#### COMMONWEALTH OF AUSTRALIA.

# **DEPARTMENT OF SUPPLY AND SHIPPING.**BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

REPORT No. 1948/66 Pal.Ser.28.



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MICROPALAEONTOLOGICAL EXAMINATION OF SAMPLES FROM THE ADELAIDE METROPOLITAN BORES. SOUTH AUSTRALIA.

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# MICROPALAEONTOLOGICAL EXAMINATION OF SAMPLES FROM THE ADELAIDE METROPOLITAN BORES. SOUTH AUSTRALIA.

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of Mines, Adeleide, for micropalaeontological examination. Two of these bores were put down in the plains to the north of Adelaide and the remainder in the area to the south of the city. Twenty-seven of the bores passed through or bottomed in the Lower Pliocene sandstones belonging to the Adelaidean Stage; fourteen bores penetrated the Middle Miocene sediments, which lie directly below the Lower Pliocene sandstones and which have been divided into the Balcombian and Janjukian stages; ten bores bottomed in beds assigned to the Balcombian Stage and four in the underlying sediments of the Janjukian Stage. The microfauna of these bores has been discussed in the report submitted by Mr. B. G. Cotton and myself in September, 1947, for incorporation in the final report on the underground water supply of Adelaide by Dr. K. Miles.

Two diagrams compiled by me and based on evidence derived from the microfaunal investigation of the bore samples, accompanied the report by Cotton and myself. One diagram represents a diagrammatic stratigraphic section showing the sequence of beds in the Adelaide basin together with the characteristic foraminifera of each horizon; the other is a structural contour map of the area under discussion, based on the microfaunal horizons.

A short account of the stratigraphic sequence is given below.

#### Recent.

The whole area is covered with Recent sands and travertimes but little of this material was represented in the bore
samples. Recent sands were encountered in Weymouth's Bore at
West Beach to the depth of 15 feet and the recent shallow water
foraminifer Rotalia beccarii was recorded.

#### Pleistocene.

Underlying the Recent deposits are further sands considered to be Pleistocene in age, and these are for the most part unfossiliferous. The greatest depth at which the Pleistocene sands were found overlying the Lower Pliocene fossiliferous deposits was at 425 feet in Bore No.18B. Fulham Reserve. In bores in the northern and southern part of the Adelaide Basin they overlie Middle Miocene sediments at much shallower depths.

# Lover Plicene Adelaidean Stage

. Underlying these Pleistocene sandstones in the central portion of the area are calcarcous candatones of Lower Pliocene age which contain a foreminiferal assemblage characteristic of the Adelaidean stage. The outstanding feature of these bores which penetrated the Adelsidean is the uniformity of cedimentation and of the microfaunal content. Two horizons have been recognised. A thin upper bed varying from 2 feet thick in Bore No. 41 at St. James Park to 49 feet in Bore No. 21 at Torrens Outlet Channel, Fulham, consists of an ochreous, fine grained, calcareous sandstone containing foraminifera. A lower bed. which has a maximum thickness of 183 feet in Bore No. 65 Wolseley Plantation, consists of a coarse, grey, calcareous sandstone which is uniform throughout the central portion of the basin and which contains a foraminiferal assemblage such as is found in the calcareous sandstone outcropping at Hallett Cove. about 13 miles south of Adelaide.

The foraminiferal assemblage comprised such species as

<u>Marginopora vertebralis</u>, <u>Cribrobulimina polystoma</u>, <u>Flinting</u>

<u>intermedia</u>, <u>Flintina triguetra</u>, <u>Valvulina davidiana</u>, <u>V.fusca</u>,

<u>Discorbis cycloclypeus</u>, <u>Elphidium rotatum</u> and <u>E.adelaidense</u>.

#### <u> Middle Niocene.</u>

#### a. Balcombian stage.

Sediments referable to the Middle Miocene were met with in ten bores and as yet no outcrop of beds containing a similar forminiferal assemblage has been found in the vicinity of Adelaide or in the area south at Aldinga. However, but exposures are known at various localities on the Nullarbor

Plains and around the shores of the Great Australian Bight.

The sediments consist of limestones and sandy limestones containing a foraminiferal assemblage which is regarded as characteristic of the Balcombian stage of Victoria. Typical species such as Austrotrillina howchini, which is of considerable zonal importance in areas outside Adelaide, Crespinella umbonifera and Operculina victoriensis which are associated with species which are also well represented in the overlying Adelaidean stage, such as Warginopora vertebralis, Epistomoria polystomelloides, Discorbis cycloclypous and Elphidium adelaidense. This assemblage is especially well represented in Bores Nos. 1 and 2 Direk north of Adelaide and in Bore No. 36 at Gatlands railway station south of Adelaide.

#### b. Janjukian stage.

Four bores penetrated the marks and sandy marks of the Janjukian stage, which contain a foraminiferal assemblage such as is found in the extensive deposits exposed in the coastal cliff sections south of Adelaide from Port Noarlunga down to Aldinga and at Hackham and Noarlunga a few miles inland. Foraminiferal species typical of the Janjukian stage in Victoria such as <u>Massilina torquayends</u> and <u>Sherbornina atkinsoni</u> were recorded.

#### Detailed Description of Bore Samples.

#### Bore No. 18.B. Fulham Reserve.

S.E. Corner Section 434, near Tapley's Hill Road, Hundred of Adelaide.

360-370 feet. Yellowish unfossiliferous sandstone.

426-530 feet. Grey calcareous sandstone with a few foraminifera and shell fragments.

### Foraminifera, Diccorbia cycloclypeus, Rotalia beccarii, Notorotalia clathrata,

The sample from 360 - 370 feet is of Pleistocene age.

The typical grey calcareous sandstone of the Adelaidean stage together with characteristic foraminifera extends from 426 feet down to 530 feet.

Bore No. 19, Holbrook's Road Bridge, Underdole,

- In Waterworks Depot at S.W. End of Bridge, Section 97, Hundred of Adelaide.
- 420-425 feet. Ochreous sandstone with foraminifers and molluscan fragments.
  - Poraminifera. Guttulina problema. Rotalia beccarii.

    Elphidium crispum. E. rotatum.
- 427-438 feet. Hard to friable, grey clacareous sandstone with foraminifera.
  - Poraminifera. Quinqueloculina vulgaris, Triloculina fricarinata, Marginopora vertebralis, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. crispum.
- 438-480 feet. Friable sandstone with foraminifers and a few mollusco.
  - Foraminifera. Quinqueloculina costata, Q. schreibersianna,
    Q. polygona, Q. ammophila, Massilina lapidigera,
    u/ Cribroblimina polystoms, Clavulina multicamerata,
    Barginopora vertebralis, Sorites marginalis,
    Guttulina problema, Discorbis dimidiata, D.
    cycloclypeus, Notorotalia clathrata, Rotalia
    beccarii, Elphidium adelaidense.
- 486-490 feet. Calcareous sandstone with numerous moliusca.

The samples from 420 feet down to 490 feet belong to the Adelaidean stage and contain numerous characteristic foraminifers. The thin upper bed extends from 420 feet down to 425 feet and the typical grey calcareous sandstone of the lower bed from 427 feet down to 490 feet.

Bore No. 20, Findon Road, Findon.

N. W. Corner, Section 526, Hundred of Yatala.

345-362 feet. Ochroup sand with a few worn forswinifera.

Foraminifers. Rotalia beccarii, Discorbis cycloclypeus. 393-440 feet. Grey shelly sandstone with a few foraminifers.

Poraminifera. Quinquelcculina ammorbila, Q. limbata,
Q. vulgaris, Cribrobulimina polyetoma, Delosina
sp., Guttulina regins, Discorbis cycloclypeus,
D. austrolis, Notorotalia clathrata, Rotalia
beccarli, Epistomaria polyetomelloides, Peneroplis planatus, Sorites marginalis, Elphidium
adelaidense, E. argenteum, E. crispum.

All samples are inthe Kalinktxonnantenex Adelaidean tatage, the upper bed being represented in samples from 345 feet down to 3

362 feet, and the lower bed from 362 feet down to 440 feet.

Foraminifera are not common, but are typical of the Adelaidean stage.

#### Bore No. 21, Torrens Outlet Channel, Fulhem.

N.E. Corner of Intersection of Torrens Outlet Channel and Henley
Beach Road, Section 220, Hundred of Adelaide.

331 feet. Coarse grit.

340 feet. Cream coloured calcareous grit with foraminifera.

Foraminifera. Triloculina tricarinata, Valvulina fusca,
Cribrobulimina polystoma, Discorbis cycloclypeus,
D. acervulinoides, Rotalia beccaril, Elphidium
crispum, E. rotatum.

346 feet. Cream coloured sandstone with foraminifera.

Foraminifera. Clavulina multicamerata, Discorbis cycloclypeus, D. dimidiata.

359-384 feet. Brownish sandstone. No fossils.

387-389 feet. Whitish calcareous sandstone with foraminifera.

Foreminifera. Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Gaudryina rugesa, Verneuilina triquetra, Marginopora vertebralia, Discorbis cycloclypeus, D. acervulinoides, Epistomaria polystomelloides, Rotalia beccarii.

389-432 feet. Grey calcareous sandstone with foreminifers and mollusca, small shells being very common at 402-404 feet.

