Rept. Bk. No. 61/113
G.S. No. 3291
Pal. Rept. No. 13/65

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

PALAEONTOLOGY SECTION

KINGSTON-ON-MURRAY BRIDGE SITE, BORE NO. 5

STRATIGRAPHY AND MICROPALAEONTOLOGY

- Highways & Local Government Department -

by

J. M. Lindsay
Palaeontologist

22nd October, 1965

D.M. 949/65

DEPARTMENT OF MINES
SOUTH AUSTRALIA

R/B 61/113

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KINGSTON-ON-MURRAY BRIDGE SITE, BORE NO. 5,

STRATIGRAPHY AND MICROPALAEONTOLOGY.

- Highways & Local Government Department -

ABSTRACT

A foundation test bore in the River Murray near Kingston-on-Murray penetrated river sands underlain by silts, rubbly limestones and sandy intercalations equivalent to the Pata Limestone, and bottomed in silts equivalent to upper Morgan Limestone.

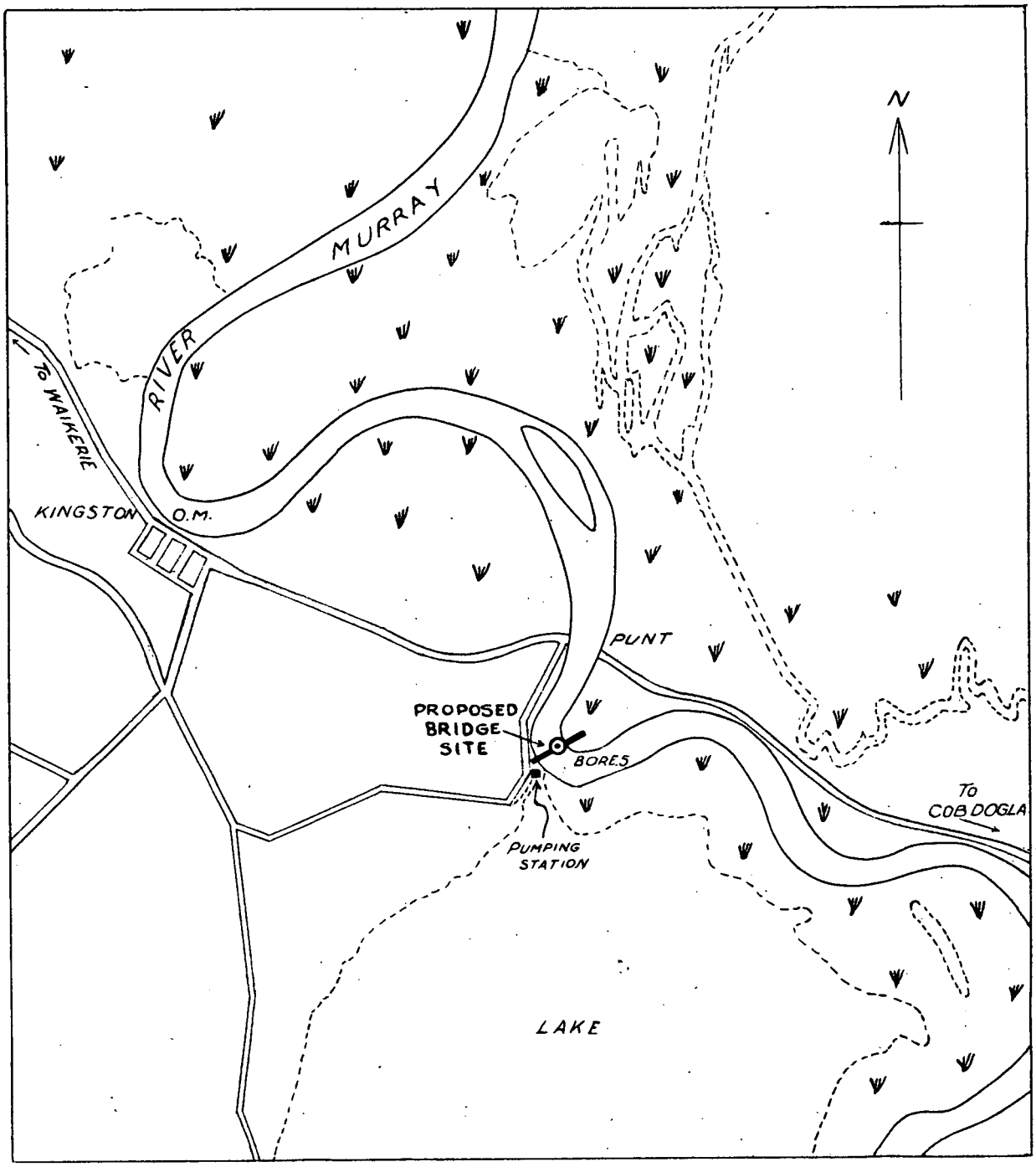
INTRODUCTION

A series of foundation test bores has been drilled by the Department of Mines for the Department of Highways and Local Government along the line of a proposed road bridge over the River Murray, 25 chains south of the Kingston-on-Murray Punt. Bore No. 5 was sited in 15.5 feet of water near the east bank of the river within county Hamley, Cobdogla Irrigation Area, and is plotted on the accompanying locality plan. Open-tube percussion core samples from this bore were submitted for palaeontological examination and stratigraphic correlation.

A lithological log was compiled by R.I. Chugg for K.W.G. Smith, consulting engineer, and has been freely used in the preparation of this report.

Stratigraphic data are based mainly on identification of more significant foraminifera, but no detailed study of the microfaunas was attempted.

Available records of previous drilling in the area are



SCALE

40 30 20 10 0 40 80 120 160

chains

To accompany Pal. Rept. 13/65 by J.M. Lindsay.

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	Drn. J.M.L.	KINGSTON-ON-MURRAY BRIDGE SITE BORE NO 5 LOCALITY PLAN	SCALE: As Above
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limited to data on foundation test bores for a proposed railway bridge 200 yards north of the Kingston-on-Murray Punt. (Miles, K.R. 1950. Geological report on railway bridge foundation test bores, Kingston-on-Murray, Geol. Surv. S. Aust. D.M. 901/49, unpublished). Sixteen bores ranging in depth from 10 to 80.5 feet were drilled in that programme and logged by Miles, but no palaeontological work was done. Miles reported clays and sands "underlain by a continuous horizon of Tertiary (probably Miocene) marine beds:- grey to grey-green sandy and calcareous clays and clayey limestones carrying abundant shells". Bore 5 of the present investigation shows a broadly similar sequence.

