrops through the Red River area (Smart, in prep.). Northeast of the Robertson Structure rotational movement was downwards to the northwest of the hinge-line; however, upward movement occurred along the northeastern side of the Robertson Fault farther along the structure to the southeast, so that overall it appears to be an uneven scissors fault.

North to northeasterly trending fractures such as the Delaney Fault and the Three X Structure may be an expression of tension release along the hinge line of the southeastern margin of the Gilbert-Mitchell Trough.

The outline of the Georgetown Inlier is influenced by the Robertson Structure. Sectional sketches over the southwestern margin suggest that dips of the Eulo Queen Group steepen southwest of the margin into the Millungera Depression, and although the paucity of Mesozoic outcrops in the west of the Gilberton Sheet area hinders detailed contouring, Smart (1971) indicates that by this means fault block tilt and formation dips southwest away from the Robertson Structure.

The Inoruni Sandstone is preserved in a structural basin whose margins to the south and west are faulted, and to the north and east are formed by the unconformity between the sandstone and the underlying Croydon Ignimbrite. Strike of the sandstone is at first glance arcuate; dips are commonly between 5° and 10° and range from southeast to southwest, the sequence as a whole dipping southwards into the faulted margin. Dips could be said to indicate that the basin is a syncline plunging southwards.

However, folding does not appear to have been a primary structural movement. Faults and joints dominate structural style and there are no small scale folds except for some buckling in shaly beds that Reynolds (1960) suggests were deformed by slumping during deposition. The principal fault direction is northwest-southeast, and bedding dips are probably a result of block faulting.

A fundamental flexure and/or fault system having the principal trend divides the basin in two. In the southwestern half dips are southeasterly and in the northeastern half south to southwesterly. Smaller, less fundamental, faults are numerous and some movement probably occurred on many of the abundant joints, which also have a principal northwest-southeast trend.

Tilting and creation of joints predated deposition of the Gilbert River Sandstone. The principal trend of faults parallels the Robertson Structure, and some Cainozoic movement may have occurred on some of them. However, most faults disappear below Mesozoic cover. The principal trend is the same as that for joints in the Croydon Ignimbrite. There is therefore a possibility that the joints in the ignimbrite and the Inoruni Sandstone basin and its structures were the product of the same event, which was perhaps the intrusion of the Esmeralda Granite (cf. Branch, 1966) and that the sandstone is of Proterozoic age, and the dolerite and basalt below the basin in the south are related to the Cobbold Dolerite.

REFERENCES

BRANCH, C.D., 1966 - Volcanic cauldrons, ring complexes, and associated granites of the Georgetown Inlier, Queensland. Bur. Miner. Resour. Aust. Bull. 76.

DOUTCH, H.F., INGRAM, J.A., SMART, J., and GRIMES, K.G., 1970 - Progress report on the geology of the Southern Carpentaria Basin. Bur. Miner. Resour. Aust. Rec. 1970/39 (unpubl.).

DOUTCH, H.F., SMART, J., GRIMES, K.G., and NEEDHAM, R.S., in prep. - Progress report on the geology of the central Carpentaria Basin. Bur. Miner. Resour. Aust. Rec. 1972/64

LAING, A.C.M., and POWER, P.E., 1959 - New names in Queensland stratigraphy: Carpentaria Basin. Aust. Oil Gas J., 5(8), 35-6, 5(9), 28.

NEEDHAM, R.S., and DOUTCH, H.F., 1971a (in press) - Rutland Plains, Qld - 1:250,000 Gdological Series. Bur. Miner. Resour. Aust. explan. Notes SD/54-15.

NEEDHAM, R.S., and DOUTCH, H.F., 1971b (in press) - Galbraith, Qld - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. explan. Notes SE/54-3.

REYNOLDS, M.A., 1960 - Mesozoic and younger sediments of the Gilberton and Georgetown 4-Mile Sheet areas, Queensland. Bur. Miner. Resour. Aust. Rec. 1960/68 (unpubl.).

ROBERTSON, C.S., and MOSS, F.J., 1959 - Preliminary report on a seismic survey in the Carpentaria Basin, Queensland. Bur. Miner. Resour. Aust. Rec. 1954/4 (unpubl.).

SHELLEY, E.P., DOWNIE, D.N., and REES, J.E., in prep. - Airborne magnetic and radiometric survey, southern Cape York Peninsula, Qld, 1969. Bur. Miner. Resour. Aust. Rec. 1971/ (in prep.).

