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MICROPALAEONTOLOGY OF FURTHER ROCK SAMPLES FROM THE GREAT ARTESIAN BASIN, QUEENSLAND.

by

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SUMMARY

The foraminiferal assemblages found in the samples from the Great Artesian Basin are Lower Cretaceous in age. Arenaceous genera dominate the assemblages in both surface and subsurface sediments. Calcareous tests are represented chiefly by the planktonic genus Globigerina which is characteristic of the Toolebuc Member of the upper Wilgunya Formation. The foraminiferal assemblage in this formation is regarded as equivalent of the upper Albian. The arenaceous assemblage which is prominent in the lower Wilgunya Formation is regarded as Lower Albian. A suite of arenaceous tests of unique composition was found in samples from the Dribbling Bore, Sandringham, and on evidence of associated macrofossils is referred to the Aptian Stage and probably equivalent of the Roma Beds.

INTRODUCTION

Approximately 100 samples collected by the Great Artesian Basin Geological party during 1960, were submitted for micro-palaeontological examination. They came from localities included in the 4-Sheets of Mt. Whelan, Bedourie, Machattie, Mackunda, Blackall, Glenormiston, Springvale, Hay River, Simpson Desert North, Birdsville, Canterbury and Poolawanna (South Australia).

Thirty two samples were unfossiliferous. As in the previous collection reported upon in Records 1960/26, arenaceous tests dominated the assemblages of foraminifera of Lower Cretaceous age in surface samples whilst excellently preserved ones were found in some of the subsurface sediments. The small planktonci genus Globigerina was typical of the rocks of the Toolebuc Member of the upper Wilgunya Formation. Radiolaria-bearing rocks were not common. The most striking assemblage of arenaceous foraminifera was found in samples from Dribbling Bore, Sandringham Station, large but worn fragments of ilmenite and crystals of zircon were included with quartz grains in the fine siliceous cement.

DETAILED DESCRIPTION OF SAMPLES

Mt. Whelan 4-Mile Sheet

GAB.19. Low hills 9 miles W. of 8 mile Yard on Herbert Downs, S. of track to Charlie's waterhole. Mt. Whelan Run 3/5081

Ochreous sandy siltstone with gypsum and small arenaceous foraminifera.

Foraminifera: Ammobaculites fisheri
Haplophragmoides sp.
Involutina cretacea
Trochammina minuta

GAB. 23. Dry Bore Creek, Tank, Marion Downs. Mt. Whelan Run 9/5015

Ochreous and grey siltstone with gypsum, abundant glauconite and well preserved arenaceous foraminifera.

Foraminifera: Ammobaculites fisheri
Ammobaculites subcretacous (c)
Ammobaculites sp. nov. 1
Ammobaculites sp. nov. 2 (c)
Ammobaculites minimus
Dorothia cf. filiformis
Flabellammina alexanderi
Haplophragmoides chapmani
Haplophragmoides sp. nov. 1
Haplophragmoides sp. nov. 2
Involutina cretacea
Proteonina sp. nov.
Recphax deckeri (c)
Spiroplectammina ammovitrea
Spiroplectammina cushmani
Verneuilina howchini

GAB. 26. N. end of mesa, 1½ miles WSW of Montara Waterhole, Sandringham. Mt. Whelan Run 15/5069

Calcareous rock. No microfossils.

GAB. 27. Mirrica Bore, Sandringham

80-85 feet. Sandy claystone. No microfossils

160-170 feet. Claystone with a few rounded bodies, ?radiolaria.

176-192 feet. Claystone with glauconite and opaline material. No microfossils.

GAB. 30. Mt. Coley Tank, Marion Downs. Mt. Whelan Run 5/5031

Siltstone with gypsum and glauconite. No microfossils.

GAB. 45. Hills N. of track to Parapituari Waterhole from 8-mile Yard, Herbert Downs, about 5 miles from Yard. Mt. Whelan Run 1/5005.

Sandstone with hematitic material. No microfossils.