Foreminifera. Quinqueloculina ammphila, Q. polygona, Q. disparilis, C. vulgaria, Q. seminulum, Triloculina tricarinata, Spiroloculina excavata, Flintina triquetra, Massigilina lapidigera, Valvulina davidiana, Cribrobulimina polystoma, Nubecularia lucifuga var. lapidea, Clavulina difformis, Gaudryina ef. rugosa, Marginopora vertebralia, Fenercelia planatus, Pseudopolymorphina doanei, Sigmoidella elegyantissima, S. Kagaensia, Guttulina yabei, G. problema, G. regina, Crbulina universa, Cibicides ungerianus, Notorotalia clathrata, Econides repandus, Discorbis orbicularia, D. cycloclypeus, Rotalia beccarii, Epistomaria polystomelloides, Kiphidium adelaidense, E. parri, E. crispum, E. rotatum.

475-487 feet. Fine grained, friable, calcareous sendstone with .

foreminifera and mollusca.

Foraminifera. Quinqueloculina ammophila, Q.limbata, Q. seminulum, Cribrobulimina polyetoma, Guttulina problema, Rotalia beccarii, Discorbis cycloclypeus, Cibicides ungerlanus, Motorotalia clathrata, Elphidium adelaidense, E. advenum, E. crispum.

The sample at 351 feet is referred to the Pleistocene. From 340 feet down to 487 feet, the bore passed through the beds of the Adelaidean stage at, the lithology from 340 feet down to 389 feet exhibiting a slight change in facies. The foreminiferal assemblage is typical of the Adelaidean stage.

#### Bore No. 25, Marion Road, Vermont.

W. Boundary. Section 91, Hundred of Adelaide.

155-160 feet. Dark cream coloured bryozoal sandstone, with
foraminifera, and poorly preserved bryozoa and
ostracoca.

Foreminifera, Textularia fistuloso, Dorothia parri,
Sigmoidella elegantissimo, Sigmomorphina subregularia, Calcarina verriculata, Discorbis
cycloclypeus, D. australis, Gibicides victoriensis, Notorotalia, howchini, Rotalia beccarii,
(r), Sherbornina atkinsoni, Operculina victoriensis, Amphistegina sp.

Catracous. Cythere postdeclivis.

160-200 feet. Ochreque, calcareous sandstone.

Poraminifera, Guttulina (Sigmoidina) silvestrii, Amonalina gonionoides, Sherbornina atkingoni, Galcarina verriculata, Eponides scabriculus, Amphietegina lessonii.

200-254 feet. Ochrecus sandstone with foraminifera, corals, brachiopoda, bryozoa, mollusca, and ostracoda.

Foreminifera. Quinqueloculina vulgaria, Q. polygona,
Massilina torquayencia, Sigmoilina victoriansia,
Cornuspira involvena, Reussella cf. enziformia,
Guttulina irregularia, Pseudopolymorphina rutila
var. parri, Sigmomorphina vaughani, Sherbornina
atkinsoni, Calcarina verriculata, Eponides
scabriculus, Carpenteria rotaliformia, Nonion
victoriansia, Amphistegina lessonii.

Ostracoda. Beirdia amygdaloides, Bythocypria tumefatta.

The samples from 155 feet down to 160 feet contain

foraminiferal species typical of the Balcombian stage. At 160

feet the bore passes into the Janjukian stage in which such zonal species as Bassilina torquayessis and Sherbornina atkinsoni are present.

#### Bore No. 27.4. Grange Road, Welland.

S. boundary, Section 389, Hundred of Yatela.

375-390 feet. Ochreous sandstone.

390-393 feet. Hard shelly sandstone with foraminifera.

Foraminifera, Guttulina lactea, Discorbis cycloclyeus, Rotalia beccarii, Elphidium rotatum,

393-410 feet. Grey calcareous sandstone with foraminifera and many shells worn and broken.

Foraminifera. Avinqueloculina ammophila, Triloculina tricarinata, Harginopora vertebralia, Sorites marginalis, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. rotatum.

410 feet. Friable chelly sandstone with foraminifers and ostracoda.

Foreminifera. Earginopora vertebralis. Peneroplia planatus. Discorbis cycloclypeus. Elphidium rotatum.

Ostracoda. Loxoconcha australia.

Unfossiliferous Pleistocene sandstones are present at 375-390 feet. The bore passes into the fossiliferous beds of an the Adelaide/stage at 390 feet which extend down to 410 feet. Typical foraminifera are present.

# Bore No. 28, Trimmer Parade, Woodville Grove. N. Boundary Section 425, Hundred of Yatala.

320-340 feet. Othreous to whitish sandstone.

360-870 feet. Coarse, reddish, shelly sandstone with foreminifera.

Forominifera. Marginopora vertebralia, Clavolina multicamerata, Sigmoidella elegantiasima, Discorbia cycloclypeus, D. dimidiata, Rotalia beccarii, Elphidium adelaidense.

380 feet. Calcareous sandstone, with numerous foraminifera and mollusca.

oraminifera, Pyrgo bulloides, Guinqueloculina disparilie,
Q. polygona, Q. lamarckinana, Q. ammophila,
Hassilina lapidigera, Triloculina tricarinata,
Flintina triquetra, Spiroloculina antillarum,
Valvulina davidiana, V. fusca, Nubecularia
lucifuga ver. lapides, Cribrobulimina polystoma,
Clavulina multicamerata, Harginopora vertebralia
(c), Sorites marginalis, Peneroplis planatus,
Sigmoidella elegantissima, S. kagaensis, Cuttulina
problema, G. regina, Pseudopolymorphina doanei,
Discorbis cycloclypeus, D. dimidiata, D. orbicularis, Epistomaria polystomelloides, Rotalia

beccarli, Elphidium adelaidense, E. crispum.

385 feet. Calcareous candatone with foraminifers and a

few mollusca.

Foraminifera. Quinqueloculina ammorhila, C. dieparilic.
Q. polygona, Massilina lapidigera, Triloculina
tricarineta, Flintina triquetra. Spiroloculina
excaveta, Clavulina differmia, Cribrobulimina
polystoma, Rubecularia lucifuga var. lapidea,
Marginopora vertebralia, Peneroplia planatus,
Soritea marginalia, Sigmoidella elegantissima,
Notorotalia elathrata, Rotalia beccarii, Epistomaria polystomelloidea, Discorbia dimidiata,
D. cycloclypeus, Elphidium parri, E. rotatum,

590 feet. Hard, chelly limestone with <u>Marginorora vertebrelis</u>.

410 feet. Shelly limestone with large pelecypoda.

Beds of Pleistocene age are represented by unfossiliferous sandstones from 320 feet down to 340 feet. The fossiliferous beds of the Adelaidean stage occur from 360 feet down to
410 feet: Typical Adelaidean foraminifera are numerous,

<u>Harginopora vertebrulis</u> being common at 380 feet.

Bore No. 29, Marion Road, Harcourt Gardens. W. Boundary, Section 88, Hundred of Adelaide.

135-140 feet. Yellowish calcareous sandstone with foraminifera.

Foraminifera. Peneroplis planatus, Nonion sp.

153'6"-196'6". Deep cream coloured coloursous sandstone with foraminifers.

Foraminifera. Frondicularia lorifera, Guttulina luctea, C.

(Sigmoidina) silvestrii, Cancris ovatus, Discorbis australis, Patellinella sp., Gypsina howchini, Planorbulinella plana, P. inaequilateralis, Sherbornina sp. nov., Calcarina verriculata, Rotalia beccarii (r), Spondes scabriculus, Miniacina minuta, Astronomion australe, Romion sp., Elphidium pseudoinflatua, E. crespinae, Operculina victoriensis.

196-200 feet. Ditto, with foraminifera.

Foraminifera, Sigmoidella elegantissima, Sherbornina sp. nov.,
Planorbulinella insequilateralis, Eponides scabriculus, Cibicides victoriensis.

The sample at 135-140 feet represents the upper bed of the Adelaidean stage and contains typical foraminifera. The bore passes into the Balcombian stage at 153 feet 6 inches and is still in that stage when it bottomed at 200 feet. Characteristic foraminifera are present.

#### Bore No. 30, Morphett Road, Camden North.

S.W. Corner, Section 153, Rundred of Adelaide.

212-229 feet. Whitish to yellowish sandstone. No fossile. 229-250 feet. Whitish to yellowish sandstone with a few

foraminifera.

Foraminifera. Cribrobulizina polyetoma, Clavulina multicamerata, Discorbis cycloclypeus, Rotalia beccarii,
Epistomaria polystemelloides, Elphidium crispum.

250-272 feet. Grey calcareous sandstone with foraminifere and

Foraminifera, Pyrgo bullcides, Quinqueloculina ammophila, Q. disparilis, Q. vulgaris, Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Marginepora vertebralis, Sorites marginalis, Sigmoidella elegantissime, S. kagaensis, Guttulina problema, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. crispum, E. rotatum,

Unfossiliferous sandstone of Pleistocene age occur from 212 feet down to 229 feet. Lower Pliocene sediments are present from 229 feet down to 272 feet, and foraminifera of the Adelaidean stage are moderately common. The fine grained sandstone of the upper bed extends from 229 feet down to 250 feet and the coarse grey sandstone of the lower bed from 250 feet down to 272 feet.

#### Bore No. 31, Keele Bridge, Lockleys.

Near S.W. End of Bridge, Section 144. Hundred of Adelside.

329-370 foot. Frieble sanastone. No fossile.

378-409 feet. Calcareous sandstone with numerous foraminifers.

Foraminifera. Ovinqueloculina vulgaria, Triloculina tricarinata, Reophax scorpiurus var. testacea,
Clavulina multicamerata, Cribrobulinina polystoma,
Velvelina fusca, V. davidiana, Sorites marginalia,
Harginopora vertebrelia, Guttulina problema O.
regina, Pyrulina sp., Pseudopolymorphina doanei,
Sigmoldella elegantissima, Discorbia cycloclypeus,
D.dimidiata, Rotalia beccarii, Eristomaria polystomelloides, Elphidium crispum, E. adelaidense,
E. argenteum,

409-480 feet. Grey calcareous sandstone with foraminifera and shell fragments.