SHERATON, J.W., and LABONNE, B., in prep. - Geochemistry of Australian granites - Part 1 North Queensland. Progress report. Bur. Miner. Resour. Aust. Rec.

20

SIMPSON, C.J., in prep. - Normanton, Qld - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. explan. Notes SE/54-7.

SMART, J., 1971 (in press) - Gilberton, Qld - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. explan. Notes SE/54-16, 2nd Edition.

SMART, J., in prep. - Red River, Qld - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. explan. Notes SE/54-8.

SMART, J., INGRAM, J.A., DOUTCH, H.F., and GRIMES, K.G., 1971 - Recent mapping of the Carpentaria Basin - New stratigraphic names. Qld Govt Min. J., 72(836), 3-8.

VINE, R.R., 1966 - Recent geological mapping in the northern Eromanga Basin. Bur. Miner. Resour. Aust. Rec. 1966/84 (unpubl.).

WARNER, K.R., 1968 - Gilbert-Staaten Rivers groundwater investigation. Geol. Surv. Qld Rep. 24.

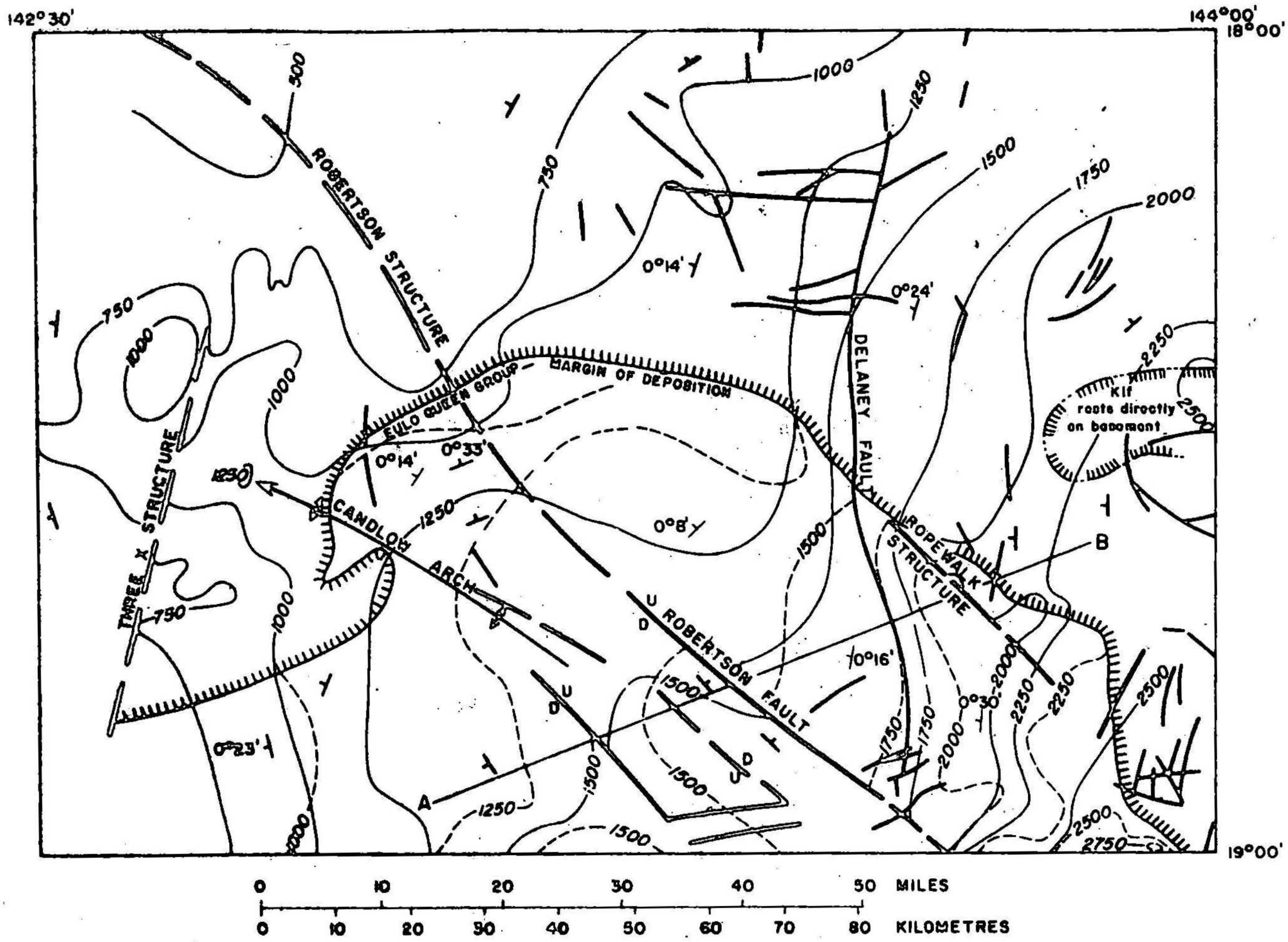
WHITE, D.A., 1962 - Georgetown, Qld - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. explan. Notes SE/54-12.