GAB. 46. Low rise 1½ miles ENE of GAB. 45. Mt. Whelan Run 1/5005

Purplish cherty rocks and ochreous sandstone. No microfossils.

GAB. 47. Low rise ¼ mile N. of track to Charlie's Waterhole from 8-mile Yard, Herbert Downs, 6 miles W. of Yard. Mt. Whelan Run 3/5083.

Radiolarian siltstone with numerous radiolaria, some tests distorted and compressed (Cenosphaera sp.).

GAB. 48. 3 miles S.E. of Old Herbert Downs Station Yard. Mt. Whelan Run 3/5081

Siltstone with arenaceous foraminifera.

Foraminifera:
Ammobaculites fisheri
Ammobaculites subcretaceus
Bathysiphon sp.
Haplophragmoides dickinsoni
Haplophragmoides sp.
Involutina cretacea
Spiroplectammina sp.

GAB. 50. Hills E. of arkose outcrop 6½ miles NNE of Mt. Coley Tank on Marion Downs. Mt. Whelan Run 4/5109.

Radiolarian siltstone with numerous tests of radiolaria chiefly Cenosphaera sp.

GAB. 53. 7 miles ENE of Mt. Whelan. Mt. Whelan Run 6/5063

Calcareous sandstone with subangular to rounded quartz grains and some glauconite. No recognizable microfossils.

GAB. 55. 8 miles E. of Mt. Whelan. Mt. Whelan Run 7/5121

Calcareous sandstone with subangular to rounded quartz grains and some green and brown glauconite. A few indeterminate fossil remains, cf. fish fragments.

GAB. 57. 1½ miles N. of track to Marion Downs Homestead from Hilary Dam, 5½ miles ENE from Dam. Mt. Whelan Run 8/5139.

Pinkish to cream siltstone. No microfossils.

GAB. 62. Scarp 2 miles NNW of Marion Downs just S. of Herbert Downs road. Mt. Whelan Run 6/5047.

Calcareous siltstone with shell fragments, Inoceramus prisms, and few poorly preserved minute tests of Globigerina and fish fragments.

GAB. 63. Hills at head of gully 11 miles W. of Marion Homestead. Mt. Whelan Run 6/5051.

Calcareous siltstone with abundant fish remains.

GAB. 66a. About 4 miles NE. of northernmost of the Three Sisters (Breadalbane). Mt. Whelan Run 13/5101

Limonitic rock with gypsum, fine quartz grains and small arenaceous foraminifera (Trochammina sp., cf. Trochamminoides coronus).

GAB. 68. Sample from bore drain of Breadalbane No. 6 Bore. Mt. Whelan Run 13/5101

Ochreous sandstone with a little glauconite and rare arenaceous foraminifera (Haplophragmoides cf. chapmani).

GAB. 92. Small hill about 1 mile N. of Dry Bore Creek, W. side of main scarp, and 6 miles ENE of Dry Bore Creek Tank. Mt. Whelan Run 9/5013.

Hematitic pisolitic rock with arenaceous foraminifera.

Foraminifera:
- Ammobaculites fisheri
- Ammobaculites subcretaceus
- Ammobaculites cf. goodlandensis
- Ammobaculites minimus
- Haplophragmoides globosa
- Haplophragmoides sp. nov.
- Reophax deckeri
- Spiroplectammina ammovitrea
- Trochammina minuta

GAB. 213. Whitewood Tank, 30 miles SW. of Marion Downs Homestead on track to Sugarloaf Hill.

Ochreous gypseous siltstone, with a few radiolaria (Cenosphaera sp.) and a few arenaceous foraminifera (Haplophragmoides sp. nov., Ammobaculites minimus, and indeterminate forms).

GAB. 216. 18-mile Tank on Breadalbane, 12 miles W. of Breadalbane Homestead on track to No. 5 bore.

Siltstone with a few arenaceous foraminifera (Haplophragmoides sp. nov., cf. GAB. 213).