Poraminifera. Pyrgo anomala, Quinqueloculina ammophila,
Q. lemarckiana, Q. costata, Q. vulgaria, A.seminulum, Wassilina lapidigera, Cribrobulimina
polystoma, Marginopora vertebralia, Sorites

marginalic, Peneroplis planatus, Guttulina irregularis, G. problema, G. yabei, Pseudopolymorphina sp., Discorbis dimidiata, Rotalia heccarii, Cibiciaes ungerlanus, Notorotallia clathrata, Elphidium argenteum, S. parri.

The unformiliferous mandatone from 329 feet down to 370 feet are referred to the Pleistocene. The fossiliferous hads from 378 feet down to 480 feet are Lower Pliocene and contain numerous forsminifers typical of the Adelaidean stage.

Bore No. 36, Railway Station, Oaklands,

S. W. Corner. Section 154, Hundred of Noerlunge.

200-218 feet. Grit with worn foraminifera, bryozoa, shell fragments, ostracoda and glauconite grains.

Foraminifera. Reochax sp., Dentalina obliqua, D. soluta,
Signoidella elegantissima, Siphonina nustralis,
Cibicides victoriensis, Rotalia beccarii (r),
Astrononion sustrale, Siphidium argenteum, E.
adelaidense, E. parri.

Ostracoda. Cythere flexicostata.

218-220 feet. Hard grey limestone with glauconite, foraminiferaand poorly preserved bryozoa.

Foraminifera. Narginopora vertebralis, Austrotrillina howchini (common), Gperculina victoriensis.

220-226 feet. Ditto with foraminifera common.

Foraminifera. Quinqueloculina vulgaris, Dorothia parri,

Austrotrillina howchini, Marginopora vertebralis,

Dentalina fissicostata, Sigmoidella elegantissima,

S.kagaensis, Glandulina laevigata, Guttulina
regina, G. irregularis, Gypsina howchini, Miniacina minutum, Acervulina inhaerens, Spirillina
decorata, Cibicides victoriensis, Siphonina
australis, Epondides repandus, E. scabriculus,

Anomalina glabrata, Menion depressulus, Elphidium
parri, E. adeloidense, Amphistegina lessionii,
Operculina victoriensia.

<u>Detraceda.</u> <u>Cythere dictyon, Cytherepteron batesfordiense.</u>

<u>226-260 feet.</u> Bryoscal limestone, with glanconite grains very common, also foraminifera, cerals, bryosca poorly preserved and estraceda.

Foraminifera. Quinqueloculina vulgaris, Q. lamarckiona, Q. ammachila, Triloculina tricarinata, Austrotrillina howchini, Darginopora vertebralis, Dorothia parri, Sigmoilina victoriensis, Sigmoidella elegantissima, Quttulina regina, Globulina gibba, Discorbis cycloclypeus, Cibicides victoriensis, Carpenteria proteiformis, Amphistegina lessonii, Elphidium parri, E. adelaidence, E. chapmani.

Ostracoās. Cythere rostacclivis, Cytherepteron batesfordiense.

260-270 Test. Cresm coloured limestons, with fossils almost completely altered.

Foraminifera. Gycsina howchini, Elphidium charmani, E. ep., Operculina victoriensia.

<u>270-310 feet.</u> Dark grey colcareous sandstone, with numerous foreminifera.

Foraminifera. Triloculing tricerinata. Sigmoiling victoriensis, Cornuspira involvens, Derothia parri,
Liebusella antipodum, Gaudryina collinsi.
Cassidulina subglobesa. Triferina bradyi, Legena
apiculata, Dentalina soluta, Frondicularia
lorifera, Guttulina lactes, G. irregularis, G.
(Sigmoidina) silvestrii, Pseudopolymorphina
rutile var. parri, Sherbornina atkinsoni, Spirillina decorata, Eponides scabriculus, Cibicides
victoriensis, C. sp. 2, Anomalina noniopoldes,
A. glabrata, Planorbulina mediterrazensis,
Elphidium parri, E. crassatum.

310-350 feet. Cream coloured, calcareous, sandstone with foraminifera end <u>Ditrupa</u> tubes.

Poraminifera. Textuloria sagittula, Clavulinoides szaboi var.

victoriensis, Dentalina obliqua, Sigmoidella
elegantissima, S. kagaensis, Sigmomorphina subreguloris, Guttulina (Sigmoidina) silvestrii, G.
regiaa, var. crassicostata, Sherbornina atkinsoni,
Carpenteria rotaliformis, Miniacina minuta,
Calcarina verriculata (c), Cibicides victoriensis,
Gypsina howchini, Sherbornina sp. nov., Discorbis
balcombensis, Craspinella umbonifera (c), Astrononion australe, Elphidium adelaidense, E. parri,
Operculina victoriensis (c).

Ostracoda. Cythere postdeclivis.

<u>580-400 feet.</u> Yellowish calcareous sandstone, with numerous grains of brown glauconite, foreminifers and poorly preserved bryozoa.

Poraminifora, Dorothia parri, Clavulinoides ezabci var.
victoriensis, Sigmoidella elegantissima, Sherbornina ep. nov. S. atkinsoni, Discorbis bertheloti var. papillata, Carpenteria rotaliformis,
Calcarina verriculata, Cibicides victoriensis,
Eponides scabriculus, Grespinella umbonifera,
Elphidium parri.

The grit at 200 - 218 feet contains a mixed assemblege of Lower Pliocene and Middle Miocene forominifers.

From 218 feet down to 400 feet, the base of the bore, the samples are Middle Miocene in age and belong to the

Felcombian stage. The upper zone of the stage is represented from 218 feet down to 270 feet, the zonal foraminiferal species Austrotrilling howehing being common. The lower sone occurs from 270 feet down to 400 feet, in which the zonal species Crescinella umbonifers is prominent.

Bore No. 57. West Beach Road, Promore

N.W. corner of intersection Tabley's Hill and West Beach Rosce, Section SIV. Musdred of Adglesses

341 feet. Fine angular to rounded, quarts grains. No fossila.

343-362 feet. Quarts and with foraminifero including large tests of Rotalia beccarii.

Foraminifere. Textularia sp., Revesella sp., Cribrobulimina polystoma. Discorbis eveloclypens, E. stellformis, Norton sp., Fightelum crispus, E. argentagnis

374-394 feet. Fals grey calcareous sandatone with numerous foraminifers, chiefly worn and broken, and a few molluscan fragments and ostracous.

Foreminifera. Guinqueloculina costata, Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Narginopora vertebralis, Sprites marginalis, Anomalina of polymorpha, Discorbia cycloclybeus, Roislia becessi (very common), Discorbinalia bisoncava, Siphidium adelaidense,

Macrocypria tunida, Lozocoucha australia.

404-414 feet. Grey calcareous sandstone with foraminifera

(Earginopora vertebralis common), shell fragments
and fish otoliths, all worn and broken.

424-450 feet. Calcareous sandstone with foraminifers (Warxinopora seerce), bryozoa, abundant molluscen fragments and ostracoda.

Forsminifors. Suinqueleculina ammonila, S. polygona,
G.lemarckiana, Filoculina tricarinata, Clavulina
difformia, G. multicamerate, Tibrobulimina
polystoma, Marcinopora veriebrolia, Sizmoidella
kagaensis, S. elegantissima Guttulina problema,
Notorotalia clathrata, Rotalia beccarii,
Elrhidium parri, S. adelaidense.

Divorde Control Control

Ostracoda. Cytherella lata.

Ostracodo.-

460 feet. Shelly grit with worn foraminifera, mollusca, ostrecode and glauconite grains.

Poruminifera. Triloculina tricarinata, Sigmoilina australia, Cribrobulimina polyatoma, Clavulina multicamerata, Taxtularia abbreviata, Lagena hexagona, Dentelina of. obliqua, Guttulina problema, Baggina philippinensia, Discorbia australia, D. cycloclypens, Rotalia beccarii, Cibicides ungerianna C. of. victoriensia, Notorotalia clathrata, Elphidium adelaidensa, E. crispum, E. parri.

Catracoda. Hacrocypris decora, Bairdia subdeltoides, Loxoconcha australia, Cytheropteron ap.

The sample at 541 feet is Fleistocene in age. The fessiliferous sandstone from 548 feet down to 460 feet contains numerous broken tests of Adelaidean formainifers.

## No boundary. Section 94. Hundred of Adelaide.

330-390 feet Quartz sand.

590-406 feet Calcareous sandstone.

410-426 feet Hard to friable, grey calcareous sandatons with a few foreminifers and mallusca.

Foreminifers. Triloculina tricarinata, Cribrobulinina polystoma, Rotalia beccarii, Elphidium adelaidense; E. rotatus.

426-440 feet. Shelly sandstone with foreminifere.

Foreminifere. Quinqueloculine vulgaria. Cribrobulimina polystana, Rotalia beccerii. Elubidium adelaidense.

The quartz sand from 380 feet down to 390 feet is

Pleistocene in age. The characteristic deposits of Adelsidean

Stage (thexximalizatix mandature) extend from 590 feet down to

440 feet, the upper portion being represented from 390 feet down
to 406 feet and the lower from 410 feet down to 460 feet.

Typical Adelsidean formulaifers are present.

Bore Mo. 39. Flinders Fark.
N.W. Corner, Section 391. Hundred of Yatala.

360-408 feet. Fine quarts sand with grains chiefly rounded.

405-406 feet. Yellowish calcareous sandstone, with foraminifera.

Forminifers. Rotalia beccarii.

405-485 feet. Greyish sandstone with foreminifere.

