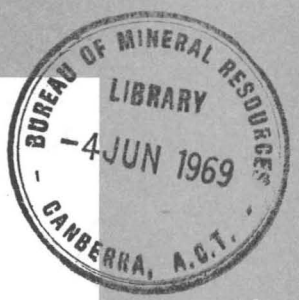
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS



Record No. 1969 / 20

Shallow Stratigraphic Drilling, Northern Eromanga Basin 1963 - 64

by

R.R. Vine and M.C. Galloway

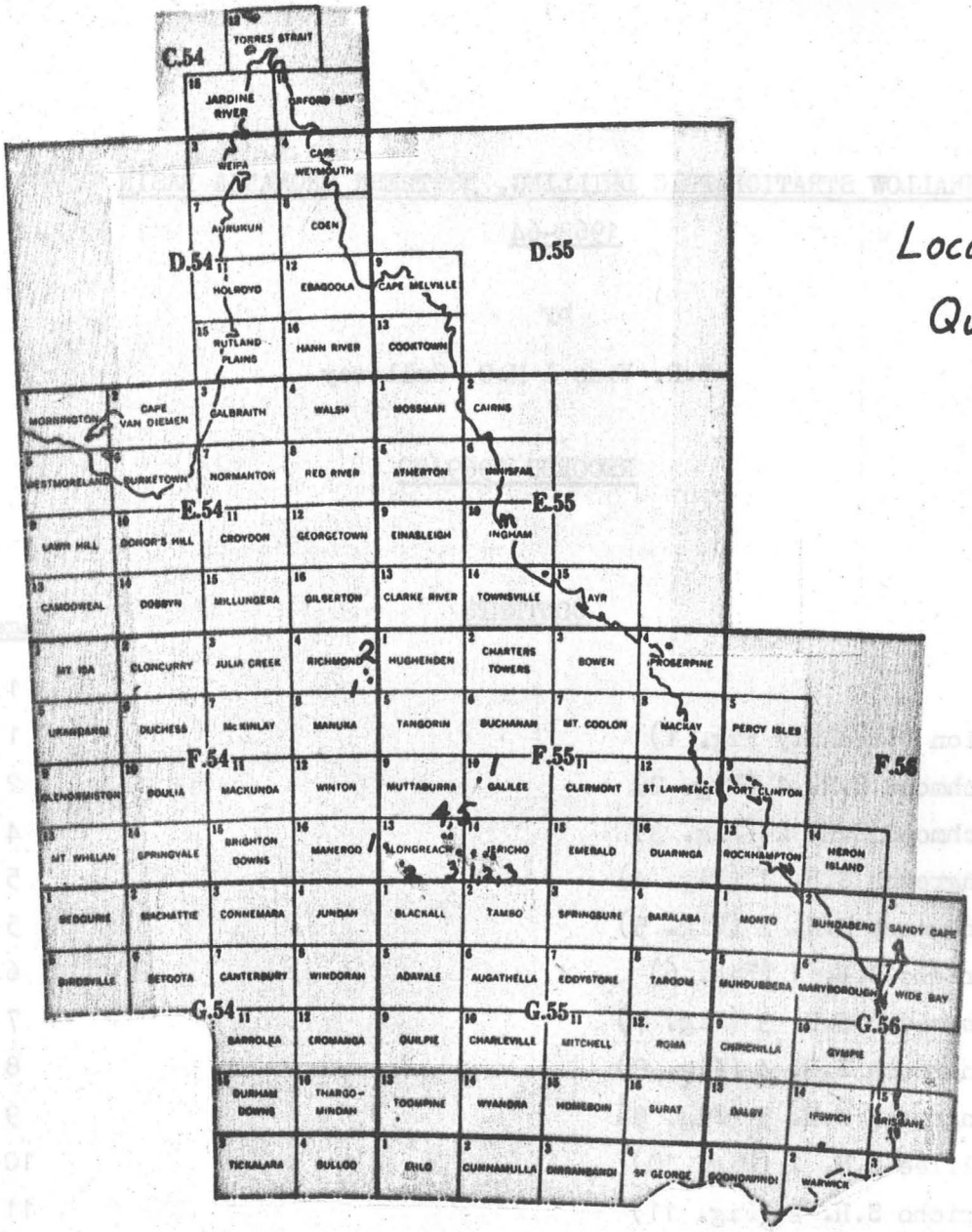
SHALLOW STRATIGRAPHIC DRILLING, NORTHERN EROMANGA BASIN 1963-64

by

R.R. Vine & M.C. Galloway

RECORDS 1969/20

CONTENTS



Locality map - Queensland

Reference for Scout Hole logs

Bedding: ⊏ thick
= thin
≡ laminate
∠ cross-stratified

Gy Gypsum
Gl Glauconite

3 Core number & recovery

Sandstone grain size: f fine
m medium
c coarse

Drilled section: cuttings

FIG. 1 - LOCALITY & REFERENCE

To accompany Records 1969/20
Q/A 217

SHALLOW STRATIGRAPHIC DRILLING, NORTHERN EROMANGA BASIN 1963-64

Records 1969/20

SUMMARY

Shallow stratigraphic drilling was carried out in 1963 and 1964. The programme was designed to supplement surface mapping of poorly-exposed sequences, and to provide fresh rocks for palaeontological study.

The drilling produced long cores, representative of most of the Cretaceous sequence in the northern Eromanga Basin, which confirmed lithological interpretations previously made from rubbly outcrops.

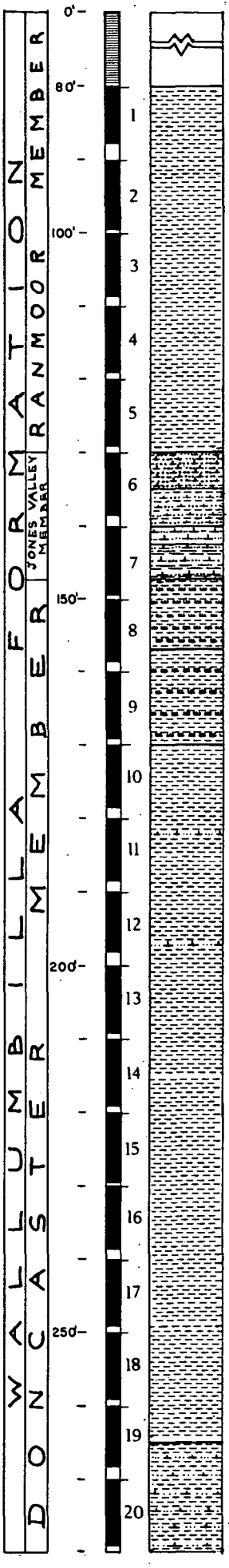
Palaeontological studies showed that fossil collections from the rubbly exposures of the tougher beds are representative of faunas in the sequence. The relationship of rock units to palynological divisions has been established with greater precision than was previously possible.

INTRODUCTION

Shallow stratigraphic drilling was carried out in the northern Eromanga Basin in conjunction with the regional geological mapping during 1963 and 1964. The 1963 drilling was of limited scope, and has not been reported separately, although information derived from it was utilized in compiling the report on the 1963 mapping (Vine, Casey and Johnson, 1964). Some aspects of the 1964 drilling were reported by Vine et al (1965) in discussing stratigraphic problems of the area mapped in 1964.

One of the main problems in regional geological mapping in the northern Eromanga Basin is lack of exposure. Although a good understanding of Cretaceous stratigraphy has developed (Vine & Day, 1965, Vine et al, 1967) it has been based mainly on the mapping of scattered weathered outcrops or rubbly exposures. Many of the stratigraphic relationships, and even much of the lithological description has been based on inference: from rubbly outcrops, from the type of outcrop (or lack of it), or from the relative amounts of rubble remaining after weathering of the various units. The stratigraphic drilling has, therefore, been primarily planned for long, continuously cored intervals to confirm or discredit the inferences drawn.

Fig. 2. B.M.R. RICHMOND SCOUT HOLE NO. 1



0-80' Weathered blue-grey, yellow & buff mudstone, scattered Inoceramus fragments. (Cuttings not collected)

MUDSTONE, dark grey, compact, apparently unbedded; common mica flakes, rare scattered pyrite, slightly calcareous; numerous scattered shell fragments.

at 107' pyrite & calcite filling irregular joint.

CALCAREOUS SILTSTONE, pale grey, slightly friable; quartz 45% feldspar(?) 15%, glauconite/rock fragments 10%, calcareous cement 20%; coarse-grained.

MUDSTONE, as 80-130', & CALCAREOUS SILTSTONE, as 130-135', very thinly interbedded.

CALCAREOUS SILTSTONE, as 130-135'.

MUDSTONE, as 80-130', laminated, & CALCAREOUS SILTSTONE, as 130-135', very thinly interbedded.

MUDSTONE, as 80-130', and CALCAREOUS MUDSTONE, pale grey.

MUDSTONE, as 80-130', with scattered very thin beds of CALCAREOUS MUDSTONE.

MUDSTONE, as 80-130'.

at 182' & 197' very thin beds of calcareous siltstone.

MUDSTONE, dark grey; with very thinly interbedded or interlaminated calcareous and glauconitic SILTSTONE, pale grey, non-fissile, fine-grained and grading to mudstone.

Secondary objects were mainly palaeontological:

(1) to check that macrofaunas in unresistant beds do not differ from those collected from more resistant (generally calcareous) beds;

(2) to provide fresh material for palynological examination in order to relate palynological divisions to the lithological units; and

(3) to provide stratigraphically controlled material in an attempt to establish the foraminiferal succession.

In general the lithological inferences have been validated by the continuous cores, thus giving confidence in the present system of mapping. Macropalaeontological work on the cores by R.W. Day (Australian National University) has supported the observations made on surface samples. The results are included as an appendix to this report. A palynological study is reported by Burger (1968a). Foraminiferal studies have, so far, lagged behind the lithological examination. This has been mainly because the palaeontologists concerned have had more urgent work to do. However, G.R.J. Terpstra (B.M.R.) is in process of carrying out a micropalaeontological examination of the cores; his results will be reported separately.

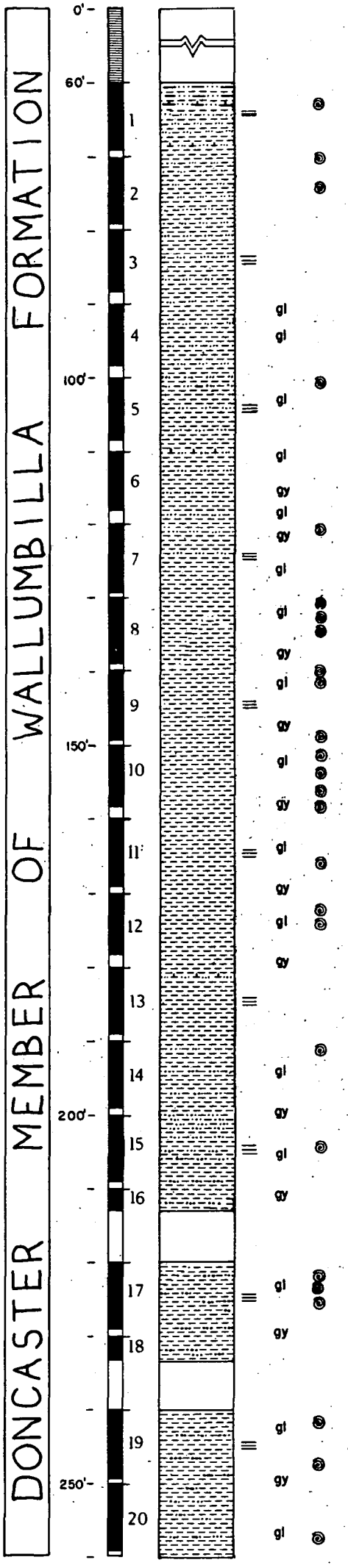
Logging of the cores and cuttings was carried out in the field by members of the field parties (D.J. Casey of Geological Survey of Queensland in 1963 and 1964, and M.C. Galloway, W. Jauncey and R.R. Vine of the Bureau of Mineral Resources in 1964). The rate of logging was controlled by the rate of drilling, and this meant that some logging had to be unduly hurried. All the core was re-logged in detail early in 1965 in Canberra by M.C. Galloway using a X30 binocular microscope. Results of the individual holes are discussed separately below.