GAB. 218. Breadalbane No. 3 Bore, 20 miles W. of Breadalbane Homestead. (sample from old sludge heap)

Sandy siltstone with carbonaceous fragments, a little glauconite, a few radiolaria, numerous arenaceous foraminifera and a few Inoceramus prisms.

Radiolaria:
- Cenosphaera sp.
- Dictyomitra sp.

Foraminifera:
- Ammobaculites minimus
- Ammobaculites subcretaceus
- Haplophragmoides chapmani
- Haplophragmoides dickinsoni
- Haplophragmoides sp.
- Involutina sp.
- Reophax sp.
- Spiroplectammina sp. nov.
- Spiroplectammina ammovitrea
- Trochammina raggatti
- Trochammina sp. nov.
- Verneuilina sp. nov.

GAB. 302. 16 miles S. of Polly's Lookout on Marion Downs, Mt. Whelan Run 6/5064.

Ochreous silty limestone with glauconite and cidaroid plates and spines.

Montara Bore, Sandringham

333-355 feet. Pyritic sandstone with fragments of green rock and foraminifera rare (Haplophragmoides cf. chapmani, H. sp.).

390 feet. Mixed rock types. No fossils.

564 feet. Sandstone. No fossils.

610 feet. Sandstone and grey siltstone with glauconite.

613-621 feet. Sandstone and a little grey siltstone.

654-718 feet. Sandstone.

Peelunga Bore, Glenormiston.

1. Head of bore. Fine sandstone with a few arenaceous foraminifera (Haplophragmoides dickinsoni, Reophax deckeri).

2. 2 feet from bore head. Gypsum, abundant glauconite and arenaceous foraminifera.

Foraminifera: Ammobaculites subcretaceus
Haplophragmoides cf. dickinsoni
Haplophragmoides sp.
Reophax deckeri

3. 2-3 feet from end. Sandstone with arenaceous foraminifera.

Foraminifera: Ammobaculites subcretaceus
Haplophragmoides sp.
Involutina cretacea
?Reophax deckeri

4. End of drain. Sandstone with pyrite. No foraminifera.

W.32. Small section of gypsiferous clay, 3 miles S. of Carlo Springs, Glenormiston Station.

Siltstone with glauconite and poorly preserved arenaceous foraminifera.

Foraminifera: Ammobaculites fisheri
Haplophragmoides spp.
Involutina sp.
cf. Siphotextularia
Trochammina minuta

Ochreous siltstone with gypsum. No microfossils.

W. 262. 9 miles W. of Hilary Dam at head of Dry Bore Creek, just N. of track. Mt. Whelan Run 9/5013.

Hematitic material, ?calcite needles, gypsum. No microfossils.

Dribbling Bore, Sandringham

470-489 feet. Quartz grains, pyrite, glauconite, mica flakes and numerous arenaceous foraminifera. Many of the tests contained large worn fragments of ilmenite, crystals of pink zircon and worn fragments of yellow zircon and other minerals in a siliceous cement.

Foraminifera:
- Ammobaculites australe
- Ammobaculites irregulariformis
- Ammobaculites subcretacea
- Ammobaculoides romaensis
- Bigenerina loeblichi
- Haplophragmoides sp. nov. 1
- Haplophragmoides sp. nov. 2
- Psammosphaera sp. nov.
- cf. Siphotextularia
- Spiroplectammona cushmani
- Spiroplectammina aff. longa
- Reophax sp. nov.
- Textularia sp. nov.
- Trochammina minuta
- Trochammina raggatti

Bedourie 4-Mile Sheet

GAB.25. Sample from drain of Dud Bore, 1 mile N. of Kartarchara Bore, Sandringham, Bedourie Run 2/5065

Yellowish glauconitic sandstone with the fine washings composed almost entirely of glauconite grains and well preserved arenaceous foraminifera.