Formainifera. Quinqueloculina ammophila, Triloculina tricarinate, Esperimopora vertebralla, Signoidella eleganticaina, Rotalia becearii, Elphidium adolaidense.

425-465 feet Grey calcareous sandstone, with foraminifera.

Foraminifere. Quinqueloculine bouesna. Cribrobalinine polystome. Clavuline multicomerata. Sigmoidella elegentiasine. Guttulina proheme. Discorbis evelociypeus. Rotalis becerii. Niphidium adelandense.

Unfossiliferous Fleistocene sends occur from 360 feet down to 403 feet. Lower Fliocene fessiliferous sandstone occur from 403 feet down to 456 feet, typical foraminifera of the Adelaidean stage being fairly common. The upper bed of fine sandstone extends from 405 feet down 406 feet and the lower one of coarse grey sandstone from 406 feet down to 456 feet.

Rore No. 40. Sheriff St., Fremanton.
Towards S. end. centre of Section 96. Hundred of Adelaide.

355-383 feet. Sandstone consisting of rounded to angular quartz grains.

584-400 feet. Hard calcareous sandstone with Marginopora.

400-425 feet. Grey calcareous sandstone with foraminifera and mollusca.

Foreminifere. Introductionaline same phile, G. Ismarckiane,
G. vulgarie, Price elementa, Triloculine fricarinata

Sarginopora vertebralle, Gribrobulimine nolystome,
Valvuline fusce, Clavuline multicamerate, Guttuline
probleme, Limeidelle kagaenale, S. Giorantisaime,
Notgrotalia clathrate, Discorbis cycloclypeus,
Rotalia beccari, Elphidium crispum, E. adelaidense,
E. cf. maccium.

425-475 feet. Friable calcareous sandstone with numerous foreminifers.

Foreminifers. Quinqueloculina ammonhila. A. lamarckiana.
Q. vulgaria. Q. dispariis. Q. polygona. Q.
schreibersiana. Triloculina tricarinata. Hassilina
lapidizere. Spirolaculina excavata. S. regularia.
Cribrobulinina polyatoma. Valvulina fusca.
Clavulina multicamerata. Listerella communia.
Marginenora vertebralia. Globulina gibba. Guttulina
regina. G. regina ver crassicoatata. Sigmoidella
tagaensia. Discorbia australia. L. orbicularia.
D. cycloclypena. Actalia beccarii. Epistomaria polystome loides. Sciorotalia ciathrata. Elphidium
adelaidenee. E. Gristum.

Fleistocene sandstones occur from 355 feet down to 388 feet. Lower Fliocene calcareous sandstones are present from 384 feet down to 475 feet and contain a rich and characteristic assemblage of Adelaidean foraminifers.

### Bore No.41, St. James Park, 5.E. Corner, Section 413, Hundred of Yatala.

340 feet Yellowish sandstone, with a few foraminifera.

Foraminifera. Rotalia beccarii, Elphidium crispum.

354 feet. Limonitic to whitish sandstone.

384 feet. Ochreous sandstone, with foraminifera.

Foraminifera, Clavulina multicamerata, Peneroplia planatus, Marginopora vertebralis, Discorbia dimidiata, D. cycloclypeus.

386 feet. Grey, calcareous sendstone, with foreminifers and poorly preserved molluscan shells.

Foraminifers. Quinqueloculino vulgaria, Triloculina tricarinata, Nubecularia lucifuga var. lapidea, Marginopora vertebralia, Guttulina problema, Sigmoidella kagaensia, Discorbia cycloclypeus, Elphidium adelaidense.

405 feet. Grey, celcareous sandstone, with foraminifera.

Foreminifera. Quinqueloculina anmophila, Massilina

lapidigera, G. boueana, Valvulina davidiana,
Gribrobulimina polystoma, Peneroplis planatus,
Sorites marginalis, Harginopora vertebralis,
(common and large), Sigmoidella clegantissima,
Discorbis evelocypeus, D. dimidiata, Notorotalia
clathrata, Epistomaria polystomelloides, Elphidium
adelaidense.

407-413 feet. Grey, calcareous sandstone with foraminifera and abundant rod-like bodies,? algae.

Foreminifera. Triloculina tricerinata, Nubecularia lucifuga
var. lapidea, Cribrobulimina polyatoma, Valvulina
davidiana, V. fusca, Marginopora vertebralia,
Sigmoidelia kagaensia, Epistomaria polyatomelloidea
Rotalia beccarii, Discorbia cycloclypeus, D.
dimidiata, Elphidium adelaidense.

424 feet. Friable, grey, calcareous sandstone, with numerous foreminifers.

Forsminifera. Suinqueloculina bouesna, Sigmoilina australia,
Miliolinella oblonga, M. bucculenta, Triloculina
tricarinata, Spiroloculina excavata, Valvulina
davidiana, V. fusca, Sorites marginalis, Marginopora
vertebralia, Feneroplis planatus, Reophax scorpiurus
var. testacea, Clavulina multicamerata, Cribrobulin
ina polystoma, Discorbis cycloclypeus, Epistomaria
polystomelloides, Rotalia beccarii, Elphidium
adelaidense.

The sandstones from 340 feet down to 354 feet are referred to the Pleistocene and small foraminifers are present at 540 feet. Lower Pliocene calcareous sandstones occur from 384 feet down to 424 feet and contain numerous Adelaidean foraminifers. Tests of

<u>Marginopora vertebralia</u> are large and common. The sample at 407-413 feet contains abundant rod-like bodies which are referred tentatively to algae.

#### Bore No. 47. Glendore. Centre of N. end. Section 51. Hundred of Adelaide.

110 feet. Quarts sand. No fossils.

120 feet. Ochreous calcareous sendstone with poorly preserved foraminifera and bryozos.

Foreminifers. Cuinqueloculina sp., Discorbis sp., Eponides sp

120-124 feet Sand with fragments of ochreous calcareous sandstone with bryozoa.

184-185 feet. Fine engular quartz sand with foraminifera, sponge spicules, and bryozon.

Foraminifera. Sherbornine atkinsoni, Fullenia quinqueloba, Cibicides ungerianus, Anomalina nonionoldes, Discordia bertheloti, Gyogina globulus, Calcarina verriculata, Amphistegina lessonii.

Spongide. Eclomera newbervi.

134-159 feet. Pale ochreous, calcareous sandatone with foraminifera.

Foraminifera. <u>Guinqueloculina vulgaria</u>, <u>Dorothia parri</u>,

<u>Calcarina verriculata</u>, <u>Crespinella umbonifera</u>,

<u>Amphistegina lessonii</u>.

159-174 feet. Fine grained, friable sandstone, with foraminifera.

- Foreminifers. Suinqueloculina vulgaria. S. seminulum, Sigmoiling victoriensia, Massilina torquayensia, Cassidulina subglobosa, Sigmoidella elegantissima, Sherbornina atkinsoni, Cibicides ungerianus, C. refulgens, C. victoriensia, C. sp. 2, Discorbia orbicularia, D. cyclocivpeus, Anomalina grosserugosa, A. nonionoides, Notorotalia hewchini, Eponides scabriculus, Nonion umbilicatula, Crespinella umbonifera, Amphistegina lessoni.
- 174-240 feet. (1) Grey sandstone with glauconite grains and foreminifers.
  - Poreminifers. Pyrgo bullides, Quinqueloculina vulgaria,
    Massilina torquayensis, Triloculina tricarinata,
    Sigmollina victoriensis, Gaudryina rugosa, Lasena
    laevis, Dentalina obliqua, D. soluta, Lenticulina
    articulata, Globulina gibba, Guttulina problema,
    G. lactea, G. lrregularia, Discorbia balcombensia,
    Sherbornina atkinsoni, Eponides scabriculua,
    Cibicides ap. 1, Anomalina grosserugosa, Amphistosing lessonii.
    - (2) and (5). Greyish sandstone with foraminifera, a few bryozos, and broken mollusca.

Poreminifere. Guinqueloculine vulgaris, G. lemerekiene, friloculine tricarinets, Nassiline torquarensis, Signolline victoriensis, Buliminelle apiculate, Cassiduline aubalobosa, Reonhaz scorniurus var. testaces, Denteline solute, Clobuline gibbs, Gutuline (Signoldine) silvestri, Anomeline gibbs, Gutuline (Signoldine) silvestri, Anomeline gibbata, Sherbornine stimaoni, Sponides scabriquius, S. repandus, Cibicines sp. S. Fianorbulbella plane.

(5). Fine sendstone with numerous foreminifera.

Foreminifers. Pyrgo spensia. P. bulloides, Quinqueloculina agglutimens. G. costata. C. seminulum. Q. cf. rects. G. polygona, G. schrelbergiana, Q. venuste. G. vulgeris. Triloculina tricarinata. Sigmoilina victoriensis, Spiroloculina canaliculate. Mascilina torquayensis. Cornuspira involvens. Dorothia parri. Leibusella satipedum. Textalaria siphonifers. Buliminella spiculata. Bolivinalia folia. Reussella. sp. Cassidulina subglobosa. Colina favospunctata. Dentelina cf. spirostriolata. D. fissicoatata. Dentelina cf. spirostriolata. D. fissicoatata. Dentelina cf. spirostriolata. D. fissicoatata. Cularia lorifera. Clandulina laevigata. Pseudopolymorphina rutila var. parri. Guttulina irregularia. G. lactes. G. (Sigmoidina) silvestrii. G. problema. Globulina gibbs. Sigmomorphina cf. wynwardensis. S. cf. vaughani. S. regularia. Spirillina iuberculata. Gypsina globulus. Sherbornina atkinsoni. Posides scabriculus. E. repandus. Dyocibicides biserialia. Calcarina verriculata. Elphidium heychini. Amphistegina lessonii.