Naming of the holes is serial by 1:250,000 sheets, i.e. B.M.R. Richmond S.H.2 refers to the second scout hole drilled by the Bureau of Mineral Resources in the Richmond 1:250,000 Sheet area. Localities of the two holes in the Richmond Sheet area will be shown on the First Edition of the Sheet, localities in Longreach, Jericho and Galilee Sheet areas are shown on the Preliminary Editions. The holes are listed in the order drilled. Approximate locations are shown in Figure 1.

B.M.R. RICHMOND S.H.1. (Figure 2)

Position: RICHMOND, Grid Reference 166399, 17 miles WNW of Hughenden and 5 miles NNW of Boree Railway Station. Started near the top of the Ranmoor Member of the Wallumbilla Formation.

B.M.R. RICHMOND SCOUT HOLE NO. 2.



0-60' Weathered yellow and buff mudstone, changing to grey, blue-grey and green at base.
(Cuttings not collected).

MUDSTONE, with lesser very thinly interbedded or interlaminated SILTSTONE; bedding commonly disrupted, with fragments of one sediment enclosed in the other.
Mudstone: dark grey, non-fissile, rarely slightly glauconitic.
Siltstone: pale green-grey; generally coarse-grained even-grained; angular; commonly glauconitic (up to 30% of sediment), calcareous in some beds.

No recovery, hard drilling, probably limestone.

MUDSTONE, dark grey, non-fissile, with scattered irregular fragments of glauconitic siltstone.

No recovery, hard drilling, probably limestone.

MUDSTONE, dark grey, non-fissile, with scattered irregular fragments of glauconitic siltstone.

Objectives: (a) to obtain a long continuous core in the Ranmoor Member, which normally does not form outcrops.

(b) to relate the lithological divisions of the Wallumbilla Formation (Doncaster, Jones Valley and Ranmoor Members in ascending order) to the Dingodinium cerviculum microplankton zone of Evans (1966).

(c) to investigate a hypothesis of party members that the marked difference between the faunas of the Roma and Tambo Series of Whitehouse (1926, later - 1954 - called 'Formations') is due to lack of collections from a non-outcropping part of the sequence. (Subsequent palaeontological determinations of collections from the Ranmoor Member near Glendower Station later supported this hypothesis - Day, in Vine et al, 1964).

Drilling: Drilled to base of weathered zone (80'), cuttings all mudstone, varying from yellow to buff at top, through increasing proportion of grey, to grey and blue-grey at 80 feet. Due to a misunderstanding cuttings were not collected. Continuously cored for 200 feet to total depth of 280 feet. Top of hole plugged with wood and hole abandoned. No water encountered.

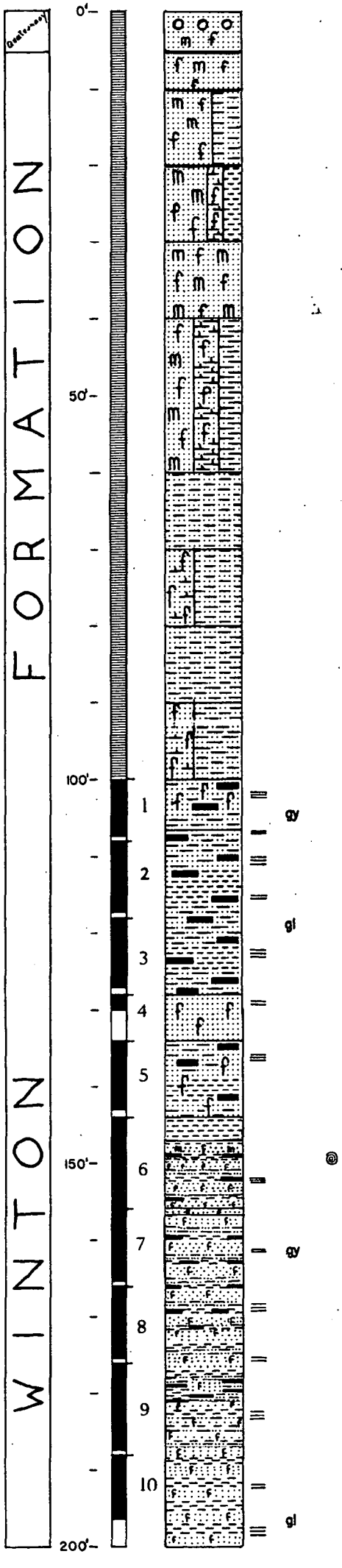
Results: 0-130' Ranmoor Member, mudstone; this confirmed the interpretation from the surface mapping that the Ranmoor Member consists almost entirely of mudstone. The thickness was a little less than expected because it was inferred from interpretation of water-bore drillers' logs that the Ranmoor Member is about 200 feet thick (Vine, Casey and Johnson, 1964).

130'-147'6" Jones Valley Member, calcareous siltstone (coarse-grained) with some interbedded mudstone. Interval is typical of the Jones Valley Member where seen in outcrop except that no limestone present. Somewhat thinner than type section of the member, but the unit was mapped as lenticular.

147'6" - 280'. Doncaster Member, mudstone with minor calcareous mudstone and calcareous siltstone; scattered shell bands. This is the top of the member; it is however, comparable with the lower part seen exposed along the Flinders River, but lacks the common richly glauconitic beds.

Palaeontology: Day (see appendix) reports an Aptian fauna from the Doncaster cores. Faunas in the Ranmoor Member are Albian and probably Lower Albian in the lower part. Palynological studies by Burger (1968a) show that the Doncaster, Jones Valley and lower part of the Ranmoor Member have a K1 b-c microflora while the upper part of the Ranmoor Member has a K1 d microflora. The Doncaster Member and possibly also the Jones Valley Member have microplankton assemblages of the Dingodium cerviculum Zone as redefined by Burger (1968b). The zonal affinities of the microplankton of the lower part of the Ranmoor Member are doubtful, but those in the upper part belong to the Muderongia tetracantha/Odontochitina operculata Zone.

Fig. 4 B.M.R. LONGREACH SCOUT HOLE NO. 1



GRAVEL, in brown, clayey sand matrix; clasts of silicified mudstone and siltstone.

SAND, argillaceous, brown.

SAND, yellow-brown, even-grained;
SILT, brown.

SAND, as 10-20'.
MUDSTONE, pale grey & brown, weathered;
CALCAREOUS SANDSTONE, pale brown & white, labile; drilling rate indicates that it occurs as stringers.

SAND, as 10-20'.

SAND & CALCAREOUS SANDSTONE, as 20-30';
SILTSTONE, brown.

SILTSTONE, brown.

SILTSTONE, as 60-70';

CALCAREOUS SANDSTONE, as 20-30', occurs as stringers.

SILTSTONE, as 60-70'; base of weathering 87'.

SILTSTONE & CALCAREOUS SANDSTONE, as 70-80'.

LITHIC SANDSTONE, pale green-grey; moderately sorted; sub-angular; slightly friable; slightly porous;
SILTSTONE, grey; carbonaceous flakes on bedding planes; occurs as interlaminae;
Coal, as laminae.

Thinly interbedded MUDSTONE, grey, and SILTSTONE, pale grey, with scattered pebbles of mudstone; lenticular laminae of COAL.

LITHIC SANDSTONE, as 100-106'; drilling rate indicates lost core similar.

LITHIC SANDSTONE & MUDSTONE, as above; very thinly interbedded to interlaminated; lenticular laminae of coal.

MUD, grey soft, puggy.

LITHIC SANDSTONE, MUDSTONE & SILTSTONE, as above; COAL in lenticular laminae.

B.M.R. RICHMOND S.H.2 (Figure 3)

Position: RICHMOND Grid Reference 160418, 25 miles NW of Hughenden and 1½ miles from Alderly Homestead on the road to Spring Valley Homestead. Started at the base of the Jones Valley Member of the Wallumbilla Formation.

Objectives: (a) to obtain a long continuous core of the Doncaster Member in a stratigraphic position known in relation to the Jones Valley Member.

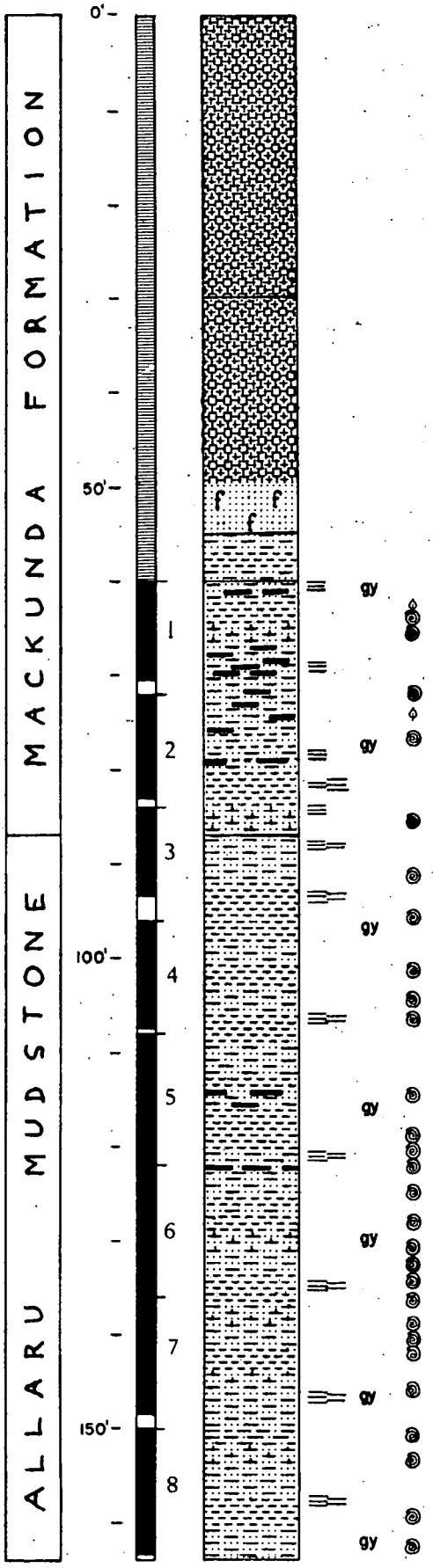
(b) to relate the Doncaster Member to the Dingodinium cerviculum palynological zone.

(c) to check the inference from the surface mapping that beds rich in glauconite are fairly common in the Doncaster Member and diagnostic of the unit.

Drilling: Drilled to base of weathered zone (60'); cuttings mainly mudstone with minor siltstone. Yellow and buff at the top, with increasing proportion of grey, blue-grey and green to 60 feet (cuttings not collected). Continuously cored for 200 feet to total depth of 260 feet. Top of hole plugged with wood and hole abandoned. Very small soakages of water encountered in coarsest beds, but no usable supplies.

Results: 0-260 feet Doncaster Member. Mainly mudstone, with interbedded siltstone (coarse-grained), some calcareous or glauconitic. The glauconitic beds, regarded as diagnostic of the unit, occur throughout. The presence of nodular or concretionary limestone as seen in outcrop is inferred from two intervals of very hard drilling from which no core was recovered. A feature of some of the cores is the presence of fragments of mudstone in a siltstone matrix, or siltstone in a mudstone matrix. This is possibly due to desiccation during temporary emergence or scouring by currents. Some parts of the sequence are gypsiferous, and subsequent to original packing of the core developed a gypsum efflorescence on the surfaces. Day (see appendix) reports an Aptian fauna throughout. Burger (1968a) reports palynomorphs of the Dingodinium cerviculum microplankton zone and spore unit K1 b-c from samples through the member.

Fig. 5. B.M.R. LONGREACH SCOUT HOLE NO. 2.



CLAY, brown, rare blue-grey; soft.

CLAY, as 0-30' but with larger proportion of blue-grey.

LITHIC SANDSTONE, fine-grained, weathered.