Foraminifera:
- Ammobaculites subcretaceus
- Haplophragmoides chapmani
- Haplophragmoides dickinsoni
- Haplophragmoides sp. nov.
- Spiroplectammina edgelli
- Spiroplectammina ammovitrea
- Trochammina minuta
- Verneuilina howchini

GAB. 31. 2 miles E. of 8-mile Waterhole, Sandringham. Bedourie Run 3/5013.

Calcarenite with minute Globigerina, cidaroid spines, abundant Inoceramus prisms and fish remains.

GAB. 34. Section in north bank of creek, S. of Sandringham road, 3 miles from homestead. Bedourie Run 3/5013.

a. Top 5 feet. Sandy siltstone with gypsum, a few arenaceous foraminifera (Haplophragmoides sp.), indeterminate radiolaria, Inoceramus prisms and numerous fish remains.

b. Middle 1 foot. Calcareous rock. No microfossils, but macrofossils (Ammonites, Inoceramus, Aucellina).

a. Basal 6 feet. Siltstone with gypsum, poorly preserved arenaceous foraminifera (Haplophragmoides sp.), Inoceramus prisms and fish remains.

GAB.35. 5 miles S. of Sandringham along road to Wickamunna Bore. Bedourie Run 3/5015.

Sandstone with glauconite grains, glauconitic infillings of foraminifera and ostracoda, and fish remains.

GAB.37. 6 miles from Canuto Waterhole, Sandringham, near road to Wickamunna Bore, Bedourie Run 5/5069

Siltstone with indeterminate radiolaria and foraminifera and fish teeth.

GAB. 38. N. edge of Lake Wickamunna, 6 miles ESE of Wickamunna Bore. Bedourie Run 5/5069

Glauconitic siltstone with radiolaria often ironstained and minute foraminifera.

Radiolaria: Astrophacus sp.
cf. Stylosphaera
Stylodictya sp.

Foraminifera: Globigerina sp.

GAB.39. E. edge of Lake Wickamunna, 3 miles SW. of Mug Creek Yard on Kamaran Downs. Bedourie Run 6/5097

Siltstone with foraminifera rare (Haplophragmoides sp.), radiolaria (Cenosphaera sp.) and Inoceramus prisms.

GAB.40. Sandstone Boulder on surface near S. end of Sand dune 6 miles S. of GAB.39. Bedourie Run 7/5097

Hematite siltstone. No microfossils.

GAB.42a $1\frac{3}{4}$ miles S. of southern edge of Lake Wickamunna, Kamaran Downs. Bedourie Run 6/5097.

Sandstone. No microfossils.

GAB.42b. $\frac{3}{4}$ miles S. of southern ridge of Lake Wickamunna. Bedourie Run 6/5097.

Siltstone. No microfossils.

GAB.70. About 8 miles SSW of Mug Creek Yard on Kamaran Downs. Bedourie Run 7/5155.

a. Brown siltstone with glauconite.

b. Siltstone with dendritic ? ironstaining.

GAB.71. 6 miles S. of GAB.70. Bedourie Run 8/5113

Siltstone. No microfossils.

GAB.73. From seismic hole (No. 100) about 1 mile E. of Kamaran Downs Bore No. 3. Bedourie Run 7/5153

Sandstone with gypsum. No microfossils.

GAB.75. Edge of track to Muncoonie from Glengyle, about 6 miles W. of yard below Wilpaterry Waterhole. Bedourie Run 14/5145.

Whitish siltstone with a little quartz. No fossils.

GAB.77. Walls of Crowsnest Tank, Glengyle Station.

Quartz sand with angular to subangular grains and gypsum. No microfossils.

GAB.78. Low Hills about 2 miles SSE. along sand dune from Pippagitta Bore, Glengyle. Bedourie Run 9/5037.

Fine siltstone. No microfossils.

GAB.85. About 2 miles W. of Sandringham Station on E. side of dune ($\frac{3}{4}$ mile S. of Montara Waterhole track). Bedourie Run 2/5069.