The unfossiliferous sands which came from the shallow depth of 110 feet are most probably Sub-Recent in age. The fossiliferous sandstones from 120 feet down to 240 feet are Middle Miecene and belong to the Janjukian stage such as is developed at Aldinga. Typical foraminifera, Massilina torquayensis and Sherbornina atkinsoni are present.

N. end of Ovel. Section 403, Sundred of Yetale.

310-320 feet. Angular to rounded quartz grains.

mocont

320-356 feet. Ochreous sandstone with foreminifers and molluses.

Foreminifers. Triloculina tricarinata, Marginopora vertebralis, Mubecularia lucifusa var. lapides, Discorbis dimidiata, D. eveloclypeus, Rotalia beccarii, Elphidium adelaidense, E. rotatus.

356-360 feet. Cohrecus sandstone with a few shell fragments.

The unfossiliferous sands at 310-320 feet are Pleistocene in age. The fossiliferous beds from 320 feet down to 360 feet are referred to the upper member of the Adelsidean Stage (Maxlett sandsteps). Typical foraminifers of the (Adelsidean stage are

- Bore No.58. Rellway Station. Hove. W. side of Brighton Road Section 258. Hundred of Moarlungs.
- 208-210 feet. Gream coloured calcareous sandstone with foraminif-
  - Foreminifera. Sismoidella elegantissima, Elphidium adelaidense, E. parri, Operculina victoriensis (common).
- 258-297 feet. Cream to ochreous calcareous sandstone with foreminifera (Operculing, common) and tubes of Ditrume.
  - Foraminifere. Signoldella elegantissime, Discorbia cycloclypeus Rotalia beccarii (r), Crespinella umbonifera, Elphidiwa adelaidense, E. parri.
- 300-511 feet. Greyish calcareous sandstone with foreminifera (Operculius common)
  - Carpenteria proteiformis, Elphidium adelaidense, Amphiategina lessonii, Operculina victoriensia.

The samples from 208 feet down to the base of the bore at 511 feet are Middle Miocene in age and belong to the Balcombian stage. Typical foraminifera such as <u>Operculina victoriensis</u> and <u>Crespinella umbonifers</u> are common.

#### Bore No. 55. Wolseley Flentation. Fort Road. S.W. Boundary of Section 375. Rundred of Yetala.

- 0-585 feet. Coarse to fine unfossiliferous sandstones and grits.
- 385-395 feet. Sandstone, with a few foraminifere and shell fragments.
  - Foreminifere. Merginopore vertebralis.
- 395-435 feet. Grey calcareous sandstone with foraminifera and molluses.
  - Foreminifers. Quinqueloculina ammorbile, Q. vulgaris,
    Triloculina tricarinata, Cribrobulimina polystoma,
    Clavulina difformis, Marginopora vertebralla,
    Peneroplis planatus, Guttulina regina, G. problema,
    Sigmoidella kagaensis, Rotalia beccarii, Discorbis
    cyclociypeus, Notorotalia elathrata, Epistomaria
    polystomelliodes, Elphidium rotatum, R. adelaidense.
- 435-568 feet. Grey calcareous sandstone, with foraminifers and mollusca.
  - Foraminifera. Quinqueloculina disparilia. Q. lamarckiana, Q. seminulum, Massilina lapidigera, Clavulina multicamerata, Marginopora vertebralia, Sorites

marginalis, Dentalina of. oblique, Sigmoidella elegantissima, Rotalia beccarii, Nomion depressulum, Elphidium orispum, E. charmani.

600-620 feet. Ochreous, celcareous sandstone, with foraminifers at numerous tubes of Ditrups.

Foreminifers. Textularia segittula, Marginopora vertebralia,

Guttulina regina, Sigmolde la elegantiasima,

Discorbia evolocivpeus, Notorotalia howchini,

Crespinalia umbonifera, Spistomaria polystomelloidea,

Elphidium adelaidense, E. chapmani, E. parri,

Operculina victoriensia.

The samples from the surface down to 385 feet are unfossiliferous and are from Recent to Fleistocene in age.

The grey, calcareous sandstones from 385 feet down to 568 feet are Lower Pliocene in age represent the characteristic foraminiferal assemblage of the Adelaidean stage.

From 600 feet down to 620 feet the beds belong to the Middle Miocene. (Waklands \* Fermation) \*\* They contain the mixed assemblage of species which is characteristic of the upper part of the Balcombian stage in the Adelaide deposits. The well-known With Balcombian fossil, Ditrups cornes var. wombetiensis and enother variety constricts is very common.

Bore No. 66. Kilkenny Plantation, Fort. Road. S.W. Boundary of Section 587. Eundred of Yatala.

324 feet. Ochreous quartz sand.

331-353 feet. Cream to ochreous calcareous sandstone.

Forminifera. Discorbia dimidiata, D. turbo, Rotalia beccarii.

360-378 feet. Friable quartz sandstone with foreminifers and fragments of molluscs.

Foraminifera. Rotalia beccarii.

388-400 feet. Grey calcareous sandstone with foreminifera.

Foreminifers. Marginopora vertebralis, Rotalia beccarii,
Discorbia evelociyneus, Sinnidium crispum, E.
pseudomodosum.

410-440 feet. Grey calcareous sandstone, with foraminifers and molluscs.

Foreminifera. Cribrobulimina polystoma, Marginopora vertebralis, Discorbis cycloclypeus, Rotalia beccerii, Elphidium

#### adeleidense, E. rotatum.

The sample at 324 feet is referred to the Fleistocene.

From 330 feet down to 440 feet, the bore passed through the fossiliferous beds of the Adelaidean stage. The upper bed of fine sandstone with foraminifera extended from 531 feet down to 376 feet and the lower bed of the typical grey calcareous sandstone from 568 feet down to 440 feet. Characteristic foraminifera of the Adelaidean stage are present but are not common.

#### Bore No.67. Beverley Reserve. N.W. Corner of Reserve. Section 595. Hundred of Yatale.

366-377 feet. Frieble ochreous sandstone. No fossils.

377-391 feet. Friable sandstone with foreminifere and shell fragments.

Foraminifera. Triloculina tricarinata, Reophax scorpiurus var. testacea, Peneroplia planatus.

391-395 feet Hard, grey, calcareous sandstone.

393-402 feet. Friable ochreque condstone with a few foraminifera.

Foreminifera. Rotelia beccarii, Elebidium rotetum.

402-416 feet. Ochreous sandstone with some poorly preserved foreminifers and ostracods.

Foreminifera. Guinquelogulina costata, Trilogulina tricarinata,
Clavulina multicamerata, Marginopora vertebralia,
Discorbia dimidiata, D. evelocivoeus, Rotalia
beccarii, Elphidium erispum.

Ostracoda. Bribocypia tumefacta.

416-445 feet. Grey calcareous sendstone with a few poorly preserved foreminifers and mollusca.

Foreminifere. Quinqueloculine contata, Cribrobulimine polystoma, Rotella beccarii, Discorbia cycloclypeus, Notorotalia clathrata, Elphidium adelaidense.

The samples from 366 feet down to 391 feet are referred to the Pleistocene. Recent species of foreminifers and mollusca are present at 377-591 feet where the pelecypod Anapells is very common.

The Lower Pliocene sandstone is represented from 391 feet down to 443 feet and Adelaidean foraminifers are present. The upper bed of the stage extends from 391 feet down to 616 feet and the lower one from 416 feet down to 443 feet.

#### Eore No. 68, Woodville Plantation, Fort Road. S.W. Bourdery of Section 398, hundred of Yatala.

580-586 feet. White quarts wand.

336-341 feet. Hard, yellowish, calcareous sandstone, with a few molluscan fragments indeterminate.

345 feet. Shelly sendstone.

The samples from 530 feet down to 556 feet are Pleistocene in age. Fereminifers are absent but fragmentary molluscan shells are common at 545 feet.

Bore No.69. Royal Park. Old Port Road.
Plantation Area. centre E. beundery. Section 445. Rundred of Yatala.

501-317 feet. Creem coloured calcareous sandatone, with a few small fragments, and outracode (Loxoconcha australia)

318-325 feet. Gream coloured shelly candstone with foraminifera.

Foreminiters. Suinqueloculine assmophile, Triloculine tricerinets, Spiroloculine excevets, Cribrobulinine
polystome, Clevuline multicemerate, Peneronile
plenetur, Serviceport vertebralis, Notorotalia
clathrete, Rotelle beccapii, Discorble patelliformie,
Elphilims adelaidense, E. rotetum.

525-355 feet. Sendstone containing foreminifers and abundant shells.

Poreminifere. Quinqueloculina associale. Triloculina tricarinata, Cribrobulinica polyptoma, Marginopora vertebraila, Signolicula elegantiacina, Rotalia beccarii, Discorbia cycloclypeus, Elphidium adelaidena

335 feet. (Slown sand). Very fine sand with minute foreminifor

Foreminifers. Discorbis cycloclyceus, Rotalia beccarii, Elphidium crispus.

352-365 feet. Grey shelly sendstone with numerous foreminifers.

Formuniters Quinqueloculine Limbate, Q. bouces, Q. Yulger's, Q. polygons, Q. season is Tiloculine Figures.

Figure Indication of the reads Messilme and Learn Opinional exceptors, Concroning planetus, Sories regules Messilme vertebra.

Volvaline Meviciane, Q. Luges, Criprobulinane polystome (Q. Nubecularia Inclinea vert lepides, Clavulina nul canarate lighteria eleganisates, S. Kagaenale, Guitulia crima, G. Lugise, Q. Mobilere, G. Vabel, Discorpis Cimidiate, D. Creiculfore, G. Vabel, D. Vabel, D. Creiculfore, G. C

Ostracoda: Loxoconche Gustralia, Bythocympia tumefacta:

345-390 feet. (Blown sand). Sand, with small foreminifere, shell fragments and ostracods.