MUDSTONE, dark grey.

SILTSTONE, grey, lithic, carbonaceous.

SILTSTONE, with subordinate thinly interbedded MUDSTONE, lesser COQUINITE.
Siltstone: grey; lithic, in part calcareous, rarely carbonaceous;
Mudstone: grey; in part carbonaceous
Coquinite: white; as very thin interbeds or interlaminae.

MUDSTONE, brown, scattered pyrite; with minor very thinly interbedded or interlaminated SILTSTONE, in part calcareous or carbonaceous.

Q/A 221

TO ACCOMPANY RECORDS 1969/20

B.M.R. LONGREACH S.H. 1 (Figure 4)

Position: LONGREACH, Grid Reference 186088, 12 miles WNW of Longreach on the road to Vergemont Homestead. Started in Quaternary gravel.

Objectives: (a) to obtain a long continuous core of the Winton Formation as a check of the interpreted lithology of the unit.

(b) to check that no marine macro or microfossils occur.

Drilling: Drilled to base of weathered zone at 87 feet, and drilled on to 100 feet. Continuously cored for 100 feet to total depth of 200'. Only two short intervals of poor recovery. Top of hole plugged with wood and hole abandoned. No water encountered.

Results: 0-5' Superficial gravel.

5'-200' Winton Formation. The core confirmed that the Winton Formation in this area consists mainly of argillaceous sediments (mudstone and siltstone) with interbedded lithic sandstone and subordinate amounts of coal. Individual sets are mainly very thick.

Palaeontology: A single pelecypod at 149 feet is a freshwater form (see Appendix). No palynological examination has been carried out.

B.M.R. LONGREACH S.H. 2 (Figure 5)

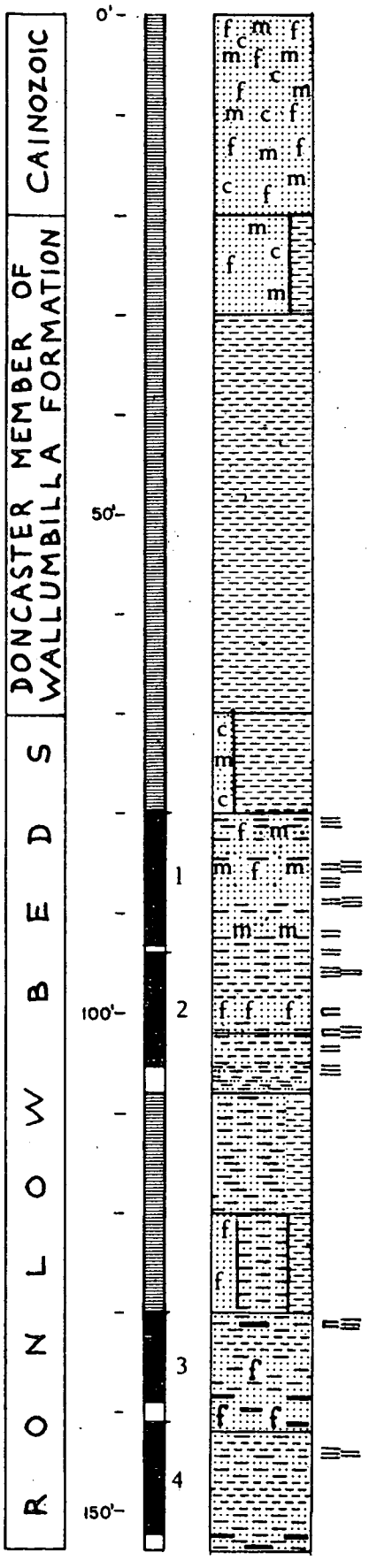
Position: LONGREACH, Grid Reference 233060, 8 miles south of Ilfracombe beside Ilfracombe-Isisford road. Started in the Mackunda Formation.

Objectives: (a) to obtain a long continuous core in the Mackunda Formation as a check of the interpreted lithology of the unit.

(b) to check the distribution of fossils in the rock types of the unit.

Drilling: Drilled to base of weathered zone at 55 feet, and drilled on to 60 feet. Continuously cored for 104 feet to total depth of 164 feet. Recovery good, and core loss not significant. Top of hole plugged with wood and hole abandoned. No water encountered.

Results: 0-87' Mackunda Formation. Cored interval mainly labile siltstone (coarse-grained) with very thinly interbedded mudstone and some coquinite beds; cuttings above have much more clay, and some labile sandstone.



SAND, argillaceous, quartzose.

SAND, as 0-20'.

MUDSTONE, tough, red & pale grey.

MUDSTONE, pale green-grey, pink and red where weathered, weathering decreases downwards.

MUDSTONE, pale green-grey.

SANDSTONE, blue-grey, poorly sorted with grains up to granule size, argillaceous.

Interbedded sequence of SILTSTONE, SANDSTONE & MUDSTONE
Siltstone: grey, quartzose to labile, kaolinitic in part, carbonaceous in part
Sandstone: pale grey; quartzose to sub-labile; fine to medium grained; moderately sorted, variably argillaceous
Mudstone: dark grey, carbonaceous

SILTSTONE & MUDSTONE, interlaminated; pale to dark grey.

SILTSTONE, grey, clayey, carbonaceous

MUDSTONE, grey, carbonaceous, scattered mica.

SILTSTONE, as 108-120'
MUDSTONE, as 108-120'
SANDSTONE, pale grey speckled with black coaly grains, argillaceous

Interbedded SANDSTONE, SILTSTONE & MUDSTONE as 80-102'; but discontinuous coal laminae common and discrete coal grains occur in sandstone.

SILTSTONE & MUDSTONE, as 102-106'.

87'-164' Allaru Mudstone, mainly mudstone, with interlaminated or very thinly interbedded siltstone, in part carbonaceous.

Encountering the Allaru Member was unexpected, but it enabled a fresh structural interpretation of the area to be made and thereby resolved some mapping problems. The new structural interpretation was later substantiated by structural contours of the base of the Wallumbilla Formation, drawn from the interpretation of drillers' logs (Vine, Jauncey, Casey & Galloway, 1965). However, it means that a long continuous core of the Mackunda Formation in the northern Eromanga Basin has not yet been obtained.

Palaeontology: Day (see appendix) noted that there is practically no difference between the faunas of the Mackunda Formation and Allaru mudstone in this hole, and that the faunas are probably Upper Albian. Burger (1968a) found no microplankton in cores examined from the Mackunda Formation, and in only one of the two cores examined from the Allaru Mudstone; these are from the Odontochitina operculata Zone. Spores in both units are from spore unit K2.

B.M.R. JERICHO S.H. 1 (Figure 6)

Position: JERICHO, Grid Reference 356064, 20 miles east of Barcaldine, beside the Capricorn Highway. Started in superficial Cainozoic sediments.

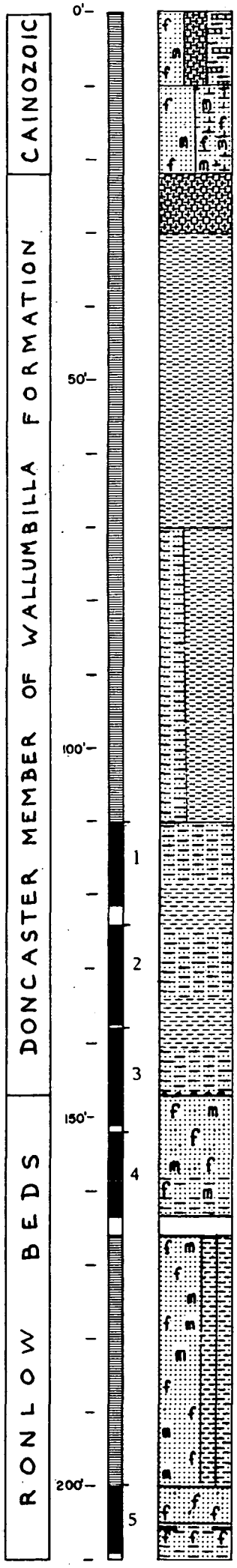
Objectives: (a) to obtain a long continuous core of the lower part of the Doncaster Member of the Wallumbilla Formation in the Barcaldine area for lithological and palaeontological study.

(b) to obtain a core of the contact between the Wallumbilla Formation and the Ronlow Beds.

(c) to examine the upper part of the Ronlow Beds.

Drilling: Drilled to base of weathered zone at 80 feet, but top of Ronlow Beds encountered at about 70 feet. Cored to 108 feet in top of Ronlow Beds. Drilled on to 130 feet in Ronlow Beds. Cored to total depth of 154 feet in Ronlow Beds. Good supply of fresh water encountered between 70 and 80 feet rose to about 20 feet. Hole plugged with wood and abandoned.

Fig. 7 B.M.R. LONGREACH SCOUT HOLE NO. 3



SAND, brown, quartzose;
SILTY CLAY;
LIMESTONE & CALCAREOUS SANDSTONE

QUARTZOSE SANDSTONE, white, argillaceous;

CALCAREOUS SANDSTONE, white & varicoloured; quartzose

CLAY, ochre, soft, puggy.

MUDSTONE, dark to pale grey, weathered red, weathering decreases downwards; in part carbonaceous.

MUDSTONE, as above;

SILTSTONE, grey; coarse grained grading to very fine-grained sandstone;
Base of weathering 100'.

MUDSTONE, dark blue-grey to black; slightly carbonaceous, slightly micaceous;
scattered near-vertical, pyrite-lined pipes of white silt;
scattered steep veins (up to ¼") of gypsum;

SILTSTONE, pale grey & pale green; commonly as lenticular laminae. Near-vertical sandstone dykes up to 1" wide in basal 7'
At Base: 1" quartzose sandstone, coarse-grained; overlying 1" conglomerate, with chert pebbles in sub-labile sand matrix.

SUB-LABILE to QUARTZOSE SANDSTONE, grey, coarse & medium-grained; poor to moderately sorted; angular & sub-angular; argillaceous;

SILTSTONE, grey; interlaminated.

QUARTZOSE SANDSTONE, pale grey;

MUDSTONE, dark blue-grey;

SILTSTONE, dark blue-grey & pale grey.

LABILE SANDSTONE, pale grey; slightly friable; slightly porous; include coal grains (5%).

SILTSTONE, pale brown; with scattered carbonaceous wood fragments; very thinly interbedded LABILE SANDSTONE, as 200-205'.

Results: 0-20' (approx.) argillaceous sand of superficial Cainozoic sediments; presumed cavings of sand form bulk of cuttings in interval 20-30 feet.

20-70' (approx.) weathered mudstone of Doncaster Member.

70' - T.D. Ronlow Beds. Top picked by first appearance of sandstone cuttings. Mainly sandstone and siltstone in first cored interval (80'-108'). Cuttings to 130' mainly argillaceous so further cores taken; these mainly sandstone, with minor interbedded argillaceous sediments and coal laminae. The Ronlow Beds were encountered higher than expected, so the first two objectives were not achieved. However the hole provided good structural control and gave evidence of the continuation of the Barcaldine Ridge (Vine et al, 1965) on to JERICHO.

Palaeontology: No palaeontological examination has been carried out; no macrofossils are evident.

B.M.R. LONGREACH S.H. 3 (Figure 7)

Position: LONGREACH, Grid Reference 342065, 12 miles east of Barcaldine beside the Capricorn Highway. Started in Cainozoic outwash sediments.

Objectives: Drilled subsequently to B.M.R. Jericho S.H. 1 and 8 miles west of it, in an attempt to obtain -

(a) a long continuous core of the lower part of the Doncaster Member of the Wallumbilla Formation in the Barcaldine area for lithological and palaeontological study.

(b) a core of the contact between the Wilgunya Formation and the underlying arenite sequence.

Drilling: Drilled to base of weathered zone at 100' and drilled on to 110 feet. Continuously cored to 166 feet (through the base of the Wilgunya Formation). Drilled on to 200 feet. Took bottom hole core from 200 feet to total depth of 210 feet. Top of hole plugged with wood and hole abandoned. Small supply of slightly brackish water at 22 feet. Good supply of fresh water at about 150 feet, rose to about 20 feet.