WHITE, D.A., BEST, J.G., and BRANCH, C.D., 1959 - Progress report on regional mapping, North Queensland, 1958. Bur. Miner. Resour. Aust. Rec. 1959/115 (unpubl.).

WHITE, D.A., and HUGHES, K.K., 1957 - Progress report on regional geological mapping, North Queensland, 1956. Bur. Miner. Resour. Aust. Rec. 1957/38 (unpubl.).

WYATT, D.H., 1957 - Linkin's uranium prospect, Percyville. Qld Govt Min. J., 53 (663), 39-43.

u



Faults

Affecting Mesozoic strata

In basement rocks only

Eulo Queen Group

North Margin of Deposition

Structural contours base of Lath Formation

Dips calculated from contours

Gilbert River Formation

Upper Member absent

Structural contours base of Coffin Hill Member

Dips calculated from contours

Regional dip of Mesozoic strata

Anticlinal axis and plunge of axis within Mesozoic strata

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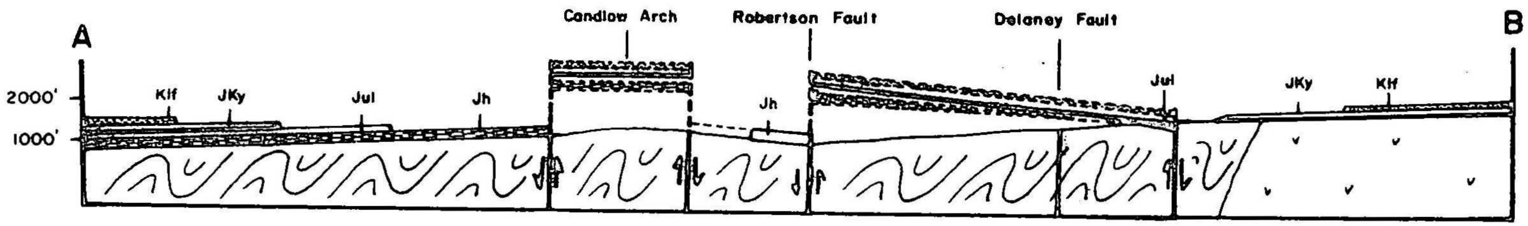
FIGURE 7