Foraminifera. Rotalia beccarii. Discorbis cyclociypeus. Elphidium scelaidense, E. crispus.

Ostracoda. Cytherella lata, Loxoconcha sustrelia.

The whole of the series of samples from 301 feet down to 390 feet is Lower Pliocene in age, and the sandstones contain the characteristic assemblage of Adelaidean foraminifers. The ostracoda are referable to Recent species.

Bore No. 75. Southwark. E. Corner. Section 353. Hundred of Yatala.

339-357 feet. Pale ochreous to cream coloured sandstone with formunifers.

Foraminifera. Marginopora vertebralia, Discorbia evolociypeus, Eponidea rependus, Elphidium sp.

357-377 feet. Grey to ochreous, calcareous sandstone with a few foreminifers and numerous mollusos.

Foraminifera. Triloculina tricarinata, Marginopora vertebralia,
Peneroplia planatua, Cribrobulimina polyatoma,
Rotalia beccarii, Diacorbia evalcelypeus, B. dimidiata, Elphidium rotatum.

877-396 feet. Calcareous sandstone with some foreminifers and numerous mollusce chiefly fragments.

Foreminifers. Guinqueloculina lamarckiana, G. Ammondila,
Triloculina trigarinata, Spiroloculina resularia,
Cribrobulimina polystoma, Marginopora vertebralia,
Sorites marginalia, Peneroplia planatua, Guttulina
problema G. regina, C. resgularia, Sigmoldella
kamaenaia, S. elegantiasima, Discorbia dimidiata,
D. orbicularia, D. cycloclybena, Rotalia beccarii,
Elphidina rotatum.

All samples from 359 feet down to 357 feet are of Lower Pliocene age. The typical assemblage of Adelaidean foraminifera is present but specimens are not common.

Bors No. 80, M. T. T. Vinduct. Fulham. N.E. Corner. Section 525. Hundred of Adelaide.

344-354 feet. Cream coloured sandstone with a few foreminifera and shell fragments indeterminate.

Foraminifera. Sigmoidella kagaensia, Rotalia beccarii.

- 354-390 feet. Frieble grey sendstone with a few formainifera and mollusca indeterminate.
  - Foreminifera. Cribrobulimine polystoma. Discorbia cycloclypeus, Roistomaria polystomalloides. Roislie becesti.
- 390-479 feet. Grey calcersous sandstone with foreminifera.
  - Signoidale elegantiasime, Cibicides pagerianus, Notorotalia elegantiasime, Cibicides pagerianus, Notorotalia elegantiasime, Solstonoria noivatomalioides, Niphidius adelaidense, N. rotatus.
- 479-465 feet. Gray calcareous sandstone with a few foreminifers, large fragments of Ostree and ostracods.
  - Foreminifers. Guinqueloculins assochile, Clavuline Bultigamerata, Giometdella elementiasima, Sotorotalia alaturata, Discorbia cycloclyneus, Sichidium adelaidense.

Ostracoda, Crtherella lete.

All samples from this bore belong to the Adelsidean stage in which typical foraminifers are recorded. The upper bed of the stage extends from 344 feet down to 345 feet and the lower one with its typical grey calcareous sandstone from 354 feet down to 585 feet.

## N.W. Corner, Section 101. Family of Adelaide.

SLO-36E foot Opit.

573-385 feet Dark grey carbonaceous shale. Se foskile.

365-398 feet Sendstone with foreminifers and shell fragments.

Formulaifere. Quinqueloculine vulgaris, Triloculine tricerinte, Discorbis conjonituens, Rotalis Decempii, Michigium adelpidense.

- 393-445 feet. Croy calcureous sundatone, chiefly hard, with foreminifers and some molluses.
  - Poraminitera. Entropsiocultus summorphita, C. disparille C. polygons, Massiline Isplatigera, Pereronlis planatus, Espritografa veriebralis, Priorobultuins polyatoms, Valvuline fusca, Guttuline problems, Signational kassensin, Pasudo/Poolymorphine despei, Netorotalis clathrets, Elphidium erispum, E. rotatus.
- 445-475 feet. Shelly sandstone, with foreminifers,
  - Forgminifera. Quinqueloculina emporbila. Q. Vuluaria, Guttulina problema, Rotalia becearii, Emistomaria polyatomelloldea, Disporbia dimidiata.

The semples from 510 feet down to 362 feet are referred to the Pleistocene. The cerbonaceous shale at 575-585 feet is

uncommon in the Pleistocene in the bere samples.

The Adeleidean stage of the Lower Pliocene is represented from 585 feet down to 475 feet and the characteristic foreminiferal assemblage of the stage is present. The upper bed occurs from 585 feet down to 592 feet and the lower one from 593 feet down to 475 feet.

Centre, 2, boundary, Section 445, audired of Yatala.

325-347 feet. Yellowish sandstone.

347-349 feet. Green coloured sandstone with foraminifera scarce Poraminifera. Natorotalia clathrata.

349-357 feet. Cream and grey calcareous sandstone with a few shell fragments indeterminate.

390-457 feet. Grey shelly sendstons with foreminifers.

Cribrobulizina polystoma, Zersinopora vertebrelia,
Guttulina problema, Sigmoidella elecantingima,
Discorbia dimidiata, D. cycleel reus, Notorotalia

clatarasa, Robalia beccari, Brandolum adola dense,
E. rotatua.

The rellowish sandstone at 325-347 feet is referred to the Pleistocene. Lower Pliceene fossiliferous sandstones containing the characteristic assemblage of Adelsidean foraminifera occur from 347 feet down to 457 feet. The upper bed of the stage is present from 347 feet down to 357 feet and the rich fossiliferous sandstones of the lower bed from 390-457 feet.

Bore on Hann's Property. Plinders Park. S.W. Corner, Section 592, Hundred of Yatala.

520-407 feet. Frieble, yellowish sandstone with a few foraminifers and shell fragments.

Foreminifere. Rotalia beccarii, Monion depressulum, Elphdium

407-458 feet Grey calcareous sandstone with foreminifers and mollusce.

Foreminifers. Suinqueloculina ismarchiana, Triloculina iricarinata, Engalina apidigera, Valvulina davidiena, Cibrobulimina polystema, Ciavulina multicamerata, Eart nopora vertebralis (common), Sorites marchais, Guttulina problema, Sigmoidella kagaensis, S. Siegantiasima, Rotella beccaril, Discorbis cycloclypaus, D. acervulinoides,

Epistomeria polystomelloides, Notorotalia clathrets, Elphidium adelaidense, E. charmani, E. rotatum, E. cripsum.

458-492 feet. Grey calcareous sandstone with some foraminifera and numerous mollugea.

Foraminifera. Guinqueloculina lamarckiana. G. limbate. G. seminulum, G. disparilis. G. semreibersiana, Triloculina tricarinata. Cribrobulimina polvatoma, Clavulina multicamerata, Vernaullina triquetra, Marginopora vertebralis. Guttulina regima. G. lactes. G. problema. Rotalia beccarii. Discorbis acervulinoides. D. cycloclypeus. D. orbicularis. Enistemaria polyatomalioides. Notorotalia clathrata. Elphidium adelaidense. E. rotatum.

The samples from 320 feet down to 492 feet belong to the Adelaidean stage of the Lower Pliocene. The upper bed of the stage occurs from 320 feet down to 407 feet and the lower one, in which Marginopora vertebralis is common, from 407 feet down to 492 feet.

Bore at Nathan Brewery. Southwark.
N.S. Corner. Section 1. Hundred of Adelaide.

350-364 feet. Ochreous sandstone with a few foraminifera and shell fragments.

Foreminifers. Guinqueloculina vulgaria, Cribrobulimina polystoma, Discorbia cycloclypeus, D. orbigulari s, Elphidium crispus.

364-447 feet. Grey calcareous sandstone with foraminifera.

Foreminifera. Guinqueloculina vulgaria, Triloculina tricarinata Massilina lapidigera, Flintina triquetre, Marginopora vertebralia, Signoidella kagaensia, Guttulina problema, Rotalia beccarii, Discorbia cycloclypeus, D. acervulinoides, Notorotalia clathrata, Epistomaria polystomelloides, Elphidium adelaidense, E. rotatum, E. crispum.

500-509 feet. Hard yellowish bryozosl limestone with forsminifers and Ditrups tubes.

Foreminifers. Earginopors vertebralis, Operculina victoriensis

509-524 feet. Deep cresm coloured sandstone with foreminifers

(Operculina victoriensis common) and tubes of

Ditrups.

Foreminifera. Textularia sagittula, Marginopora vertebralia, Sigmoidella elegantiasima, Sigmomorphina subregularia, Gypsina howchini, Acervulina inhaerena, Baggina philippinensia, Discorbia eveloclypeus, Epistomaria polyatomelloidea, cf. Hofkerina semiornata, Crespinella umbonifera, Elphidium adelaidense, E. chapmani,

#### E. parri, Operculing victoriensis.

530-555 feet. Cream coloured bryozoal limegtone with foraminifera (Operculina victoriensis abundant), and ostracoda.

Poreminifere. Textularia sagittula, Modosaria vertebralia,
Guttulina irregularia, G. problema, G. coatulata,
Sigmoidella elegantissima, Sigmomorphina regularia,
Glandulina laevigata, Cypaina howehini, Baggina
philippinanaia, Enistemaria polyatomelloidea,
Discorbia evelogiypeua, Notorotalia howehini,
Nonion depressulum, N. victorianae, Siphidium parri,
E. chapmani, Operculina victorianaia.