Results: 0-22' Superficial Cainozoic sediments (sand, clay, limestone, calcareous sandstone).

22'-147' Doncaster Member. Weathered to clay at top, but mainly mudstone with lenticular very thinly interbedded siltstone. 2 inches of pebbly sandstone and conglomerate at base.

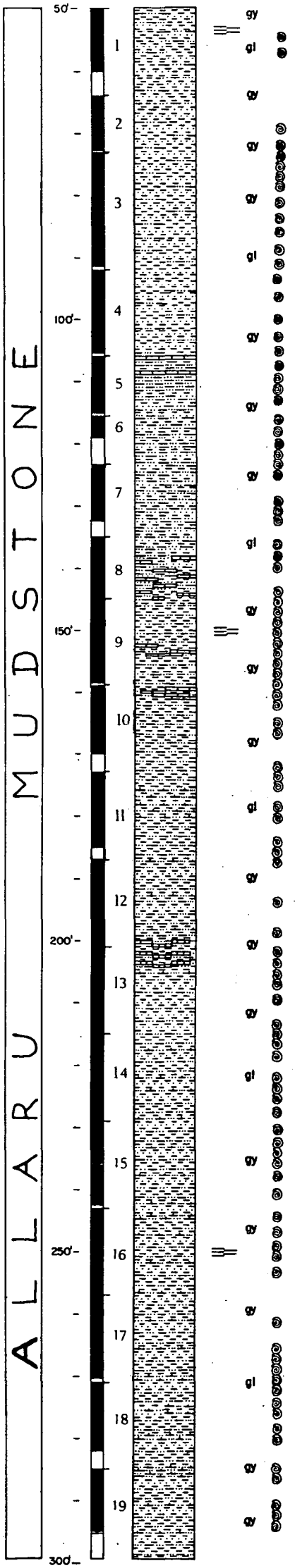
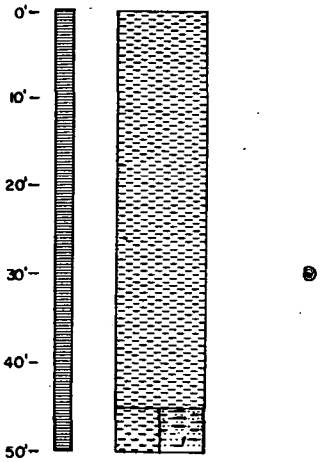


Fig. 8 B.M.R. LONGREACH SCOUT HOLE NO. 4



MUDSTONE, brown, weathered; scattered gypsum chips.

MUDSTONE, grey-blue;
SILTSTONE, grey

MUDSTONE, dark grey; scattered carbonaceous plant fragments;

SILTSTONE, grey, lithic, grading to very fine-grained lithic sandstone, in part glauconitic; some beds calcareous; occurs as irregular very thin beds or laminae in the mudstone.

Some COQUINITE beds between 92 & 106'; lenses of LIMESTONE and seams of CONE-IN-CONE LIMESTONE, mainly between 133 & 161', and between 199 & 204'.

Q/A 224

TO ACCOMPANY RECORDS 1969/20

147'-218' Ronlow Beds, sub-labile, labile and quartzose sandstone, with subordinate mudstone and siltstone. Core 2 (94-108') stuck in the barrel, presumably due to swelling clays in the matrix of the sandstone. The sharp change marked by a thin conglomeratic phase from an arenite sequence to an argillaceous sequence is indicative of a disconformity, other evidence for which was obtained during the surface mapping.

Palaeontology: Day (see appendix) found only fragments of Inoceramus in the Doncaster Member. He also recorded plant fragments and a single freshwater pelecypod in the Ronlow Beds.

A palynological study was carried out by Evans (1966). . . It showed that the base of the Doncaster Member (at 146 feet) contains abundant microplankton of the Dingodinium cerviculum zone (palynological division K1 b-c) whereas a mudstone stringer in the top of the Ronlow Beds only 10 feet below contains only rare microplankton. The spores in the lower sample are of palynological division K1 a or b but this part of the sequence has not yet been studied in sufficient detail to show if there is any significant age difference in the two assemblages.

Spores from the bottom part of the hole, at 209' are probably of palynological division J5, which in the Tambo area includes the Adori Sandstone and most of the Westbourne Formation. Thus as this core is only about 60 feet below ones containing a K1 microflora there is evidence either of very slow sedimentation or of one, possibly more, disconformities.

B.M.R. LONGREACH S.H. 4 (Figure 8)

Position: LONGREACH Grid Reference 307104, 24 miles NNW of Barcaldine and 4 miles west of Bowyer railway station. Started in Allaru Mudstone.

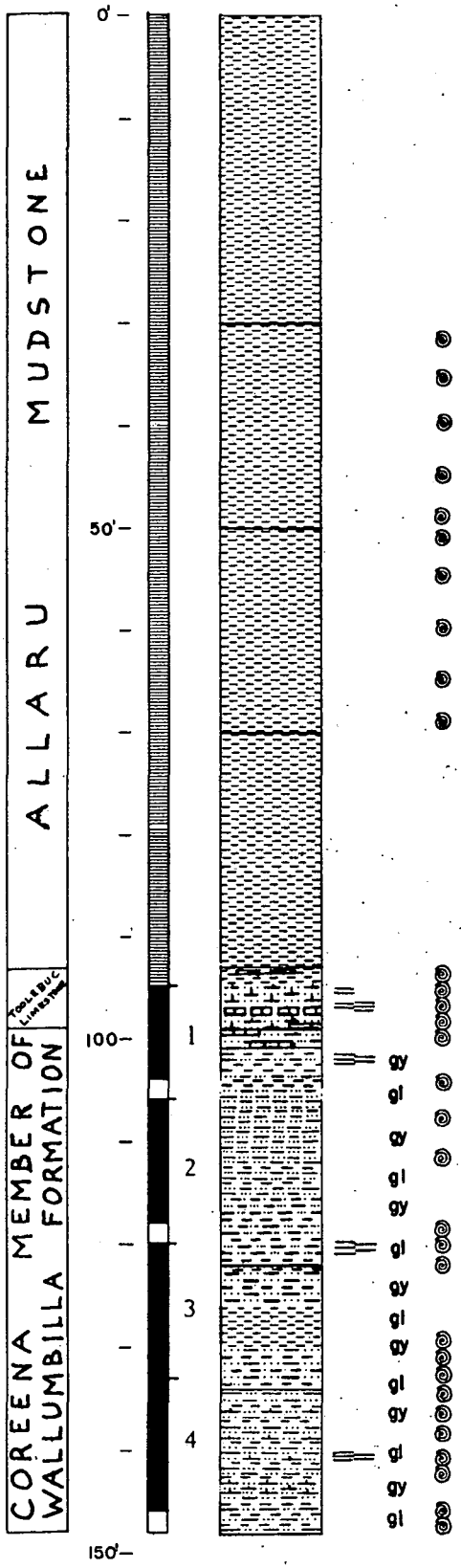
Objectives: (a) to obtain a long continuous core of the Allaru Mudstone for lithological and palaeontological study.

(b) to core the Toolebuc Limestone in order to establish the thickness in this area and to find out why the member is seldom noticed by water bore drillers.

Drilling: Drilled to base of weathered zone at 45 feet, drilled on to 50 feet. Continuously cored for 254 feet to total depth of 299 feet. Plugged with wood and abandoned. No water encountered.

Fig. 9

B.M.R. LONGREACH SCOUT HOLE NO. 5



MUDSTONE, brown & grey, scattered gypsum chips.

MUDSTONE, brown & grey, scattered Inoceramus prisms.

MUDSTONE, brown & grey, scattered gypsum chips, carbonaceous fragments and Inoceramus prisms.

MUDSTONE, brown & grey.

CALCARENITE & MUDSTONE, grey; scattered Inoceramus prisms.

Very thinly interbedded LIMESTONE & CALCAREOUS SILTSTONE, with 2" of CALCARENITE, at top.
Limestone: white, silty, scattered Inoceramus fragments;
Siltstone: dark grey to black; scattered limestone & shell fragments
Calcarenite: coarse to very coarse-grained; clasts of limestone and shell fragments.

Interbedded LITHIC SANDSTONE (grading to coarse-grained SILTSTONE) and MUDSTONE.
Sandstone: pale grey; very fine-grained; angular; friable; in part glauconitic, scattered carbonaceous fragments, some pyrite
Mudstone: grey; scattered plant fragments; some carbonaceous laminae

Interlaminated SILTSTONE & MUDSTONE, similar to 99-122', but generally finer-grained interval; black, puggy mud from 127-130'.

LITHIC SANDSTONE/SILTSTONE & MUDSTONE, as 99-122'; some laminae of CALCAREOUS SILTSTONE.

Q/A 225

TO ACCOMPANY RECORDS 1969/20

Results: 0-299 feet Allaru Mudstone. Mudstone and siltstone, with very minor labile sandstone, scattered lenticular limestone and thin cone-in-cone limestone. The drilled thickness of the Allaru Member was considerably greater than expected from the position of the hole in the outcrop belt of the unit. The hole had to be abandoned without reaching the Toolebuc Member due to depth limitations enforced by the amount of drill pipe carried.

Great difficulty was experienced in extracting many of the cores from the core barrel, presumably due to swelling of montmorillonite when wetted by the drilling fluid.

At depths of 246' and 250' gas bubbles appeared in the drilling mud and burst to give oily slicks. Analysis failed to substantiate the presence of hydrocarbons, and the oily slicks are interpreted as being due to finely disseminated carbonaceous matter.

A noticeable feature of the core from this hole is the large amount of plant debris which occurs throughout, but particularly above 200 feet depth. This is also noticeable in the rubble of the Allaru Mudstone which occurs at the surface in the Longreach area.

Palaeontology: Day (see appendix) records a typically Albian fauna of pelecypods and ammonites in the Allaru Mudstone. Shelly fossils are common.

Burger (1968a) recorded palynomorphs of spore unit K2 and microplankton zone Odontochitina operculata throughout. Microplankton form between 28 and 47% of the assemblages.

B.M.R. LONGREACH S.H. 5 (Figure 9)

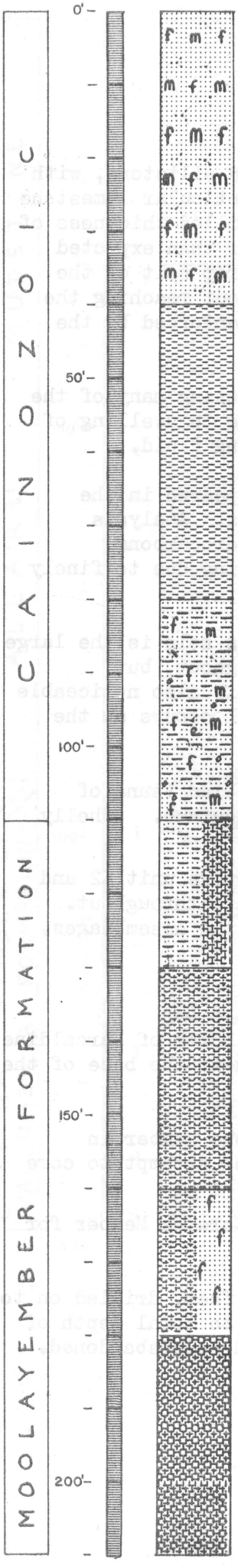
Position: LONGREACH Grid Reference 313103, 22 miles north of Barcaldine, 3 miles east of B.M.R. S.H. 4. Started near the base of the Allaru Member.

Objectives: (a) Following the failure to reach the Toolebuc Member in B.M.R. Longreach S.H. 4 this was a further attempt to core the Toolebuc Member.

(b) to obtain a long continuous core of the Coreena Member for lithological and palaeontological study.

Drilling: Drilled to base of weathering zone at 70 feet, drilled on to 95 feet. Continuously cored for 53 feet to total depth of 148'. Top of hole plugged with wood and hole abandoned. No water encountered.