DIAGRAMMATIC SECTION A-B DISPLAYING FAULT CONTROL OF STRUCTURE



To accompany record 1971/100

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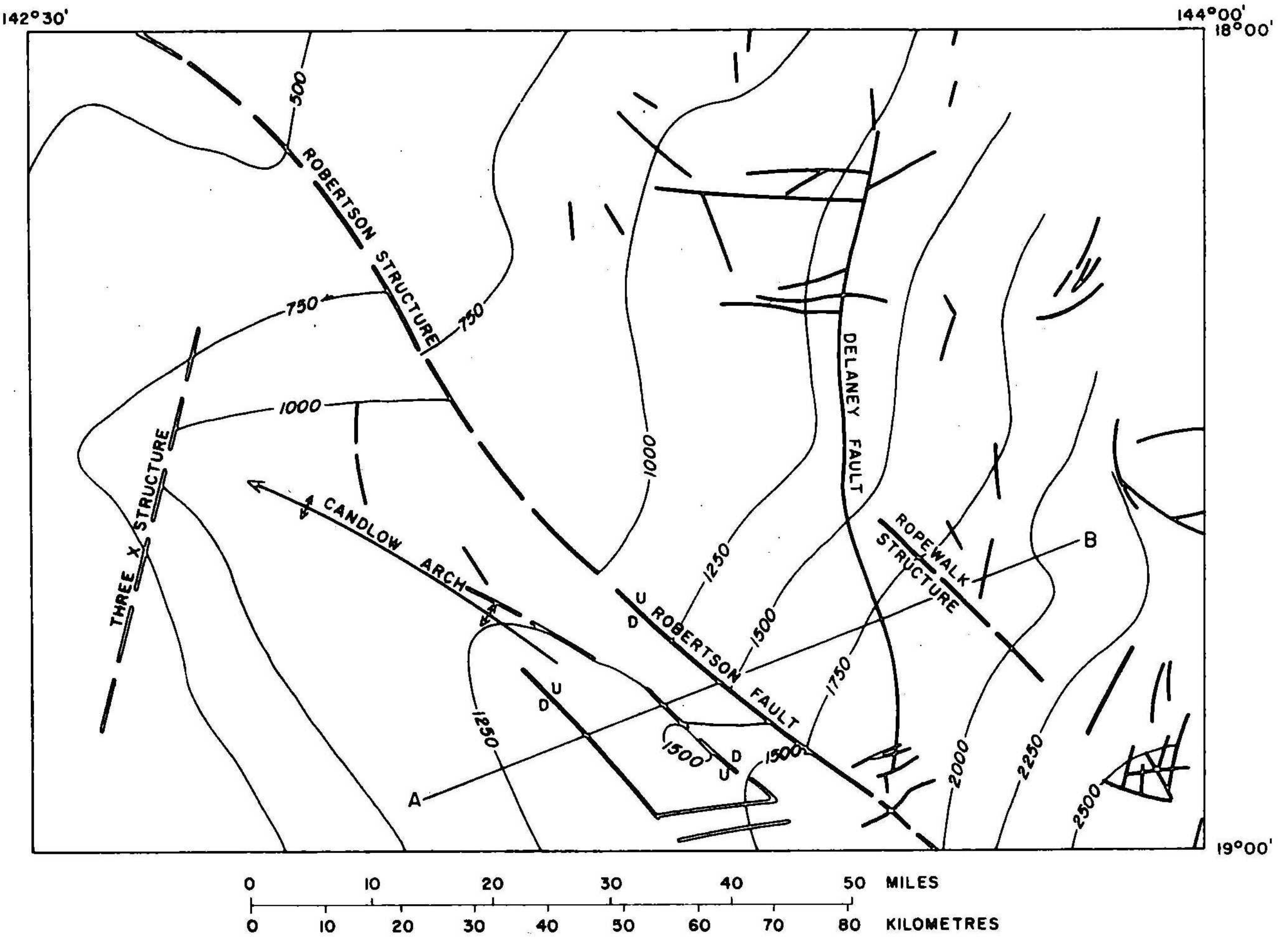
STRUCTURAL CONTOURS AT THE BASE OF THE
POST-INORUNI MESOZOIC UNITS, GEORGETOWN AREA

Fig. 8.



Faults

Affecting Mesozoic strata

In basement rocks only

Structural contours base of Mesozoic (excluding Inoruni Sandstone)