Ostracode. Bairdie ovata, Cythere parellelogramme, C. ef. leprelloides.

From 350 feet down to 447 feet the bore passes through Lower Pliocene fosciliferous sandstones of the Adeleidean stage in which characteristic foreminifers are common. The upper bed of the stage extends from 350 feet down to 364 feet and the lower one from 364 feet down to 447 feet.

At 500 feet the bore passes into Middle Miocene sediments containing the characteristic foraminiferal assemblage of the upper part of the Balcombian stage as developed in the Adelaide area.

#### Bore on A.E. Papa's property. Fulhem Cardens. Section 423. Numbed of Yetals.

365-367 feet. Fine send with small foreminifere.

568-360 feet. Quartz sand and hard, grey calcareous sandstone, with a few foreminifers and small shall fragments.

Poreminifere. Triloculina tricarinata, Marzinopora vertebralia, Discorbia cveloclypeus.

596-405 feet. Grey calcareous sandstone with foreminifera.

Foreminifera. Trilogulina tricarinata, Culnqueloculina

aumophila, Clavulina multicamerata, Cribrobulimina

polystoma, Nubecularia lucifuga var. lanidea,

larginopera vertebralia, Cultulina regina, Sigmoidella elemantissima, Notorotalia elathrata, Discorbia

cycloclypeus, Rotalia beccarii, Elemidium adelaidense
E. charmani.

410 feet. Grey calcareous sandstone, with foraminifera, bryozoa and shell fragments.

Foreminifere, Gribrobulimina polystome, Guttulina problema,
Sigmoidella kagaensis, Discorbis cycloclypeus,
Rotella beccarii.

Ostracoda. Macrocypris tumida.

415-425 feet. Grey calcareous sandatone, with foraminifora, bryosoa and numerous shell fragments.

Foreminifers. Quinqueloculina ammophila, Irlloculina tricarinata, L. polygons, Velvulina davidiana, V. fusca, Flintina triquetra, Sulscularia lucifusa ver lapidea.

Cribrobulimina polystoma, Clavulina multicamerata,
Gaudryina rugosa, Marcinopora vertebralia (c),
Soritos marcinalia, Guttulina regina, G. regina var.
crassicostata, G. problema, Sizmoidella kagaenaia,
Discorbia dyclociyosus, Rotalia beceari, Rotoratalia clathrata, Spistomaria polystomalioides, Siphidium rotatum, E. adelaidense, Chapmani, Crisbum.

Optracoda. Ha grocyoris de cora, Cytherella late.

430-435 feet. Grey calcareous sandstone, with foraminifera scarce, bryozos and shell fragments.

Poraminifera. Suinquelcouline Campophile, Valvuline devidiana, Ciavulina multicamerata, Cribrobulimina polystoma, Facudopolymorphina doanei, Discorbis cycloclymous, Epistomaria polystomelloides, Motorotalia clathrata, Rotalia beccarii, Elphidium rotatum, E. adelaidense.

435-450 feet. Friable shelly limestone, with foraminifera.

Foreminifere. Quinqueloculine vulgaris, Q. polygone, Triloculine tricarinets, Cribrobulimine polyetome, Marginopors veriabralis, Guttuline probleme, Discorbis evelocivos—us, Notorotalia elathrata, Rotalia beccarii, Elphidium acelaidense, E. rotatum, E. charmani.

450-467 feet. Grey calcareous sandstone with foraminifera.

Foreminifera. Cribrobulimina polystoma, Marginopore vertebralia, Sigmoldella kagaenaia. Discorbia evelociypena. Notorotalia elathrata. Rotalia beccarii. Michidium rotatum. Spistomaria polystomelloidea.

Pleistocene sands are present from 365 feet down to 367 feet.

Typical gray fossiliferous bads of the Lower Pliocens ximed to the lower Pliocens ximed to the lower pliocens of the Adelaidean stage are very numerous, Marginopora vertebralis being common at 415-425 feet.

Bore on K.R. Woymouth's Property. West Beach. Section 282, Nundred of Adelaide.

Q - 18 feet. Hard to friable, buff coloured sandstone with foreminifers and a few mollusca.

Foreminifera. Quinqueloculina vulgaria, Rotalia beccarii, Discorbia evelociypeus, D. turbo, D. dimidiata.

320-355 feet. Hard coarse grained calcareous sendstone with small foraminifers.

- 335-340 feet. Friable sandstone with small, poorly preserved shells.
- 340-345 feet. Fine sandstone, with a few small foreminifera.
  - Foreminifere. Rotalia beccarii, Monion depressulum, Elmidium crispum.
- 345-351 feet. Grey sandstone with a few foraminifers and some mollusos.
  - Foreminifera. Trilogulina tricarinata, Guttulina regina, G. problems. Discorbis dimidiatus, Elphidium adelaidense.
- 351-350 feet. Grey sandstone with memorous foraminifere and some mollusca.
  - Foreminifere. Triloculine tricerimete, Valvuline favidiana,

    1. fuses, Cribrobulinina polyetoma (c), Clavulina
    multicamerate, Marcinopore vertebralia, Rotalia
    beccarii, Discorbis cyclociyneus, D. dinidiata,
    Epistomaria polyetomalicides (c), Elphidium crisuum.
- 350-357 feet. Fine sandstone with small foreminifera (Rotalia beccarii).
- 367-370 fest. Hard grey shelly limestone.
- 370-380 feet. Hard to frisble calcareous sandstone with numerous rod-like bodies, cf. algae, few foraminifers, and molluscs.
  - Foreminifera. Cribrobulizine polystome, Marginopore vertebrelis, Discrobis cycloelypeus, D. dimidiate, Rotalia beccari
- 390-397 feet. Orey sandstone with numerous foreminifers.
  - Yulsts Picculte triesrines Siroloculte excevete Marginopore vertebrale Sorites marginalis, Cibrobulinia polystome (c. Velvulna davidare, V. Tusce, Clavulina multicamerate, Gaudryla Tugose, Verneulina triquete Globulina ibbs, Sissoidella kajsenale, S. elegentiasina, Pseudopolymorphina desnal Notorotalia clathrata (c. Discorbia cycloclymeus(c), D. orbicularis, D. dimidiate (c. Rotalia Descaria, c. Siphidiam adelaidance, S. rotatum.
- 397-445 feet. Herd to frisble sandstone with foreminifers not as common as in 590-597 feet, and mollusca especially Catres.
  - Foregrinifere. Marginopore vertebralis, Valvuline devidiane,
    Textularis (ramen, Cribrobulimine polystome,
    Gaudryine rugose, Clevuline multicemente, Pavonine
    flabelliformie, Sigmoidelle Lagaenais, S. Clegantiseime, Guttuline probleme, Globicerinoides trilobus,
    Baggine philippinenais, Octorotalie clathrate,
    Discorbie Cycloclycome, Rotalia beccarii, Claicides
    of, Victorienais (c), Ichidium adelaidense, L.
    rotalum, E. Chargani.

445-450 feet. Fragments of molluson chiefly of Ostron.

The eardstone from the surface down to 18 feet is of Recent age.

\* The Adelaide stage of the Lower Pliocene is represented from the depth of 320 feet down to 450 feet. The calcareous sandstone from 320 feet down to 345 feet belongs to the upper bed of the stage and the grey fossiliferous sandstones from 345 feet down to 450 feet, to the lower one in which numerous foreminifers characteristic of the Adelaidean assemblage are present.

Bore on A.E. Amber's Property Netley.
Near W. boundery, S.W. Corner, Section 105, Hundred of Adeleide

- 271-294 feet. Calcareous sandstone with foraminifera (Operculina victoriensis common), fragments of echinoid spines and bryozos.
  - Foreminifera. Sigmoidella elegantiacima, Sigmomorphina subregularia, Gypsina globulus, Eponides scabriculus, Elphidium adelaidense, Operculina victorienais.
- 294-334 feet. Black carbonaceous shale with fragments of cream
  limestone, foreminifera, poorly preserved mollusca
  end ostracoda.
  - Foraminifere. Pyrgo anomala, friloculina tricerinata, Massilina lapidigera, Pyrgoella sphaera, Guingueloculina lamarokiana, C. schreibersiana, Cormiscira foliacea, Austrotrillina howchimi, Dorothia parri, Textularia sagittula, Marginopora vertebralia, Sigmoidella elegantiasima, Guttulina problema, Cypsina howchimi, Cibicidea
    victoriensia, Elphidium adelaidense, E. chappani,
    Amphisterina lessonii, Operculina victoriensia.
- Ostracoda. Beirdie emvadeloides, Cythere dictyon.

  334-362 feet. Grey bryozoel limestone with foreminifere and

ostrecode.

- Foreminifers. Dentalins oblique, Signomorphine subregularis, Signoidella elegentissima, S. kagaensis, Signonine systrelis, Carpenteria proteiformis, Eponides repandus, Amphistogina lessonii, Operculina victoriensis.
- Ostracoda. Bairdia amygdaloides, Cythere dictyon.
- 562-400 feet. Yellowish limestone with foraminifera, (Operculina abundant) and ostracoda.
  - Foreminifere. Textularia sagittula, Dentalina obliqua, D.
    acluta, Sigmoidella elegantissima, Sigmomorphina
    subregularia, Cypaina howchini, Calcarina verriculata

(c), Eponides scabriculus, Cibicides victoriensis, Crespinella umbonifera, Elphidium sp., E. howchini, E. parri, Operculina victoriensis.

Ostracode. Escrocypris de cora, Cythere flexicostata, Cytherella lata, Xestolebris variegata.

435 feet. Similar to 362-400 feet but with formainifera not so numerous.