Fig. 10 B.M.R. GALILEE SCOUT HOLE NO. 1



QUARTZOSE SANDSTONE, with plentiful argillaceous material; brown & grey; mainly fine to very fine-grained, scattered coarse grains.

MUDSTONE, ferruginous (red-brown) and leached (white), probably originally mottled; scattered fine sand grains; some mudstone sandy, with opaline silica cavity-fillings.

SILTY QUARTZOSE SANDSTONE & SANDY SILTSTONE, leached (white); very fine to medium sand grains, with rare small quartz pebbles below 90'.

SILTSTONE, ferruginous; red; with medium quartz grains (?cavings);

CLAY, red & white, puggy; proportion of siltstone decreases downwards.

CLAYSTONE, white, some red & puggy; scattered fine & very fine sand grains.

CLAYSTONE, pale grey, some yellow-brown;

QUARTZOSE SANDSTONE, pale grey; fine & very fine-grained.

CLAY, pale grey & brown, scattered fine sand grains.

Q/A 226

TO ACCOMPANY RECORDS 1969/20

Results: 0-93 feet Allaru Mudstone. Cuttings of mudstone.

93-99 feet Toolebuc Limestone. Very thinly interbedded platy limestone and calcareous siltstone.

99-148' Coreena Member of Wallumbilla Formation. Interbedded very fine-grained sandstone (gradational to coarse-grained siltstone) and mudstone. The drilling confirmed that the Toolebuc Member is very thin in this area, and that in the subsurface it is very similar in appearance to the rubble of very thin platy limestone exposed at the surface. The thinness of the Toolebuc Member together with the thinness of the individual limestone beds give a good indication why most water-bore drillers do not record in their logs any change in the drilling.

The drilling also confirmed the large proportion of sandstone/siltstone in the Coreena Member. It thus justifies the lithological distinction from the Ranmoor Member, which occupies a similar stratigraphic position.

Palaeontology: Day (see appendix) notes that the Toolebuc Limestone is crammed with fragments of large Inoceramus and separated valves of the pelecypod Aucellina hughendenensis. The fauna of the Coreena Member is Albian.

Burger (1968a) records palynomorphs of spore unit K2a and microplankton zone Odontochitina operculata throughout. The proportion of microplankton is 3% or less, except for one sample which consists dominantly of Leiosphaerids.

B.M.R. GALILEE S.H. 1 (Figure 10)

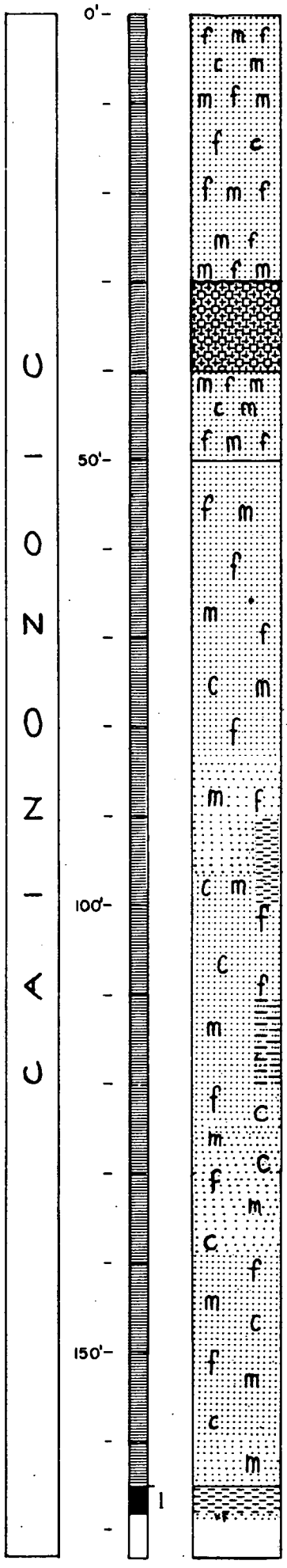
Position: GALILEE, Grid Reference 383207, 49 miles north-east of Aramac. Started in Cainozoic sediments.

Objectives: (a) to obtain cores from the lower part of the Ronlow Beds.

(b) to examine the inferred unconformity between the Ronlow Beds and the Moolayember Formation.

Drilling: Drilled to total depth of 210 feet in weathered sediments. Hole drilled entirely with air because water tanker had broken down en route to site. Eventually hole had to be abandoned because of technical difficulties caused by water encountered. Water supplies : Small supply of fresh water encountered at 95'; larger supply (driller's estimate 500 g.p.h.) of brackish to salty water between 100' and 110'.
Hole left open at request of manager of Fleetwood Station after signed undertaking obtained that he would either abandon or complete the hole in accordance with the requirements of the Irrigation and Water Supply Commission.

Fig. 11 B.M.R. JERICHO SCOUT HOLE NO. 2



QUARTZOSE SAND, yellow-brown to red, very fine to coarse-grained, generally poorly sorted, silty or clayey; some small rounded pebbles of ironstone and sandstone at base.

SILTY CLAY, grey, damp; some fine sand grains.

QUARTZOSE SAND, as 0-30'.

SANDSTONE & MUDSTONE; sandstone grey & red fine to coarse-grained, silty; mudstone grey-pink, cherty; some loose sand.

MUDSTONE, variegated white, pink, purple; puggy. At base 2" SANDSTONE, white-pink; very fine-grained; well sorted, but with clay matrix; angular, friable.

Q/A 227

TO ACCOMPANY RECORDS 1969/20

Results: 0-110' Cainozoic sediments, mainly poorly sorted, mixed argillaceous and arenaceous sediments; probably mainly Tertiary.

110-210' Moolayember Formation, apparently drilled through a thick weathered profile in a dominantly argillaceous sequence. The Cainozoic sequence was much thicker than expected and precluded drilling the Ronlow Beds. However the hole showed that the subcrop of the Ronlow Beds is much further west than expected from the few exposures to the south. The thick weathered profile in the Moolayember is similar to a laterite profile, but lacks the marked induration (and, possibly, silicification) evident in exposed profiles.

Palaeontology: No palaeontological examination was carried out.

B.M.R. JERICHO S.H. 2 (Figure 11)

Position: JERICHO Grid Reference 377665, beside Capricorn Highway, near Alice River, 34 miles east of Barcaldine. Started in Cainozoic sediments.

Objectives: To obtain a long continuous core in the lower part of the Ronlow Beds.

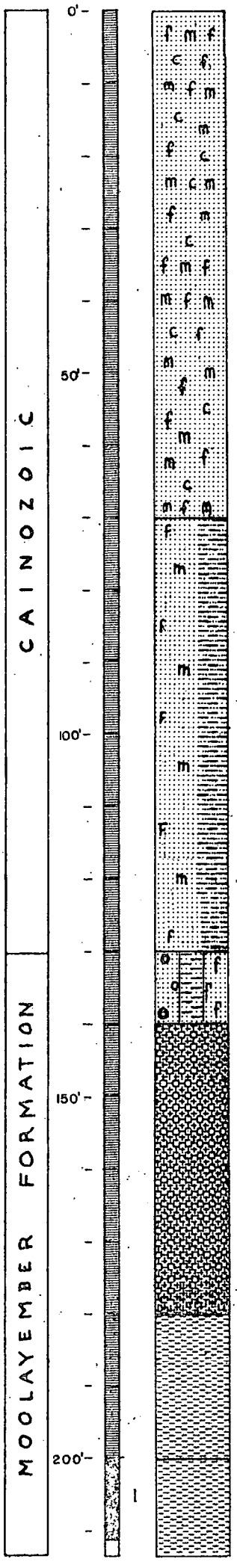
Drilling: Drilled to 165 feet, cored to total depth of 173 feet. Hole plugged with wood and abandoned. Small supplies of brackish water at intervals throughout hole.

Results: Superficial sediments, mainly arenaceous, throughout drilling. Mainly poorly consolidated to 50', indurated thereafter. The hole indicated that thick Cainozoic sediments, probably of both Tertiary and Quaternary age, occur in a belt which is followed by the present Alice River.

The hole was abandoned because of the unexpected thickness of Cainozoic sediments. Reinterpretation following the drilling of B.M.R. 3A indicates that the lutites in the bottom of the hole may be Moolayember Formation, and that the Ronlow Beds are much thinner on the Barcaldine Ridge than originally expected.

Palaeontology: No palaeontological examination was carried out.

B.M.R. JERICHO SCOUT HOLES 3 & 3A



QUARTZOSE SANDSTONE, red-brown, ferruginous; fine to medium-grained with scattered coarse, angular quartz grains.

SANDSTONE & SILTSTONE; sandstone red, white, medium & fine-grained, silty; siltstone silicified.

GRAVEL, quartzose, with pebbles up to ¼", angular & sub-rounded
SILTSTONE, lilac, lithic, first appeared between 130 & 140'
SANDSTONE, SAND & IRONSTONE, red, fine-grained, probably cavings.

CLAY, with probable cavings of sandstone & sand; clay soft, yellow, puggy.

MUDSTONE, yellow at top, grey and harder from 190'; probable cavings of sandstone & sand. Alternating hard & soft drilling 190-200'.

MUDSTONE, variegated blue, red-brown, blue-grey, purple, grey-green; very soft, puggy & greasy when wet; fissile in part.

G/A 228

TO ACCOMPANY RECORDS 1969/20

B.M.R. JERICHO S.H.s 3 & 3A (Figure 12)

Position: JERICHO Grid Reference 382064, beside Capricorn Highway, 2 miles east of B.M.R. Jericho S.H. 2, and 36 miles east of Barcaldine. Started in Cainozoic sediments.

Objective: As for B.M.R. Jericho S.H. 2. The hole was sited on a rise east of Jericho S.H. 2 in the hope that the thick Cainozoic sediments encountered in that hole were confined to the valley of the Alice River.

Drilling: B.M.R. Jericho 3 was drilled with air to 155 feet, where further drilling was hampered by the poor condition of the hole. B.M.R. 3A was then drilled alongside with mud.

Drilled to 200 feet in superficial and weathered sediments; cored to 213'6".

Small supplies of brackish water encountered at intervals to 130 feet. Hole plugged with wood and abandoned.

Results: 0-130' Unconsolidated Cainozoic sediments, mainly arenaceous, but with pebbles at base.

130-213'6" Moolayember Formation; mostly varicoloured mudstone, with abundant cavings of the Cainozoic sediments. Thick Cainozoic sediments were again encountered in this hole. Below 150' it became evident that the Moolayember Formation was being drilled, but drilling continued while the cuttings appeared weathered.

After cutting the core a major component of the rig broke and could not be replaced for several days; the hole was therefore abandoned and the programme terminated.

Palaeontology: The bottom hole core was examined for spores, but was barren (Evans, 1966).

CONCLUSIONS

Long cores representative of most of the Cretaceous sequence of the northern Eromanga Basin have now been obtained, and are available for examination at theB.M.R. Core and Cuttings Laboratory, Canberra.

Attempts to get representative material from the Jurassic sequence of the Jericho area were less successful. It is an area of extremely poor outcrop, where siting of good holes is difficult; in addition there are widespread Quaternary and Tertiary sediments which are much thicker than was expected.

Palaeontological studies showed that fossil collections from rubbly outcrops of calcareous beds are representative. The continuously cored sections in critical stratigraphical levels enabled the boundaries

of several palynological divisions to be determined with greater precision than had previously been possible.

REFERENCES

BURGER, D., 1968a - Palynology of marine Lower Cretaceous strata in the northern and eastern Eromanga Basin, Queensland. Bur. Miner. Resour. Aust. Rec. 1968/62 (unpubl.).

BURGER, D., 1968b - Relationship of palynology to stratigraphy in the Lower Cretaceous of the Surat Basin in Queensland. Bur. Miner. Resour. Aust. Rec. 1968/125 (unpubl.).

EVANS, P.R., 1966 - Palynological studies in the Longreach, Jericho, Galilee, Tambo, Eddystone and Taroom 1:250,000 Sheet areas, Queensland. Bur. Miner. Resour. Aust. Rec. 1966/61 (unpubl.).