Anticlinal axis, direction of plunge

To accompany Record 1971/100

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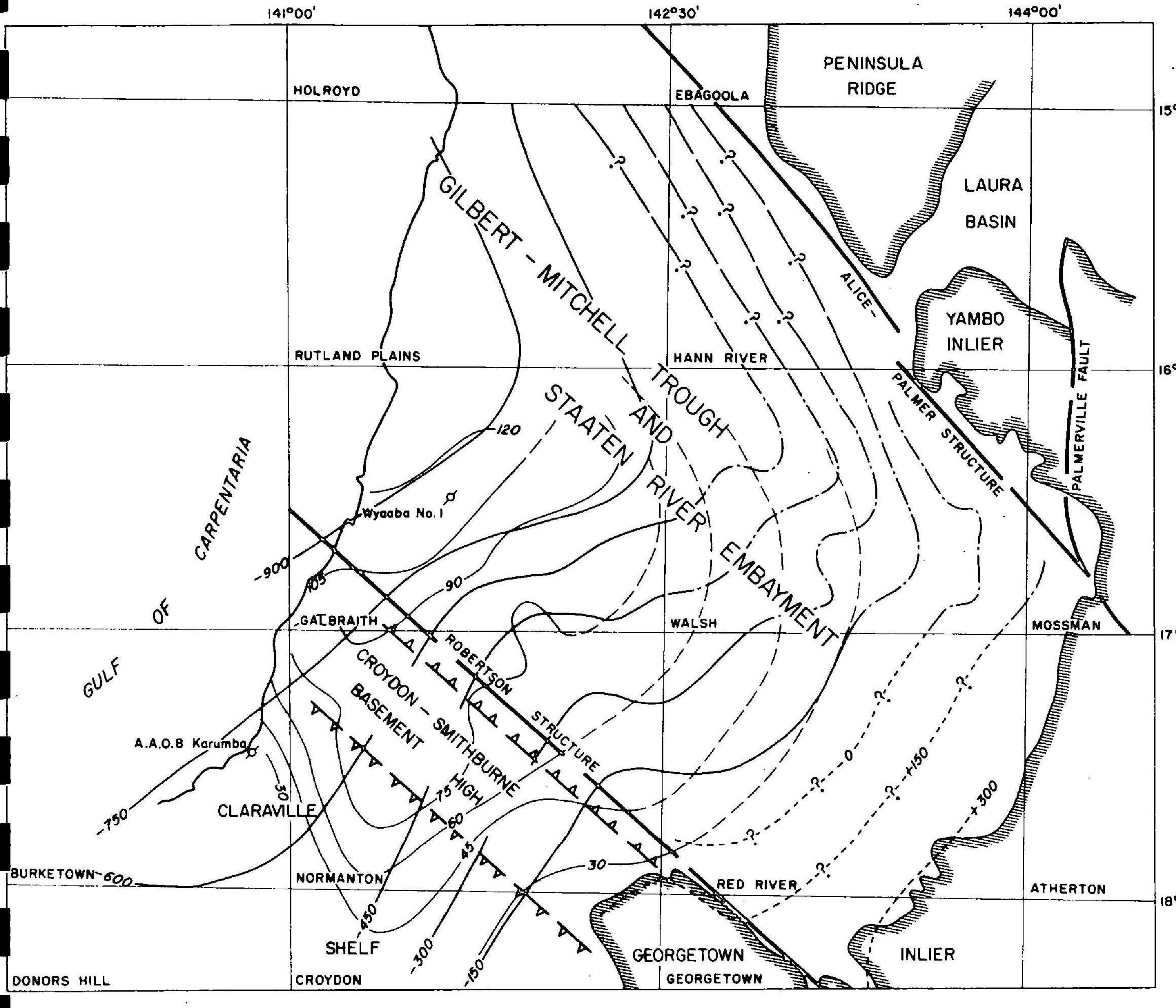


Cainozoic isopachs – Wyaaba Beds (metres)
After Warner (1968) (ground water study)
From other drilling

Mesozoic basement contours (metres ; datum MSL)
After Robertson and Moss (1959) (seismic), dashed where approximate
After Shelley et al (1971) (aeromagnetic)
Extrapolated from Needham (1971) (structural contours)

Fault or Structure
Edge of High
Edge of Pre-Mesozoic Basement
Abandoned oil exploration bore