Poraminifera. Gaudryina rugosa, Miniacina minutum, Calcarina verriculata (c), Operculina victoriansia (c).

461 feet. Ochreous, bryozoal limestone with foreminifers.

Foreminifera. Pseudoglandulina cometa, Planorbulina mediterranensis, Calcarina verriculate, Operculina victoriensis (c).

The samples from 271 feet down to 461 feet are Middle Miocene in age and belong to the Balcombian stage as developed in the Adelaide erea. The zonal form Austrotrilling howehing occurs at 294-334 feet where it is associated with a typical assemblage of foraminifers including Marginopora vertebralis. Gypsing howehing, Calcaring verriculate, and Operculing victoriensis which is very common. The ostracoda are characteristic of the Balcombian assemblage.

#### Bore on 1.8. Ackland's Property, Glandore. Section 53. Hundred of Adelaide.

87' - 91'6". Hard yellowish calcareous sandstone.

91'6" - 94'6". Yellowish calcareous sandstone with foraminifers.

Foreminifera. Rotalia beccarii, Astronomion australe, Elphidium orianum, E. adelaidense.

96-97 feet. Brownish sandstone with numerous glauconite grains foraminifera, many replaced with glauconite and ostracoda.

Foreminifere. Rotalia beccarii, Discordis eveloclypeus.

Ostracoda. Macrocypria decora.

- 97-162 feet. Hard calcareous sandstone with foreminifers and shell fragments also numerous grains of brown glauconite.
- 155-160 feet. Grey bryozoa sendstone with numerous small foraminifers and ostracods.
  - Foraminifera. Pyrgoella sphaera, Quinqueloculina venusta, Q. polygora, Q. vulgaria, Triloculina tricarinata,

S. cf. miocenics. Simoline Victoriencie,
S. cf. miocenics. Simolinelle obloncs, Ophthalmidium
sp. Corpuspire involvens, G. cf. foliaces, Reophan
scorpiurus ver. testaces, Dorothie parri, Saudryim
[Pseudogaudryima] crespinee, Rolling victoriam,
Buliminella elegantissime, Gasaiduline subclobose,
Regens Farginsts, Oplina heregons, S. globose,
Bentaline emaciate, D. solute, Hodoserie arundines,
Morginuline glabre, Frondiquiarie op., Glanduline
leevigata, Guttuline lectes, S. irregularis, G.
Froblems, Sigmomorphine of Finitatensis, Reudepolymorphine rulls var parri, Rerbornine at Associa,
Spirilline decorate, S. pectinimarginsts, D. australis,
Cibicides refulgens, C. sp. 1, Sponides scabriculus,
Flanuline sp. Abomaline glabrate, A. Frosserugose,
Elphidium cressatum, Elpseudolinistum, Amphistegine
Lessonii.

Ostracoda.

Bairdia subdeltoidea, Magrocypria tumida, Bythobythere arenosa, Cythere dictyon, C. postdeclivis,
C. demissa, Alatacythere precentareticum, Cytherella
runciata, C. lata, Loxoconcha australia.

The samples from 87 feet down to 102 feet are Lower Pliocene in age and are referable to the Adelaidean stage. Glaucon-ite is common from 95 feet down to 102 feet where it replaces many foraminiferal tests. This glauconitic facies is uncommon in the Adelaidean stage.

The bryosoml sandstone from 155 feet down to 160 feet is Middle Miocene in age and belongs to the Janjukian stage.

Typical foraminifers include Massilina torquerensis and Sherbornina atkinsoni. The ostracods are typical of Janjukian assemblages.

Bore on S.A. Ivimey's Property. Warredale.

130-132 feet. Fale yellowish sandstone.

133-170 feet. Cream coloured sandstone with some glauconite and a few minute foreminifers.

Foreminifere. Rotalia beccarii, Monion sp., Elphidium ap.

206-226 feet. Grey marl with glauconite, foraminifere and mollusca.

Foreminifera. Guinqueloeulina vulgaria, Masailina torquayenaia,
Signoilina victorianaia, Dorothia parri, Ecntalina
obliqua. D. soluta. Glandulina laevigata, Guttulina
problema, G. irregularia, Globulina sibba, Signomorphina vaughani, Cibicidea sp. nov., Anomalina
nomionoidea.

226-245 feet. Dark grey marl with glauconite, pyrite a few foraminifere, bryozoa, mollusca and ostracoda.

Foraminifera. Quinqueloculina vulgaria, Cyclamnina ap., Verneullina triquetra, Dentalina subcostata,

Guttulina irregularia, Cibicides lobatulus, C. sp., Angualina nonionoides.

Ostrecode. Cythere scutigere.

245-270 feet. Dark green, glauconitic sandstone with foraminifera and bryozoa.

Foreminifera. Cassidulina subglobosa, Guttulina irregularia, cf.

Carpenteria rotaliformia, Cibicides of. sorrentae,

C. refulgenua, Sherbornina ap., Eponides repandua,

Discorbia globularia.

The samples from 130 feet down to 170 feet are referred to the Fleistocene.

The glauconitic marks and sandstone from 206 feet down to 270 feet are Middle Miocene and represent the lowest part of the Jenjukian stage exposed in the cliffs at Aldinga. Characteristic Jenjukian formminifera include Massilina torquayensis and Sherbornina atkinsoni.

#### Bore No.1. A.H. Kentish's Property. Direk. Section 3078. Hundred of Kunno Pare.

- 140-200 feet. Ochreous to yellow, fine to coarse grained eardstone.
- 200-240 feet. Sandstone consisting of fine angular and coarse, rounded to angular quartz grains and carbonaceous material.
- 240-250 feet. Fine shelly sandstone consisting almost entirely of fragments of pelecypoda indeterminate with a few worn formanifere.

Foraminifere. Rotalia beccarii. Blobidium adelaidense.

- 280-318 feet. Grey fossiliferous sandstone with numerous forestinifera, corele, tubes of <u>Ditrupa</u>, a few bryosos and ostracoda.
  - Foreminifers. Quinqueloculine ammorbile. Q. seminilum, Q. polygone. Q. adelsidensis, Triloculine tricarinate, Schlumbergerine sp. Spiroloculine antiliarum, Austrotrilline howebini (common), Clavuline multicamerete, Marginopora vertebralis, Sorites marginels. Simmomorphine aubregularis, Sirmolocile clegantissime, Discorbis cyclociyneus, Eotalia beccarii. (r), Enistemaria polystomelloides, Gynsine howebini, Crespinella umbonitera (c. simidium parri, E. adelaidense, Operculine victoriensis (c).

#### Ostracoda. Cytherdopteron batesfordiense, Cytherella lata.

Unfossiliferous sandstones of Pleistocene age extend from 140 feet down to 240 feet. The fine grained shelly sandstone from 240 feet down to 260 feet is Lower Pliocene and represents the upper bed of the Adelaidean stage.

The fossiliferous sandstone at 280-308 feet is Middle
Miocene and belongs to the Balcombian stage as developed in the
Adelaide area. Typical Balcombian foraminifera such as
Austrotrillina howchini, Crespinella umbonifera and Operculina
victoriensis occur in some abundance together with species such
as Marginopora vertebralis, Epistomaria polystomelloides and
Elphidium adelaidense which become prominent in the overlying
Adelaidean stage. The well-known Balcombian ostracoda Cytheropterom
batesfordiense is also present

#### Bore No. 2. A.H. Kentish's Property. Direk, Section 3076, Hundred of Munno Para.

- 150-180 feet. Yellowish sandstone
- 180-210 feet. Sandstone composed of small angular quartz grains and carbonaceous material.
- 210-265 feet. Sandstone composed of small angular quartz grains and carbonaceous material with a few small rotaline foraminifera, too decomposed for determination.
- 265-300 feet. Shelly limestone with foraminifera rather worn.
  - Foraminifera. Quinqueloculina ammophila, Q. vulgaris, Q.

    lamarckiana, Austrotrillina howchini, Triloculina
    tricarinata, Dorothia parri, Marginopora vertebralis,
    Sorites marginalis, Sigmoidella elegantissima,
    Guttulina regina, Discorbis cycloclypeus, Gypsina
    howchini, Crespinella umbonifera, Operculina
    victoriensis.
- 320-345 feet. Dark grey, carbonaceous marl, with a few foraminifers and some worn bryozoa.
  - Foraminifera. Quinqueloculina ammophila, Q. vulgaris, Q. schreibersiana, Austrotrillina howchini, Marginopora vertebralis, Guttulina (Sigmoidina) silvertrii, Sigmomorphina sp., Discorbis cycloclypeus, Elphidium chapmani, E. adelaidense.
- 345-365 feet. Greyish limestone with numerous glauconite grains, also foraminifera, a few bryozoa and ostracoda.
  - Foraminifere. Quinqueloculina vulgaris, Austrotrillina howchini

Textularia sagittula, Sarginopora vertebralia, Sorites Derginalia, Signoidella elegantiasida.
Signomorphima subrequieria, Regina philiprinensia, Eponidea scabriculua, Epistemeria polyatorelloidea.
Erosina bowchini, Crespinella unbomifera, Ampaisterica leasopii, Crespina victoriensia. Eonion victoriensia.

Ostracoda. Cythere postdeclivis, Cytherenteron batesfordiense.

The unfossiliferous andstones from 150 feet down to 255 feet are referred to the Fleistocene.

At 255 feet the bore passes into Middle Miocone sediments which persist until the bottom of the bore at 365 feet. The typical assemblage of Balcombian foraminifers is present, the zonal species Austrotrilling howehing being common.

(Irene Crespin)

Cormonwealth Palacontologist.

CAMBERRA. 4th Japuary, 1949.