VINE, R.R., CASEY, D.J. and JOHNSON, N., 1964 - Progress report, 1963, on the geology of part of the north-eastern Eromanga Basin, Queensland. Bur. Miner. Resour. Aust. Rec. 1964/39 (unpubl.).

VINE, R.R. and DAY, R.W., 1965 - Nomenclature of the Rolling Downs Group, northern Eromanga Basin. Qld Govt Min. J. 66, 416-421.

VINE, R.R., DAY, R.W., CASEY, D.J., MILLIGAN, E.N., GALLOWAY, M.C. & EXON, N.F., 1967 - Revision of the nomenclature of the Rolling Downs Group in the Eromanga and Surat Basins. Qld Govt Min. J. 68, 144-151.

VINE, R.R., JAUNCEY, W., CASEY, D.J. and GALLOWAY, M.C., 1965 - Geology of the Longreach-Jericho-Lake Buchanan area, Queensland. Bur. Miner. Resour. Aust. Rec. 1965/245 (unpubl.).

WHITEHOUSE, F.W., 1926 - The Cretaceous ammonoidea of eastern Australia. Mem. Qld Mus. 8, 195-242.

WHITEHOUSE, F.W., 1954 - The geology of the Queensland portion of the Great Australian Artesian Basin. App. G to Artesian water supplies in Queensland. Dept. Co-ord. Gen. Pub. Works.

APPENDIX

LOWER CRETACEOUS MACROFOSSILS FROM B.M.R. SCOUT HOLES RICHMOND 1 & 2, AND LONGREACH 1,2,3,4 & 5.

by R.W. Day (Australian National University).

B.M.R. RICHMOND S.H. 1

Ranmoor Member

80'6" - 80'6½"	Small trigonal shaped pelecypods (? Barcoona trigonalis (Moore))
85'1" - 85'1½"	Nuculana cf. randsi Etheridge Jnr.
89'6" - 89'6½"	Aconeceras sp.
91'3" - 91'4"	Aconeceras sp.
93' - 93'1"	Nuculana cf. randsi Etheridge Jnr.
96'4" - 96'5½"	Aconeceras sp.
100'3" - 100'4"	Aucellina sp. ind.
110'8" - 111'	Aucellina cf. hughendenensis (Etheridge Jnr.)
121'9" - 121'10"	Aucellina sp. ind.

Remarks:

The ammonite Aconeceras sp. is represented by small, well preserved specimens, showing high, crenulate keels. They closely resemble those reported as Aconeceras sp. by Day (1964) from GAB668 in the lower part of the Ranmoor Member near Glendower. The present specimens occur 33'8" - 40'6" above the top of the Jones Valley Member in this hole. The occurrence of Aconeceras sp. indicates that the sediments of this interval are probably the same age (Lower Albian) as those near Glendower.

Aucellina cf. hughendenensis is represented by a posteriorly incomplete right valve and several small left valves. All show strong radial ornament. Small left valves designated Aucellina sp. ind. do not show ornament clearly. Aucellinas like A. hughendenensis also occur in the lower part of the Ranmoor Member on Glendower Station.

Two small left valves and a right valve designated Nuculana cf. randsi are posteriorly rostrate and superficially resemble Nuculana (? Yoldia) randsi Etheridge (1892, pl.26, fig.10) from the Aptian Maryborough Formation. No comparable specimens have been observed in previous collections from the Ranmoor Member.

Several small pelecypods found in the interval 80'6" - 80'6½" are difficult to characterize owing to their morphological simplicity. Barcoona trigonalis, a species which forms coquinas in the Coreena Member in the Longreach, Tambo and Augathella areas, is somewhat similar. If referable to this species the present specimens would provide the first record of Barcoona trigonalis in the Ranmoor Member.

Doncaster Member

151'6" - 151'8" Indet. pelecypod shell fragments
153'8" - 153'9" "Cucullaea" sp. ind.
154'7" - 154'9" Maccoyella subangularis ? Etheridge Jnr.
157'4" Indet. large pelecypod shell fragment
159' Indet. pelecypod shell fragments
159'8" Indet. large pepecypod shell fragment
174'5" - 174'7" Pseudavicula anomala (Moore)
181'7" - 181'8" Indet. small pelecypods
184'3" - Indet. pelecypod fragments
191'8" - 191'9" Maccoyella corbiensis (Moore)
252'7" - 252'9½" Panopea maccoyi (Moore)
260'8" - 260'11" Lingula cf. subovalis Davidson
261'2" - 261'3" Lingula cf. subovalis Davidson
263'9" - 263'11" Lingula cf. subovalis Davidson
Maccoyella sp. ind.
265'5" - 265'6½" Nuculana randsi ? Etheridge Jnr.
268'11" Lingula cf. subovalis Davidson
269'11" - 270' Indet. trigoniid
277'7" - 277'8" Lingula cf. subovalis Davidson
Panopea maccoyi (Moore)

Remarks:

The occurrence of the typical Roma pelecypods Pseudavicula anomala and Maccoyella corbiensis indicates an Aptian age for this interval. Both species occur commonly in outcrops of the Jones Valley, and Doncaster Members in the Richmond-Hughenden area. In this core Pseudavicula anomala and Maccoyella corbiensis are each represented by single, well preserved right valves.

A left valve doubtfully identified as Maccoyella subangularis Etheridge Jnr (=Avicula substriata Moore non Zieten) has the expanded posterior wing of this species, but the ornament is obscure.

Two small specimens are identified with Panopea maccoyi rather than P. rugosa, as they have anterior umbones. The latter has been reported from a number of localities in the Jones Valley and Doncaster Members of the Hughenden - Richmond area, but the record of the former is a new one for this area.

A left valve doubtfully identified with Nuculana randsi is incomplete anteriorly, but may represent this Aptian species.

The indeterminate trigoniid found in the interval 269'11" - 270' is represented by two incomplete specimens. These lack cinctures and so are not members of the Nototrigonia group.

"Cucullaea" sp. ind. is represented by a small umbonally incomplete specimen which cannot be identified specifically.

The brachiopod Lingula cf. subovalis is much more abundant in this hole than in any outcrops in the area. A few specimens were previously reported by Day (1964) from GAB1139 & 1140 in the Jones Valley Member near Glendower. A probable Aptian interval in A.A.O. Penrith No. 1 (2,250'-2, 262') also contained abundant Lingula cf. subovalis (Day, 1962).

B.M.R. RICHMOND S.H. 2

Doncaster Member

63' - 63'1" Lingula cf. subovalis Davidson
70'3" - 70'4" ? Cyrenopsis sp. ind.
74'7" - 74'8" Indet. large pelecypod
75'2" - 75'2½" Maccoyella subangularis ? Etheridge Jnr.
100'9" - 100'10½" Peratobelus oxys (Tenison-Woods)
120'6" - 120'7½" Lingula cf. subovalis Davidson
129'1" - 129'2½" Lingula cf. subovalis Davidson
132'8" - 132'10" Lingula cf. subovalis Davidson
133'3" - 135'5" Lingula cf. subovalis Davidson
135'1" - 135'3" Lingula cf. subovalis Davidson
Indet. belemnite
141'4" - 141'5½" Camptonectes sp. ind.
Indet. large pelecypod shell
148'6" Indet. large pelecypod shell
151' Indet. large pelecypod shell
152'4" - 152'4½" "Nucula" cf. "N" sp. 1
155'6" Indet. large pelecypod shell
156'7" - 156'10" Acteon cf. hochstetteri Moore
157'9" - 158' Decapod crustacean claw
158'2" Indet. pelecypod shell fragments
165'2" - 165'4½" Lingula cf. subovalis Davidson
Pseudavicula anomala (Moore)
166'4" Indet. large pelecypod shell fragment
171'11" - 172' Lingula cf. subovalis Davidson
173'8" Indet. small shell fragments
191'6" Lingula cf. subovalis Davidson
203'11" - 204' Cycloid fish scale
204'4" - 204'4½" Lingula cf. subovalis Davidson

221'9" - 221'11" Tatella ? sp.

223'6" Indet. shell fragment

224' 9" - 224'11" "Modiolus" linguloides Hudleston

225'10" Indet. small pelecypod shell fragments

241'8" - 241'8½" Panopea maccoyi (Moore)

247'2" - 247'4" Tatella maranoana (Etheridge Jnr.)

257'2" - 257'2½" Nuculana randsi Etheridge Jnr.

Remarks:

The occurrence of the belemnite Peratobelus oxys together with the pelecypods Pseudavicula anomala, Tatella maranoana and Tatella ? sp. indicates an Aptian age for the sediments of this interval. All four species have been previously observed in outcrops of the Doncaster Member in the Richmond-Hughenden area.

Like the core from 147'6" - 280' in B.M.R. Richmond S.H. 1, the present core contains numerous speciments of the linquloid brachiopod Lingula cf. subovalis.

Pseudavicula anomala is represented between 165' 2" - 165' 4½" by several small typical specimens.

The single specimen of Tatella maranoana has slightly opened valves and is somewhat dorso-ventrally compressed.

That of Tatella ; sp. has a slightly rostrate anterior like the specimen figured by Etheridge Jnr. (1892, pl.28, figs. 2-5) from the Maranoa River near Mitchell (Doncaster Member).

The small left valve of Panopea maccoyi resembles those from 252'7" - 252'9½" and 277'7" - 277'8" in B.M.R. Richmond S.H.1.

Nuculana randsi is represented by a well preserved specimen with opened but unseparated valves.

The taxodont pelecypod identified as "Nucula" cf. "N". sp. 1 has closed valves and resembles elongately oval forms reported as Nucula sp. by Day (1964) from GAB1139 (Jones Valley Member), and GAB1137 and GAB1145 (Doncaster Member) in the Hughenden area.

Camptonectes sp. ind. is represented by a right valve with a large anterior ear. Unfortunately, the ornament is obscure and the specimen is not specifically determinate.

A few small specimens of "Modiolus" linguloides from 224'9" - 224'11" are probably conspecific with a specimen reported as Modiolus cf. eyrensis by Day (1963a) from GAB118 in the Doncaster Member of the Richmond area.

An incomplete left valve doubtfully identified as Maccoyella subangularis resembles a left valve reported from 154'7"-154'9" in B.M.R. Richmond S.H. 1. Maccoyella subangularis has not been observed in outcrops of the Doncaster Member in this area.

? Cyrenopsis sp. ind. is represented by a small right valve which has ornament like that of the genus Cyrenopsis.

Two small gastropods designated Acteon cf. hochstetteri closely resemble specimens previously reported from GAB870, 1017 (Day, 1963a) and GAB 1145 (Day, 1964) in the Doncaster Member of the Richmond-Hughenden area.

Peratobelus oxys is represented by a small, well preserved specimen with a long, tapered apical region.

B.M.R. LONGREACH S.H.1

Winton Formation

149' - 149' 3" Corbicula cf. burrumensis Etheridge Jnr.

Remarks:

The freshwater pelecypod Corbicula cf. burrumensis is represented by a specimen with opened but unseparated valves. The shape and ornament are quite like those features of Corbicula burrumensis Etheridge Jnr. (1892, pl.34, figs. 9-10) from the probable Albian Burrum Coal Measures, but the present specimen is considerably smaller.

B.M.R. LONGREACH S.H. 2.

Mackunda Formation

64'6" - 64'8"	Aucellina gryphaeoides ? (Sowerby)
	Camptonectes sp.
65'6" - 65'9"	Aucellina gryphaeoides (Sowerby)
	Nuculana sp. nov. A
	Large Inoceramus fragments
66'3" - 66'5"	Aucellina gryphaeoides (Sowerby)
71'9" - 71'10"	Aucellina gryphaeoides (Sowerby)
72'8" - 72'9"	Aucellina hughendenensis (Etheridge Jnr.)
76'3" - 76'4"	Aucellina sp. ind.
	Indet. Nuculana
85'11" - 86'	Aucellina hughendenensis (Etheridge Jnr.)