STRATIGRAPHIC SUMMARY

Formation	Depth (feet)	Thickness (feet)
Water (River Murray)	0 - 15.5	
River sands (Recent to ?Pleistocene)	15.5 - 35	19.5
Pata Limestone equivalents (?Middle Miocene)	35 - 74	39
Morgan Limestone equivalents (Lower to ?Middle Miocene)	74 - 95.5	21.5

FORMATIONS ENCOUNTERED

River Sands (Recent to ?Pleistocene)

These sands are brown to grey and fine to coarse-grained with mica generally sparse. They bear occasional lignitic fragments but are otherwise unfossiliferous. In Bore 5, near the eastern bank of the river they are 19.5 feet thick, but in the deeper parts of the river they are absent due to scour. Although

no fossil evidence of age is available, the sands from their nature and position are thought to be mostly Recent perhaps extending back into the Pleistocene. They are distinct from the Loxton Sands which are exposed in river cliffs nearby.

Pata Limestone equivalents (?Middle Miocene)

39 feet of calcarenitic silts and silty rubbly limestones with several sandy intercalations, are considered equivalent to the Pata Limestone, described by Ludbrook (1961, pp. 64-75). Parts of the sequence are lithologically similar to Bookpurnong Beds (Ludbrook, 1961, loc. cit.) of Upper Miocene to Lower Pliocene age (Ludbrook, 1963, p. 13), but the foraminiferal evidence indicates a Lower to Middle Miocene age for the whole sequence and extensive reworking of the microfaunas does not seem to have occurred.

Heterolepa victoriensis, restricted to Pata Limestone, occurs sporadically between 39 and 74 feet, and is abundant in the rubbly limestone at 51-52 feet.

Cassigerinella chipolensis, which ranges only as high as Lower to Middle Miocene is generally present in silts from 36.5 feet to the bottom of the bore.

Members of the Orbulina evolutionary sequence, also of Lower to Middle Miocene age, occur in the lower part of the formation (59.5 - 69 feet).

Between 47 and 68 feet, the silts are in part weakly lithified to rubbly silty limestones. There are sand intercalations between 54-59 feet and at 73 feet.

Morgan Limestone equivalents (Lower to ?Middle Miocene)

Grey calcarenitic silts from 74 feet to the bottom of the bore at 95.5 feet are comparable with an upper marly phase of Morgan Limestone encountered in the Waikerie district and ranging in thickness there from 20 to 70 feet (Lindsay, J.M. 1965, River Murray Drainage Investigation Progress Report No. 2, stratigraphy and micropalaeontology of bores and surface sections. Geol. Surv. S. Aust. Pal. Rept. 7/65, G.S. No. 3156, unpublished).