Ochreous siltstone with Inoceramus prisms and abundant fish remains.

Birtabinta Tank, Glengyle.

White to ochreous sandy siltstone. No microfossils.

No. 90 Hole, Kamaran Downs.

White siltstone. No fossils.

Blackall 4-mile Sheet

GAB.5a $4\frac{1}{2}$ miles W. of Blackall on Isisford road.

Fossil wood.

Mackunda 4-mile Sheet

GAB.8c. 3 miles E. of Middleton.

Ochreous sandstone. No microfossils.

GAB.11. Road cutting in hills 32 miles W. of Middleton on road to Lucknow. Sample just below silicified cap.

Whitish siltstone. No microfossils.

Springvale 4-Mile Sheet

GAB.59. From seismic shot hole, 3½ miles N. of Calendula Creek (50/20) on Bedourie-Boulia road.

Fine sandstone with gypsum and Inoceramus prisms.

GAB.205 At foot of hills 100 yards W. of Hilary Tank, 66 miles N. of Bedourie

Fine siltstone with fine arenaceous foraminifera, chiefly crushed tests and calcareous forms rare.

Foraminifera: Haplophragmoides sp. nov.
Trochamminoides coronus
Verneuilinoides sp.
Guembelina sp.
Indeterminate rotaline.

GAB.236. Bellvue Stock-route, 29 miles S. of Marion Downs on Boulia-Bedourie road, a few hundred yards W. of tank.

Whitish siltstone. No microfossils.

GAB.304a-d. 12 mile Tank, Marion Downs
Samples in descending order from top of section.

304 Surface. Ochreous limestone with poorly preserved Globigerina, Inoceramus prisms and fish remains.

304d. 9-12 feet above base. Gypsum and glauconite, with glauconitic casts of Globigerina, and fish remains.

304c. 7-9 feet above base. Chiefly gypsum with radiolaria rare (Cenosphaera), abundant small Globigerinae (Globigerina infracretacea, G. planispira), Inoceramus prisms and fish remains.

304b. 4-7 feet above base. Siltstone with abundant gypsum, radiolaria (Cenosphaera sp.), foraminifera rare (Globigerina planispira, Involutina sp.), Inoceramus prisms, and fish teeth.

304a. 0-4 feet above base.

1. Ochreous siltstone with poorly preserved arenaceous foraminifera and fish remains.

Foraminifera: Haplophragmoides sp. nov.
Involutina sp.
Trochammina sp. (delicate form)
Trochamminoides coronus

2. Ochreous siltstone with glauconite, numerous arenaceous foraminifera and a few fish remains.

Foraminifera: Ammobaculites cf. goodlandensis
Ammobaculites subcretaceus
Ammobaculites sp. nov.
Flabellammina alexanderi
Haplophragmoides chapmani
Haplophragmoides dickinsoni
Haplophragmoides sp. nov.
Hyperammina sp.
Involutina cretacea

Psammosphaera sp. nov.
Reophax deckeri
Reophax sp.
Spiroplectammina ammovitrea
Spiroplectammina sp. nov.
cf. Trochamminoides coronus
Trochammina sp. nov.
Trochammina sp.
Verneuilina howchini

Glenormiston 4-Mile Sheet

GAB.58. Cottonbush Well, Herbert Downs

a. 93-118 feet. Silty sandstone. No fossils
b. 130-183 feet. Silty sandstone. No fossils

Machattie 4-Mile Sheet

GAB.60 Seismic Shot Hole, ½ mile S. of Sandringham boundary (50/20) on Bedourie-Boulia road.

Limonitic rock with quartz grains and rounded bodies ?radiolaria.

GAB.80 Along the Coorbulka-Davenport Downs boundary fence, about 6 miles N. of Coorabulka-Monkina corner and about 1½ miles E. of gate in fence.

Fine sandy siltstone with glauconite grains, glauconitic replacement of radiolaria and Inoceramus prisms.

GAB.228 2½ miles E. of Ingledoon No. 1 Bore.