Allaru Mudstone

91'9" - 92'	Aucellina gryphaeoides (Sowerby)
	Nucula sp.
	Laevidentalium sp.
95'11½" - 96'	Aucellina gryphaeoides (Sowerby)
	Inoceramus fragments
	Carbonaceous plant fragments
101'2" - 101'3"	Aucellina gryphaeoides (Sowerby)
	Inoceramus fragments
101'11" - 102'	? Labeceras sp.
104'5" - 104'6"	? Labeceras sp.
	Aucellina sp. ind.
	Nuculana sp. nov. B.
	Inoceramus fragments
	Laevidentalium sp.
	Carbonaceous plant fragments
106'9" - 106'10"	Decapod crustacean claw
114'2" - 114'3½"	Camptonectes sp.
	Nucula sp.
	Carbonaceous plant fragments
115'4" - 115'6"	Nucula sp.
	Inoceramus fragments
	Carbonaceous plant fragments
118'11" - 119'	Nucula sp.
	Indet. pelecypod shell fragments
120'	Inoceramus fragments
	Indet. pelecypod shell fragments
120'6"	Inoceramus fragments
	Indet. pelecypod shell fragments
122'1" - 122'2"	Aucellina hughendenensis (Etheridge Jnr.)
125'8" - 125'9"	Aucellina gryphaeoides (Sowerby)
128'7" - 128'10"	Nuculana aff. randsi Etheridge Jnr.
	Aucellina sp. ind.
	Inoceramus fragments
131' - 131'2"	"Nucula" cf. quadrata Etheridge Jnr.
	Nuculana sp. nov. B.
	Inoceramus fragments
	Anchura aff. wilkinsoni Etheridge Jnr.
	Laevidentalium sp.

132'10"	Aucellina sp. ind.
133'6"	Large Inoceramus fragments
134' -134'3"	"Nucula" cf. quadrata Etheridge Jnr.
	Aucellina gryphaeoides (Sowerby)
	Inoceramus fragments
136'6"	Large Inoceramus fragments
138'9"	Large Inoceramus fragments
138'11" - 139'3"	Aucellina gryphaeoides (Sowerby)
	Nuculana sp. nov. A
	Nuculana sp. nov. B
	Laevidentalium sp.
139'10"	Large Inoceramus fragments
142' - 142'1"	Aucellina gryphaeoides (Sowerby)
	Small Inoceramus shells
145'11" - 146'	Aucellina gryphaeoides (Sowerby)
	Maccoyella sp. ind.
	Inoceramus fragments
	Laevidentalium sp.
145'6"	Large Inoceramus fragment
150'3"	Large Inoceramus fragment
153'	Large Inoceramus fragment
159' - 159'2"	Nuculana sp. nov. B
	Aucellina sp. ind.
	Carbonaceous plant fragments
162'2½" - 162'5"	Aucellina gryphaeoides (Sowerby)
	Inoceramus fragments
	Carbonaceous plant fragments

Remarks:

There is practically no difference in fauna between the interval 60' - 87' recorded as Mackunda Formation and that from 87'-164' recorded as Allaru Mudstone. A probable Upper Albian age for the sediments of this scout hole is indicated by the occurrence of the world-wide Upper Albian-Lower Cenomanian pelecypod species Aucellina gryphaeoides. Specimens referred to this species differ from those identified as Aucellina hughendenensis in lacking radial ornament. Those of A. hughendenensis from 72'8" - 72'9" and 85'11" - 86', if correctly placed in the Mackunda Formation, provide the first record of the species in that unit.

Inoceramus and Aucellina are as abundant in these cores as they are in surface localities reported by Day (1965). A notable feature is the profusion of carbonaceous plant fragments at numerous levels.

The only ammonites observed were two small heteromorph fragments from 101'11" - 102' and 104'5" - 104'6". They may belong to the genus Labeceras.

Gastropods are represented by six small, well preserved specimens of Anchura aff. wilkinsoni from 131' - 131'2". The species is common in outcrops of the Allaru Mudstone and the Mackunda Formation in this area.

The small, smooth scaphopod Laevidentalium sp. is represented at several horizons by a few specimens. It is also quite common in the Allaru Mudstone and the Mackunda Formation of the Longreach area.

Camptonectes sp. is represented in the interval 64'6" - 64'8" by a well preserved right valve. Specimens figured by Etheridge Jnr. (1892, pl.21, figs. 7,8,9) from Aramac and Rockwood Station are conspecific. Although only recorded from the Mackunda Formation here, the species is known elsewhere from the Allaru Mudstone and the Coreena Member.

The genus Maccoyella is represented from 145'11" - 146' by a large fragment showing concentrically interlocking shell structure.

These cores contain several Nuculacean species, all of which have previously been reported from the Allaru Mudstone and the Mackunda Formation. The commonest is a small, trigonal shaped form designated Nucula sp. Two specimens from 131' - 131'2" and 134' - 134'3", and identified as "Nucula" cf. quadrata are larger, and have a quadrate outline. Specimens of Nuculana sp. nov. A are posteriorly rostrate and bear prominent concentric ribs. The species has previously been reported from the top of the Allaru Mudstone in A.A.O. Penrith No. 1 (1,040' - 1,050') (Day, 1962) and from GAB652 and GAB653 in the Mackunda Formation of the McKinlay area (Day, 1963b) Nuculana aff. randsi is somewhat similar to N. sp. nov. A, but lacks prominent concentric ornament. Specimens of Nuculana sp. nov. B differ from both these forms in being posteriorly truncate.

B.M.R. LONGREACH S.H.3

Doncaster Member

116'	Inoceramus fragments
122'	Inoceramus fragments

Remarks:

The only organic remains found in the glauconitic mudstone interval 110'-147' referred to the Doncaster Member, were a few prismatic Inoceramus fragments. Inoceramus is particularly characteristic of Albian sediments in the Eromanga Basin, but also occasionally occurs in Aptian sediments. The sediments of this interval therefore could be Aptian or Albian in age. The range of the genus is Jurassic-Cretaceous.

Ronlow Beds

152' - 166'	Carbonaceous plant fragments
204'8" - 204'10½"	Mesohydridella cf. ipsviciensis (Etheridge Jnr.)
	Carbonaceous plant fragments

Remarks:

The freshwater pelecypod Mesohyridella cf. ipsviciensis is represented by a small right valve and the dorsal part of its opposing left valve. The form seems closer to Unio ipsviciensis Etheridge Jnr. (1892, pl.42, figs. 2-3) from the Middle Triassic Ipswich Coal Measures, than to Mesohyridella sp. nov. reported by Day(1963c) from GAB662 in the Winton Formation of the Mackunda area. On the palaeontological evidence available it is not possible to assign a precise age to this interval.

B.M.R. LONGREACH S.H. 4

Allaru Mudstone

53'9" - 54'	Aucellina hughendenensis (Etheridge Jnr.)
	Carbonaceous plant fragments
57'	Inoceramus fragments
69'	Indet. shell fragment
69'3" - 69'4"	Nucula sp.
	Aucellina sp. ind.
	Carbonaceous plant fragments
71'4"	Large Inoceramus fragment
72' - 72'5"	Inoceramus carsoni Mc Coy
	Pseudavicula sp. nov.
	Indet. gastropod ? Anchura
76'10"	Indet. small pelecypod
78'-78'3½"	Pseudavicula sp. nov.
79'5" - 79'6"	Inoceramus marathonensis ? Etheridge Jnr.
80'11" - 81'	Pseudavicula sp. nov.
81'5" - 81'6"	Pseudavicula sp. nov.
84'7"	Indet. gastropod ? Anchura
86'1" - 86'2½"	Pseudavicula sp. nov.
86'11" - 87'	Pseudavicula sp. nov.
89'3" - 89'5"	Pseudavicula sp. nov.
91'3" - 91'4"	Aucellina gryphaeoides (Sowerby)
	Pseudavicula sp. nov.
102'5" - 102'7"	Inoceramus sutherlandi Mc Coy
106'9" - 106'10"	Pseudavicula sp. nov.
108'6"	Decapod crustacean claw

109'1" - 109'3"	Pseudavicula sp. nov.
	Inoceramus fragments
109'9" - 109'10"	Aucellina gryphaeoides (Sowerby)
	Pseudavicula sp. nov.
110'6" - 110'8"	Inoceramus marathonensis Etheridge Jnr.
111'6"	Pseudavicula sp. nov.
	Inoceramus fragments
115'6"	Pseudavicula sp. nov.
	Inoceramus fragments
116'3" - 116'6"	Aucellina hughendenensis (Etheridge Jnr.)
118'3" -118'4"	Inoceramus marathonensis Etheridge Jnr.
	Pseudavicula sp. nov.
	Carbonaceous plant fragments
122'8" - 122'10"	Pseudavicula sp. nov.
	Inoceramus fragments
	Indet. pelecypod shell fragments
	Carbonaceous plant fragments
123'9" - 123'9½"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
124'3"	Aucellina hughendenensis (Etheridge Jnr.)
	Inoceramus fragments
125'10"	Inoceramus fragment
	Carbonaceous plant fragments
126'6" - 126'6½"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
129' - 129'1"	Aucellina hughendenensis (Etheridge Jnr.)
129'8" - 129'9"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
130'6"	Pseudavicula sp. nov.
132'6" - 132'9"	Pseudavicula sp. nov.
	Camptonectes sp.
	Carbonaceous plant fragments
136'4" - 136'6"	Inoceramus sutherlandi Mc Coy
136'8" - 136'10"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
137'6"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
138'	Inoceramus fragments
139'6"	Pseudavicula sp. nov.
139'9" - 139'10"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
	Carbonaceous plant fragments

140' - 141'	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
144'	Pseudavicula sp. nov.
	Carbonaceous plant fragments
144'6"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
145'6"-145'10"	Pseudavicula sp. nov.
	Inoceramus fragments
	Aucellina hughendenensis (Etheridge Jnr.)
	Carbonaceous plant fragments
146'8"-146'8½"	Aucellina hughendenensis (Etheridge Jnr.)
146'11½" - 147'	Pseudavicula sp. nov.
	Camptonectes sp.
	Carbonaceous plant fragments
148'5"-148'6"	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
149'	Inoceramus fragment
149'8" - 149'11"	Aucellina hughendenensis (Etheridge Jnr.)
	Inoceramus fragment
	Carbonaceous plant fragments
150'3"	Pseudavicula sp. nov.
150'11" - 151'	Pseudavicula sp. nov.
151'6" - 151'8"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
152'	Pseudavicula sp. nov.
153'2"	Pseudavicula sp. nov.
153'6"	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
154'1"-154'4"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments

154'7"	Pseudavicula sp. nov.
155'7"-155'9"	Aucellina hughendenensis (Etheridge Jnr.)
	Inoceramus sutherlandi ? Mc Coy
156'	Pseudavicula sp. nov.
	Carbonaceous plant fragments
157'2"-157'3"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
157'6"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
158'2"-158'6"	Aucellina hughendenensis (Etheridge Jnr.)
160'-160'3"	Inoceramus fragments
	? Panopea sp.
161'	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
162'4"	Aucellina hughendenensis (Etheridge Jnr.)
164'8"	Large Inoceramus fragment
166'9"	Aucellina hughendenensis (Etheridge Jnr.)
167'6"-167'7"	Pseudavicula sp. nov.
172'	Aucellina hughendenensis (Etheridge Jnr.)
173'4"	Aucellina hughendenensis (Etheridge Jnr.)
174'1"-174'4"	Pseudavicula sp. nov.
	Carbonaceous plant fragments
178'11"-179'	Pseudavicula sp. nov.
180'	Inoceramus fragments
181'10"-182'1"	Aucellina hughendenensis (Etheridge Jnr.)
184'8"	Pseudavicula sp. nov.
185'6" - 185'8"	Beudanticeras sp. ind.
	Aucellina hughendenensis (Etheridge Jnr.)
186'4"	Pseudavicula sp. nov.
186'7" - 186'9"	Pseudavicula sp. nov.
	Inoceramus fragments
194'	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
198'10"-199'	Pseudavicula sp. nov.
	Carbonaceous plant fragments