Heterolepa victoriensis does not occur below 74 feet; H. subhaidingeri enters at 82.5 feet, and Gypsina howchini at 87 feet.

DESCRIPTIONS OF SAMPLES

Depth (feet)	Description
15.5 – 16.5	Sand, mostly fine to medium-grained, brown, scattered mica flakes and rare small glauconite grains (reworked); occasional black lignitic fragments but otherwise unfossiliferous.
19.5 – 21.5	Sand, coarser than above, mostly medium to coarse-grained; occasional lignitic fragments but otherwise unfossiliferous.
26.5 – 30	Sand, fine to coarse-grained, well-sorted, pale brown, sparsely micaceous, unfossiliferous.
31 – 32	Sand, micaceous, fine to coarse-grained, pale greyish-brown, unfossiliferous.
32 – 33	Sand, brown, fine to very coarse-grained, mica very sparse, unfossiliferous.
34 – 35	Sand, greyish-brown as above; entry of the first few fragments of greenish and brownish-grey calcareous silt, very fine-grained sandy, glauconitic and ferruginous (frequent glauconite pellets often oxidized khaki-brown), finely fossiliferous with molluscan fragments small foraminifera and ostracods.

Depth (feet)	Description
35 - 36.5	Calcareous silt, finely shelly, greenish and brownish-grey, glauconitic as above, slightly clayey; molluscan fragments and foraminifera are abundant, the latter including Triloculina collinsi (R) *, Syratkina australiensis (F) and Operculina victoriensis (V).
36.5 - 37.5	Silt to marl, similar to above, with the entry of Cassigerinella chipolensis (R) and many other species of foraminifera.
37.5 - 39	Brownish-grey calcareous silt, clayey, fine-grained sandy, shelly and glauconitic, with rare Ditrupa tubes, frequent bryozoa and abundant foraminifera (mostly small) dominated by Operculina victoriensis (C, large) with Marginopora vertebralis (R, large).
39 - 40.5	Similar to above with abundant large Operculina, common Marginopora, and the entry of Austrotrillina howchini (R) and Heterolepa victoriensis (V).
40.5 - 42	Grey calcareous shelly silt and sand with a varied microfauna including Crespinella umbonifera (V) and common Cassigerinella chipolensis.
42 - 46	No samples available.
46 - 47	Calcareous silt, pale grey, finely shelly, slightly clayey and sandy, with Glycymeris (Tucetona) subtrigonalis (Tate), and a similar microfauna to above.
47 - 48	As above; slightly cemented in patches to silty limestone (calcarenite); foraminifera are somewhat recrystallized and include large Marginopora vertebralis up to 17 mm. diameter.
51 - 52	Darker grey rubbly silty limestone (calcarenite) and silt, part-cemented, recrystallized, finely glauconitic, with common Ditrupa and abundant Heterolepa victoriensis.
55.5 - 56.5	Interbedded pale grey rubbly limestone (as above) and brown fine to coarse-grained sand.
59.5 - 61	Pale grey calcarenitic silt with some cementation to silty limestone; foraminifera appearing at this level include Orbulina suturalis (R), Globigerinoides glomerosus "circularis" (V), G. "transitorius" (V), G. bispericus (V), Amphistegina lessoni (V) and Ehrenbergina osborneï (F); Heterolepa victoriensis (A) continues.

Depth (feet)	Description
65 - 66	Pale grey calcarenitic silt with Globigerinoides glomerosus "circularis" (V).
68 - 69	As above, and with Globigerinoides glomerosus "glomerosus" (V).
73 - 74	Sand, 73 - 73.3 feet, fine to coarse-grained with granules to 5 mm. subrounded, iron-stained pale brown; silty sand 73.3 - 74 feet, sparsely shelly, pale grey to pale brown, the lowest appearance of Heterolepa victoriensis (V).
77 - 78	Olive-grey calcarenitic silt, clayey, laminated in part, with abundant foraminifera.
82.5 - 83.5	Pale grey calcarenitic silt, slightly clayey, finely shelly; Heterolepa subhaidingeri (F) enters.
87 - 88	As above, with common Ditrupa, and the entry of Gypsina howchini (V).
92 - 83	As above, washing to a residue of fine shelly debris and foraminifera; Cassigerinella chipolensis is abundant.