0 20 40 60 80 100 KILOMETRES
0 20 40 60 MILES

To accompany Record 1971/100

Q/A339

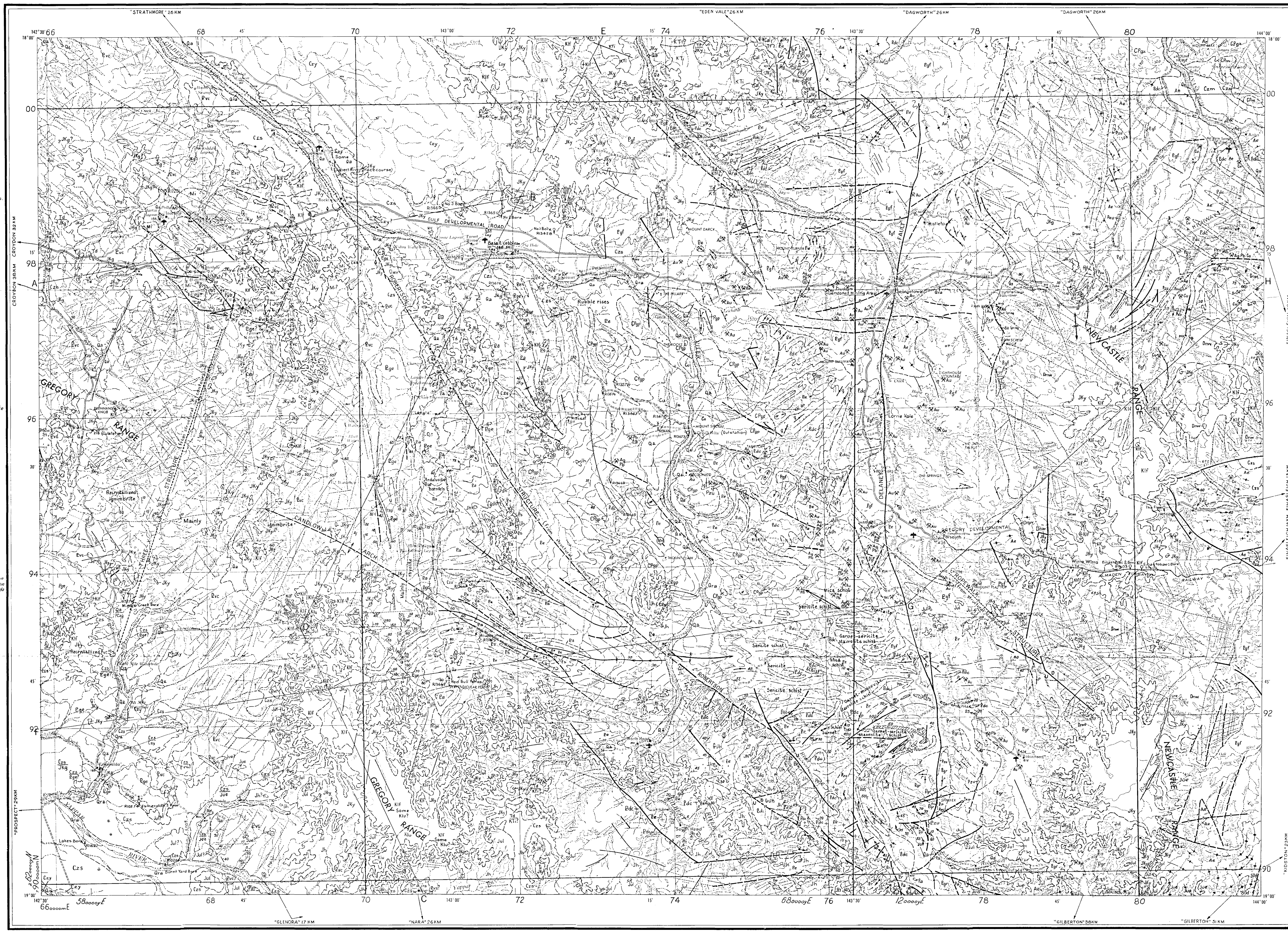
Fig.9. STRUCTURE AND SETTING OF THE GILBERT-MITCHELL TROUGH AND THE STAATEN RIVER EMBAYMENT

18

AUSTRALIA 1:250,000 GEOLOGICAL SERIES

GEORGETOWN
QUEENSLAND

SHEET SE 54-12



Reference

	Geological boundary
	Anticline showing direction of plunge
	Syncline, showing direction of plunge
	Fault (D, U, indicates relative movement down, up)

Where location of boundaries, folds and faults is approximate, line is broken; where inferred, queried; where concealed, boundaries and folds are dotted, faults are shown by short dashes.

	Plunge of minor anticline	
	Plunge added to trend line	
5	Strike and dip of strata	
+	Horizontal strata	
	Dip < 15°	air-photo interpretation
	Dip 15° - 45°	air-photo interpretation
	Trend line	air-photo interpretation
	Lineament	air-photo interpretation
	Joint pattern	air-photo interpretation
75	Strike and dip of foliation	
	Vertical foliation	
80	Strike and dip of cleavage	
5	Direction and plunge of lineation	
10 20	Lineation on bedding	
	Macrofossil locality	
	Plant fossil locality	
	Dyke; do-dolerite, p-pegmatite, q-quartz, r-rhyolite	
	Mine - not worked	
(Mn)	Unworked deposit	
Ae	Agate	
Ag	Silver	
Au	Gold	
Cu	Copper	
Mi	Mica	
Mn	Manganese	
Pb	Lead	
Sn	Tin	
Ta	Tantalite, columbite	
U	Uranium	
	Abandoned bore	
R13664	Sub-artesian bore	R13664 refers to bore registration number of the Queensland Irrigation and Water Supply Commission records
	Windpump	
T	Water tank	
	Dam on stream	
WH, WH	Waterhole	
	Spring - intermittent	
	Swamp	
750	Contour, value in metres	
	Highway	
	Road	
	Vehicle track	
	Railway with siding	
	Landing ground	
'Candlow'	Homestead	
	Building	
Yd	Yard	
	Fence	
	Telephone line	
405	Astronomical station, height in metres	
pd	Position doubtful	