Crystalline rock with ironstaining and a little glauconite.

GAB.229. 4 miles E. of Ingledoon No. 1 Bore.

Silty sandstone with glauconite, indeterminate foraminifera, Inoceramus prisms and fish remains.

GAB.230. Tank, 9 miles E. of Ingledoon No. 1 Bore

Siltstone with gypsum and some ironstained material. No microfossils.

GAB.232. 1 mile W. of Davenport Downs road, 25 miles from Ingledoon No. 1 Bore.

Silty sandstone with angular quartz grains, glauconite, and glauconitic replacement of foraminifera and ostracoda.

GAB.233. 2½ miles W. of GAB.232

Calcareous sandstone. No microfossils.

GAB.246. 6 miles SE. of Ingledoon No. 2 Bore.

Silty sandstone with glauconite, glauconitic infillings of foraminifera and Inoceramus prisms, rare.

Hay River 4-Mile Sheet

Loc. D 6 (Gravity Survey). Hay River Run 11.5091. Flood out of Plenty River.

Ochreous siltstone with ? opaline fragments. No fossils.

Simpson Desert North 4-Mile Sheet

Loc. A (Gravity Survey). Simpson Desert N. Run 5/5011.

Siltstone with patches of angular quartz grains and a few glauconite grains. No microfossils.

Birdsville 4-Mile Sheet

GAB.238. In Georgina River, 5 miles N. of old Annandale Ruins

Siltstone with a little glauconite, and minute radiolaria.

Canterbury 4-Mile Sheet

GAB.249 20 miles W. of Canterbury along Mooraberrie-Mindorah Road.

Silty sandstone with glauconite and glauconitic replacement of foraminifera and ostracoda.

Poolawanna, S. Australia, 4-Mile Sheet

GAB.93. 90 miles W. of Birdsville in the Simpson Desert.

? Freshwater limestone with numerous tube-like fragments.

GAB.94. 116 miles W. of Birdsville in the Simpson Desert.

Gypsum.

Notes on the Microfossil Assemblages

The features of the microfauna found in the samples described above are:

1. The presence of small tests of the planktonic foraminiferal genus Globigerina, in samples in the Toolebuc Member where it is associated with Inoceramus prisms.

2. The abundance of small fragments of fish remains.

3. The rich assemblage of well-preserved arenaceous foraminifera in the lower Wilgunya and upper Longsight Sandstone.

4. The absence of calcareous foraminiferal species in all samples except GAB.205, from the lower Wilgunya Formation in which arenaceous foraminifera are common.

5. Radiolaria abundant in one sample, GAB.47.

The following stratigraphic units are recognized by the field geologists in the area under discussion:

Winton Formation

Upper Wilgunya Formation

Toolebuc Member of Upper Wilgunya Formation

Lower Wilgunya Formation

Longsight Sandstone (upper portion fossiliferous).

Sample of special interest were GAB.304a-d, from a sectiom at 12 mile Tank, Marion Downs, which clearly illustrated the marked change in the microfaunal assemblage of the lower Wilgunya and the Toolebuc Member of the upper Wilgunya.

Upper Wilgunya Formation

The following fossiliferous samples are included in this unit: GAB. 34, 39, 59, 80, 205, 216, 228, 229, 232, 246. The position of GAB.66a is uncertain but may belong to the basal part of upper Wilgunya Formation in about the same position as GAB.205 which is from immediately above the Toolebuc Member.

The lithology of the rocks included in this unit is sandstone and silty sandstone, with glauconite. Fossils found in these beds are a few radiolaria and arenaceous foraminifera, Inoceramus prisms and fish remains. The arenaceous foraminifera are represented by a new species of Haplophragmoides and Ammobaculites minimus Crespin. Samples GAB.66a and 205, which probably come within the uppermost portion of the Wilgunya Formation, contain an interesting assemblage of small, fine-grained arenaceous foraminifera, Haplophragmoides sp. nov., and Trochamminoides coronus Loeblich and Tappan, with one specimen of the planktonic genus Guemblina in GAB.205. The genus Guemblina has not been recorded below the Cenomanian at the base of the Upper Cretaceous, but evidence from macrofossils in the area indicate that the age of the rocks is Upper Albian (topmost Lower Cretaceous).