* Scale of abundance of foraminifera in routine picking of washed samples:

A	=	abundant	(more than 25 specimens)
C	=	common	(11 - 25)
F	=	frequent	(6 - 10)
R	=	rare	(3 - 5)
V	=	very rare	(1 - 2)

J.M. Lindsay.

JML:JLP
22.10.65

J.M. LINDSAY
PALAEONTOLOGIST

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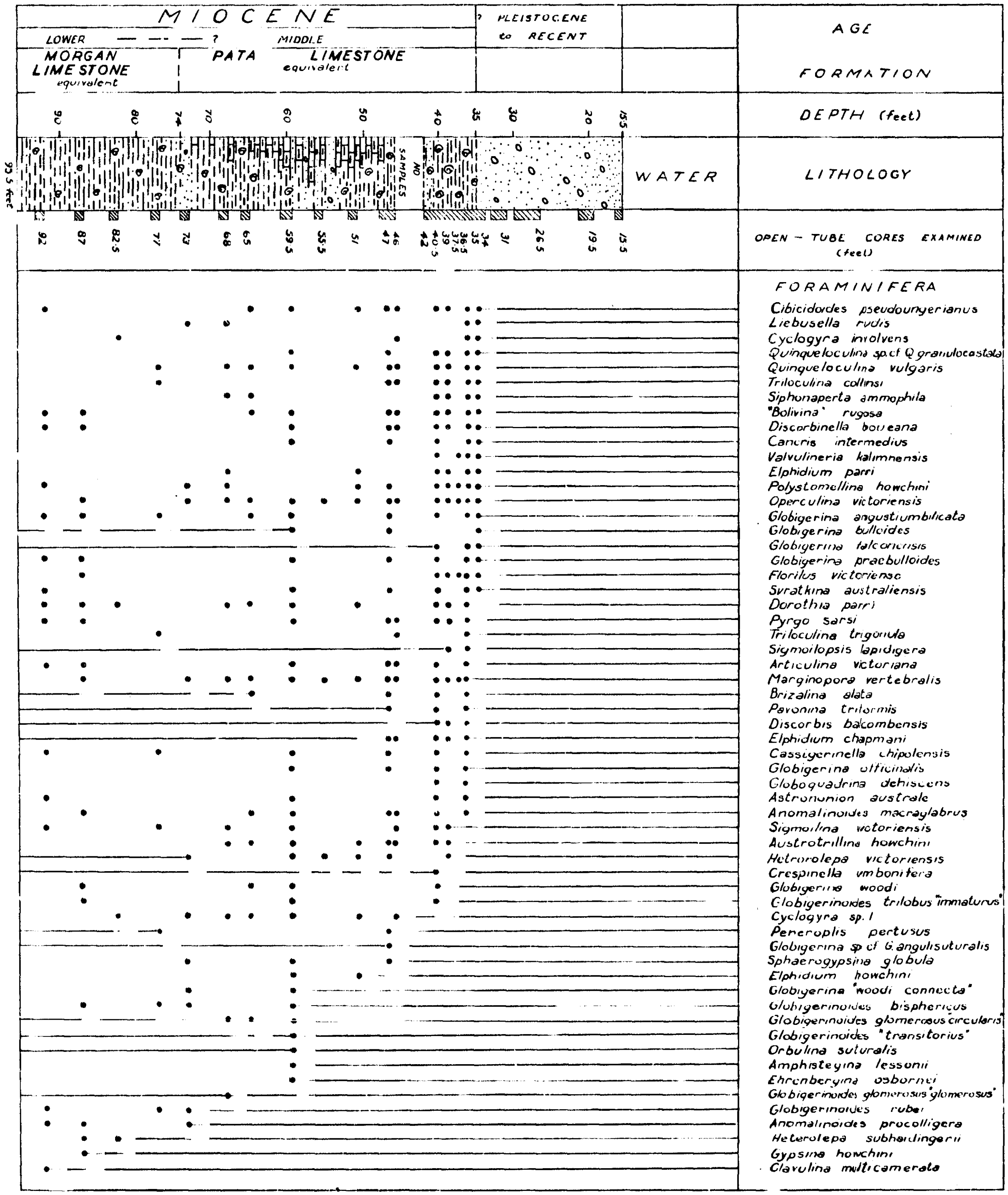

DEPARTMENT OF MINES — SOUTH AUSTRALIA

KINGSTON-ON-MURRAY BRIDGE BORE NO.5 COLUMNAR SECTION and MICROPALAEONTOLOGICAL LOG

Drn. J.M.L.	SCALE:
Tcd. A.H.D.	65-1190 G+J
Ckd.	
Exd.	DATE:

Director of Mines