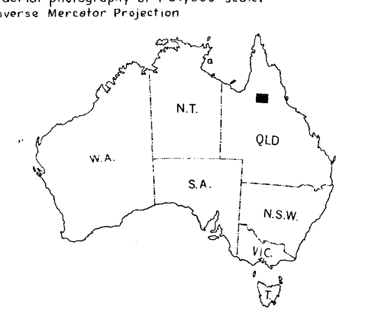
Reference

CAINOZOIC	QUATERNARY		Qra	Stream bed sediments: sand; silt; clay
			Qa	Flood plain alluvium: sand; silt; clay
	PLIOCENE TO RECENT		Czs	Colluvium and outwash deposits: quartzose sand and gravel
		Wyaaba Beds	Czy	Outwash plain deposits: sand and pebbles; clayey sandstone
		McBride Basalt	Czm	Olivine basalt
	TERTIARY ?		Tf	Nodular ferricrete ('laterite')
			Td	Ferruginized lithified soil and colluvium (duricrust)
	UPPER CRETACEOUS OR TERTIARY ?	Bulimba Formation	KTi	Poorly sorted clayey quartzose sandstone and granule conglomerate, pebbly in places, sandy claystone
MESOZOIC	LOWER CRETACEOUS	Wallumbilla Formation	Klu	Mudstone and quartz-poor sandstone, minor glauconitic sandstone
	UPPER JURASSIC TO LOWER CRETACEOUS	Coffin Hill Member	Klf	Clayey sandstone, siltstone, some shale, locally glauconitic at top; fossiliferous
		Gilbert River Formation	JKg	Quartzose sandstone, with minor conglomerate, siltstone, shale
		Yappar Member	JKy	Quartzose sandstone, minor conglomerate
	MIDDLE ? TO UPPER JURASSIC	Loth Formation	Jul	Quartzose clayey sandstone and siltstone
		Eulo Queen Group	Jue	Quartzose sandstone, siltstone, minor shale and conglomerate
		Hampstead Sandstone	Jh	Quartzose sandstone, commonly pebbly, some conglomerate
	?	Inoruni Sandstone	Mi	Quartz sandstone, some grit and shale
PALAEOZOIC	UPPER PALAEOZOIC		Pzu	Rhyolite, quartz porphyry
	LOWER TO MIDDLE PERMIAN	Agate Creek Volcanics	Pa	Ignimbrite, rhyolite, basalt, minor shale and mudstone
	UPPER CARBONIFEROUS TO LOWER PERMIAN	Prestwood Microgranite	CPgp	Grey porphyritic biotite microgranite
		Elizabeth Creek Granite	CPgz	Pink massive leucocratic adamellite
		Cumbana Rhyolite-Porphyry	CPm	Pink rhyolite porphyry
	UPPER CARBONIFEROUS	Cumberland Range Volcanics	Cu	Rhyolite, tuff, ignimbrite, minor arkosic sandstone and shale
		Galloway Volcanics	Cal	Rhyolite, ignimbrite, minor quartzose sandstone and conglomerate
	DEVONIAN ?	Newcastle Range Volcanics	Dnw	Rhyolite, ignimbrite, pyroclastics and arkosic sandstone and conglomerate
	UPPER SILURIAN ? TO LOWER DEVONIAN	Dumbano Granite	SDd	Grey biotite granite
PRECAMBRIAN	PROTEROZOIC	Forsayth Granite	Pgf	Grey porphyritic biotite granite
		Robin Hood Granite	Pgr	Pink-grey hornblende-biotite granite
		Esmeralda Granite	Pge	Grey biotite adamellite, granodiorite
		Croydon Ignimbrite	Pvc	Ignimbrite, rhyolite, rhyolite-porphyry
		Cobbold Dolerite	Pdc	Dolerite and amphibolite
		Langdon River Formation	Pa	Shale, siltstone, quartz-greywacke
		Etheridge Formation	Pe	Shale, siltstone, sandstone and chert
		Stockyard Creek Member	Ps	Carbonaceous siltstone
		Robertson River Metamorphics	Pr	Garnet-staurolite-mica schist, quartz-muscovite schist; Quartzite lenses
	ARCHAEAN ?	Einasleigh Metamorphics	Ae	Gneiss, migmatite, shist, amphibolite