201'8" - 201'9"	Inoceramus sutherlandi McCoy
	Carbonaceous plant fragments
203'11"-204'	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
	Carbonaceous plant fragments
205'10"-206'	Pseudavicula sp. nov.
	Carbonaceous plant fragments
206'8"-206'9½"	Aucellina hughendenensis (Etheridge Jnr.)
	Indet. cyrenoid shell fragment
	Cycloid fish scale
	Carbonaceous plant fragments
209'8"-209'9½"	Falciferella ? sp.
210'	Aucellina hughendenensis (Etheridge Jnr.)
213'6"	Aucellina hughendenensis (Etheridge Jnr.)
214'-214'2½"	Aucellina hughendenensis (Etheridge Jnr.)
214'9"	Pseudavicula sp. nov.
	Inoceramus fragments
215'3"-215'3½"	Pseudavicula sp. nov.
216'10"	Pseudavicula sp. nov.
217'-217'1½"	Inoceramus marathonensis ? Etheridge Jnr.
	Carbonaceous plant fragments
219'	Aucellina hughendenensis (Etheridge Jnr.)
222'2½" - 222'4"	Tatella ? sp. ?
223'	Pseudavicula sp. nov.
223'9"	Pseudavicula sp. nov.
224'2"-224'3"	?Labeceras sp.
224'11"	Pseudavicula sp. nov.
225'9"	Aucellina hughendenensis (Etheridge Jnr.)
226'-226'3"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
226'9"-226'10"	Pseudavicula sp. nov.
	Inoceramus fragments
227'6"	Inoceramus fragments
228'	Large Inoceramus fragments
230'-230'1"	Pseudavicula sp. nov.
232'10"	Inoceramus fragments
233'4"	Inoceramus fragments

233'6"-233'7"	Falciferella ? sp.
	Pseudavicula sp. nov.
235'8"-235'10"	Pseudavicula sp. nov.
238'1"-238'1½"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
	Inoceramus fragments
	Carbonaceous plant fragments
238'8"	Aucellina hughendenensis (Etheridge Jnr.)
240'10"-241'	Aucellina hughendenensis (Etheridge Jnr.)
241'9"	Aucellina hughendenensis (Etheridge Jnr.)
244'7"-244'8"	Aucellina hughendenensis (Etheridge Jnr.)
245'8"-245'10"	Pseudavicula sp. nov.
	Inoceramus fragments
247'	Pseudavicula sp. nov.
249'8"-249'9"	Inoceramus carsoni McCoy
250'½"-250'2"	Pseudavicula sp. nov.
251'9"	Pseudavicula sp. nov.
253'-253'3"	Pseudavicula sp. nov.
261'3"-261'4"	Falciferella ? sp. ?
265'4"-265'5½"	Falciferella ? sp.
266'3"-266'½"	Pseudavicula sp. nov.
267'3"-267'5"	Falciferella ? sp.
	Inoceramus fragments
	Large indet. pelecypod
268'	Pseudavicula sp. nov.
268'4"-268'6"	Aucellina hughendenensis (Etheridge Jnr.)
	Pseudavicula sp. nov.
269'	Pseudavicula sp. nov.
271'-271'1"	Pseudavicula sp. nov.
272'2"-272'4"	Pseudavicula sp. nov.
272'10"-273'1"	Inoceramus carsoni McCoy
	Pseudavicula sp. nov.
274'	Pseudavicula sp. nov.
	Inoceramus fragments
274'6"-274'7½"	Aucellina hughendenensis (Etheridge Jnr.)
275'	Pseudavicula sp. nov.
	Inoceramus fragments

275'10½"-276'	Aucellina hughendenensis (Etheridge Jnr.)
	Inoceramus fragments
277'-277'1"	Pseudavicula sp. nov.
278'6"	Large Inoceramus fragments
279'	Large Inoceramus fragments
280'4½"-280'5"	Pseudavicula sp. nov.
284'6"	Pseudavicula sp. nov.
285'6"-285'7"	Pseudavicula sp. nov.
286'8"	Pseudavicula sp. nov.
290'6"	Inoceramus fragments
290'9"-290'9½"	Pseudavicula sp. nov.
292'7"-292'9½"	Inoceramus marathonensis Etheridge Jnr.
	Carbonaceous plant fragments.
293'1"-293'5"	Pseudavicula sp. nov.

Remarks:

Like sediments of the Allaru Mudstone in B.M.R. Longreach S.H. 2 there is an abundance of Aucellina and Inoceramus together with carbonaceous plant fragments in these cores. The fauna is a typically Albian one. The pelecypod genus Aucellina is represented by two species, A. hughendenensis and A. gryphaeoides. The former is more abundant than the later.

The genus Inoceramus is represented by three species. Specimens identified as I. carsoni are small to medium in size and mytiloid in shape. Those of I. sutherlandi are approximately the same size but are quadrate in shape. Specimens of I. marathonensis are larger and incomplete, but show the widely spaced, plicate concentric ribs characteristic of this species.

There is a remarkable concentration of the pelecypod Pseudavicula sp. nov. in these cores. Its valves bear numerous radial, rather flat-topped ribs, which are unlike those of any previously described species of Pseudavicula. The species has previously been observed in the Toolebuc Limestone of the Richmond and Hughenden areas, and in the Allaru Mudstone in the Muttaburra and Longreach area.

Specimens of Camptonectes sp. from 132'6" - 132'9" and 146'8" - 146'8½" are conspecific with those from B.M.R. Longreach S.H. 2.

The small right valve of Nucula sp. from 69'3" - 69'4" is also very similar to those from B.M.R. Longreach S.H. 2.

A form designated Tatella ? sp. ? is represented by a small right valve, which in shape resembles the Aptian species Tatella ? sp. However, the two may not be conspecific.

Several ammonites were found in these cores. The best preserved are those identified as Falciferella ? sp. A less well preserved specimen was reported by Day (1962) from the interval 1,600' - 1,610' in A.A.O. Penrith No. 1, Falciferella - like forms have occasionally been observed in the topmost sediments of the Ranmoor Member, and in the Toolebuc Limestone and Allaru Mudstone.

The last whorl of the sole, medium - sized specimen of Beudanticeras sp. ind. from 185'6"-185'8" is incomplete, and the form cannot be identified specifically.

A small heteromorph fragment from 224'2" - 224'3" may be referable to the genus Labeceras. Similar heteromorph fragments were found in B.M.R. Longreach S.H. 2 and from 1,600 - 1,610 in A.A.O. Penrith No. 1.

B.M.R. LONGREACH S.H. 5

Toolebuc Limestone

95' - 99'	Aucellina hughendenensis (Etheridge Jnr.)
	Inoceramus fragments

Remarks:

The whole interval 95' - 99' referred to the Toolebuc Limestone is crammed with large Inoceramus shell fragments and bands rick in separated valves of Aucellina hughendenensis. Outcrops in this area are similar palaeontologically (Day, 1965). The fauna indicates an Albian age for these sediments.

Coreena Member

104'6" - 104'8"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
	Laevidentalium sp.
	Carbonaceous plant fragments
108'2"	Barcoona trigonalis (Moore)
111'10½" - 112'	Barcoona trigonalis (Moore)
	Nuculana sp. nov. A
	Carbonaceous plant fragments
112'2" - 112'3"	Barcoona trigonalis
	Carbonaceous plant fragments
118'9"	Barcoona trigonalis (Moore)

119'7" - 119'8"	Aucellina hughendenensis (Etheridge Jnr.)
120'9" - 120'10"	Barcoona trigonalis (Moore)
	Carbonaceous plant fragments
121'11" - 122'2"	Aucellina hughendenensis (Etheridge Jnr.)
	Camptonectes sp.
122'5" - 122'8"	Aucellina hughendenensis (Etheridge Jnr.)
	Camptonectes sp.
	Indet. irregular echinoid
	Carbonaceous plant fragments
129' - 129'1"	Camptonectes sp.
	Carbonaceous plant fragments
129'8" - 129'9"	Aucellina hughendenensis (Etheridge Jnr.)
131'7" - 132'	Barcoona trigonalis (Moore)
	Maccoyella rockwoodensis (Etheridge Jnr.)
	Camptonectes sp.
	Nuculana sp. ind.
	Anchura sp. ind.
132'2" - 132'4"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
	Camptonectes sp.
132'7" - 132'8½"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
133'3" - 133'6"	Barcoona trigonalis (Moore)
	Camptonectes sp.
	Anchura sp. ind.
134'10"-134'11"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
136' - 136'2½"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
	Carbonaceous plant fragments
136'9" - 136'10½"	Barcoona trigonalis (Moore)
138'4" - 138'5"	Barcoona trigonalis (Moore)
	Camptonectes sp.
	Carbonaceous plant fragments
140'8"-140'9"	Barcoona trigonalis (Moore)
	Camptonectes sp.
142'10"	Aucellina hughendenensis (Etheridge Jnr.)
146'11"-147'1"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)

	Camptonectes sp.
	Indet. irregular echinoid fragment
	Carbonaceous plant fragments
147'5½"-147'7"	Aucellina hughendenensis (Etheridge Jnr.)
	Barcoona trigonalis (Moore)
	Inceramus fragments
	Anchura sp. ind.
	Carbonaceous plant fragments.

Remarks:

The sediments from 99' - 145' referred to the Coreena Member in this scout hole contain an abundance of the pelecypods Aucellina hughendenensis and Barcoona trigonalis, together with carbonaceous plant fragments. The fauna corresponds closely with that reported from outcrops of the Coreena Member of the Longreach area by Day (1965) and indicates an Albian age.

Specimens of Camptonectes sp. are conspecific with those reported from B.M.R. Longreach S.H.2 & 4. A small right valve of Maccoyella rockwoodensis from 131'7" - 132' shows the sparse radial ribs typical of this species. M. rockwoodensis is common in the Mackunda Formation and the Allaru Mudstone, but has not been reported previously from the Coreena Member. Maccoyella specimens reported by Day (1965) from outcrops of the Coreena Member in this area were not determinate specifically.

The left valve of Nuculana sp. nov. A is well preserved and does not seem to differ from specimens from the Mackunda Formation and the Allaru Mudstone in B.M.R. Longreach S.H. 2. The present specimen provides the first record of the species from the Coreena Member.

The occurrence of irregular echinoids is of interest as the only previous echinoids observed in collections from the marine Cretaceous of the Eromanga Basin are in the Ranmoor Member of the Hughenden area (GAB1143).

REFERENCES:

DAY, R.W., (1962): Palaeontological report on core samples from the A.A.O. Penrith No. 1 well. Unpub. Geol. Surv. Q'ld. rep.

- (1963a): Lower Cretaceous (Aptian) fossils collected from the Doncaster Member of the Richmond 1:250,000 sheet area by the B.M.R.-G.S.Q. Great Artesian Basin party in 1962. Unpub. Geol. Surv. Q'ld. rep.

- (1963b): Report on Lower Cretaceous fossils collected from the Mackunda Beds of the McKinlay 4-mile sheet area by the B.M.R. Great Artesian Basin party in 1961. Unpub. Geol. Surv. Q'ld. rep.

- (1963c): Report on fossils collected from the Mackunda 4-mile sheet area by the B.M.R. Great Artesian Basin party in 1961. Unpub. Geol. Surv. Q'ld. rep.

- (1964): Palaeontological reports. Appendix D in: VINE, R.R., CASEY, D.J., and JOHNSON, N.E.A., Progress report, 1963 on the geology of the north-eastern Eromanga Basin, Queensland. Bur. Min. Resour. Aust. Rec. 1964/39 (unpubl.).

- (1965): Appendix I in VINE, R.R., JAUNCEY, W.J., CASEY, D.J., and GALLOWAY, M.C., Geology of the Longreach-Jericho-Lake Buchanan area, Queensland. Bur. Min. Resour. Aust. Rec. 1965/245(unpubl.)

ETHERIDGE, R.Jnr., 1892: In JACK, R.L., and ETHERIDGE, R. Jnr. The geology and palaeontology of Queensland and New Guinea. Geol. Surv. Q'ld. Publ., 92, (1,2).