Toolebuc Member

The following samples are included in this unit: GAB.31, 62, 63, 85, 304, 304b, c, d. GAB. 35, 37 and 38 are tentatively placed here. Eight feet of Toolebuc sediments are exposed at 12 miles Tank Marion Downs (GAB.304, 304b, c, d). The siltstones contain glauconite, gypsum, numerous Globigerinae (G. planispira Tappan, G. infracretacea Glaessner), Inoceramus prisms and fish remains. This assemblage is characteristic of the Toolebuc Member.

The species G. infracretacea was described from the Albian and is generally regarded as typical of that stage. It ranges from the uppermost Neocomian (basal Lower Cretaceous) and has been found rarely in the Cenomanian (basal Upper Cretaceous). Bolli (1959) in his work on the planktonic foraminiffera from the Cretaceous of Trinidad, gives the range of G. infracretacea in that region as from the upper Neocomian (Barremian) to the upper Albian. The Albian age of the present occurrence is confirmed by its association with macrofossils of that age.

Lower Wilgunya Formation

The samples included in the lower Wilgunya Formation are GAB.19, 23, 25, 47, 48, 50, 68, 92, 213, 304a, Montara Bore (333-355 feet), Peelunga Bore, W.32. Sample GAB.218 is probably a composite sample including fragments from both the lower and upper Wilgunya Formation.

The microfauna of the lower Wilgunya is characterised by a rich assemblage of arenaceous foraminifera, which was discussed by the writer in her report on the 1959 collection from the Great Artesian Basin (Records 1960/25). In the 1960 collection, arenaceous foraminifera were found not only in the sandstones and silty sandstones but in other lithologies such as in a hematitic pisolitic rock (GAB.92). Evidence of the macrofossils indicates that the lower Wilgunya is the equivalent of the Lower Albian.

Sample GAB.47 contained abundant radiolaria, constituting a radiolarian siltstone.

Upper Longsight Sandstone

This unit is represented by the following samples: GAB.53, 55 and Dribbling Bore, Sandringham from 470 to 489 feet. The samples are represented by subangular to rounded quartz grains which are consolidated in GAB.53 and 55. Glauconite is also present.

The material from the Dribbling Bore at 470-489 feet consists of quartz grains, subangular to rounded, pyrite, glauconite, and numerous large arenaceous foraminifera the tests of which are composed of quartz grains, crystals of zircon and large rounded particles of black ilmenite. W.B. Roberts who kindly studied these tests also reported the presence of traces of arsenic, lead, copper and strontium in the composition of the tests. The assemblage contains species found at Roma (Ammobaculoides romaensis, Spiroplectammina cushmani, the test of which also comprised fragments of a black mineral). New species of Haplophragmoides, Psammosphaera, Roephax, Trochammina and Textularia were present. The macrofossils in this area indicate an Aptian age for the beds, which gives a close correlation with the Roma deposits.

The palaeocology suggested by the microfossil assemblages is that the Upper Wilgunya with its small arenaceous foraminiferal tests together with Inoceramus prisms were possibly deposited not far off-shore. But the association of the planktonic genus Globigerina with numerous prism of the pelagic Inoceramus in the Toolebuc Member indicates off-shore deposition in clear water.

The rich assemblage of arenaceous foraminifera, with the absence of Inoceramus prisms in the Lower Wilgunya and in the upper Longsight Sandstone, suggest near-shore conditions during sedimentation in a brackish water environment.

Considerable water action seems to have been present sometime during the deposition of the upper Longsight Sandstone because of the subangular to rounded shape of the component quartz grains, both in the sandstone itself and in that comprising the foraminiferal tests.

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