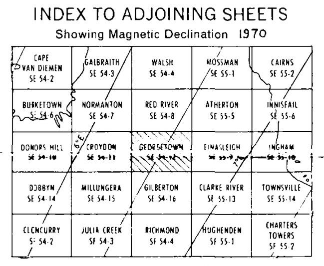
NOTE ON GRID COORDINATES
Brown ticks with black italic numbers (numbers shown only at SW corner of map and change of zone), indicate the 20,000 yard grid, Zones 6 and 7 (Australian Series), CLARKE 1858 SPHEROID. Transverse Mercator Projection

Brown numbered lines (with upright numbers), inside the neatline are 20,000 metre intervals of the superimposed Australian Map Grid, Zone 54 AUSTRALIAN NATIONAL SPHEROID. Transverse Mercator Projection

Compiled by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Issued under the authority of the Hon. R.W. Swartz, M.B.E., E.D., Minister for National Development.
Base map compiled by the Royal Australian Survey Corps from aerial photography at 1:84,000 scale.
Transverse Mercator Projection

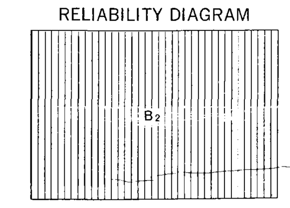


INDEX TO ADJOINING SHEETS
Showing Magnetic Declination 1970

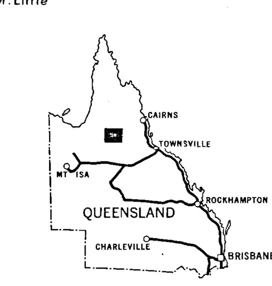


Scale 1:250,000

RELIABILITY DIAGRAM



B2 General reconnaissance: many traverses, and air-photo interpretation



Geology 1956-1958 by D.A.White, K.Hughes, J.B.Firman, C.D.Branch, J.G.Best, M.A.Reynolds, D.H.Wyatt.
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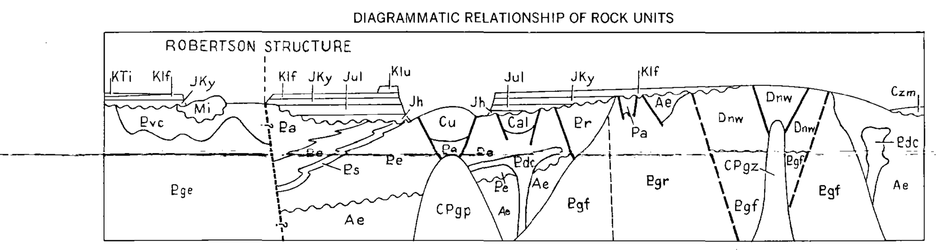
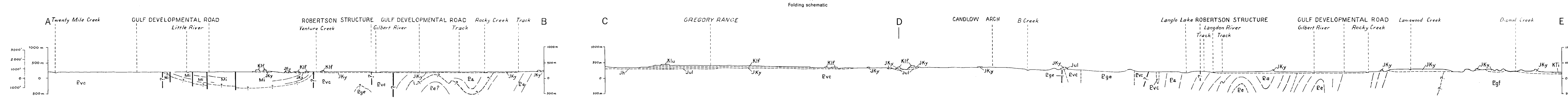
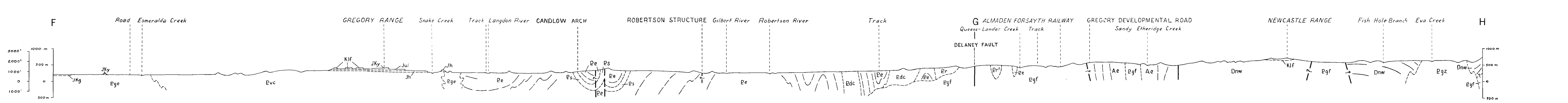
Compiled 1971 by R.S.Needham, M.A.McLaren
Cartography by Geological Branch B.M.R.
Drawn by M.A.McLaren, M.Little

DIAGRAMMATIC RELATIONSHIP OF ROCK UNITS



Sections
Cainozoic sediments omitted
Scale: V/H = 4
Folding schematic





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