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

by

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Samples from 37 bores were submitted by the Director of Mines, Adelaide, 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. C. 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 travertines 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 Pleist-

ocene 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 Agelaide Basin they overlie Middle Miocene sediments at much shallower depths.

Lower Pliocene

Adelaidean Stage

Underlying these Pleistocene sandstones in the central portion of the area are calcareous sandstones of Lower Pliocene age which contain a foraminiferal assemblage characteristic of the Agelaidean stage. The outstanding feature of these bores which penetrated the Adelaidean is the uniformity of sedimentation 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 Marginopora vertebralis, Cribrobulimina polystoma, Flinting intermedia, Flintina triquetra, Valvulina davidiana, V.fusca, Discorbis cycloclypeus, Elphidium rotatum and E.adelaidense.

Middle Miocene.

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 foraminiferal assemblage has been found in the vicinity of Adelaide or in the area south at Aldinga. However, ext 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 Marginopora vertebralis, Epistomaria polystomelloides, Discorbis cycloclypeus 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 Oaklands railway station south of Adelaide.

b. Janjukian stage.

Four bores penetrated the marls and sandy marls 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 Massilina torquayensis and Sherbornina atkinsoni 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. Discorbis 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, Underdale.

In Waterworks Depot at S.W. End of Bridge, Section 97, Hundred of Adelaide.

420-425 feet. Ochreous sandstone with foraminifera and molluscan fragments.

Foraminifera. Guttulina problema, Rotalia beccarii, Elphidium crispum, E. rotatum.

427-438 feet. Hard to friable, grey clacareous sandstone with foraminifera.

Foraminifera. Quinqueloculina vulgaris, Triloculina tricarinata, Marginopora vertebralis, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. crispum.

438-480 feet. Friable sandstone with foraminifera and a few mollusca.

Foraminifera. Quinqueloculina costata, Q. schreibersianna, Q. polygona, Q. ammophila, Massilina lapidigera, u/ Cribrobimina polystoma, Clavulina multicamerata, Marginopora vertebralis, Sorites marginalis, Guttulina problema, Discorbis dimidiata, D. cycloclypeus, Notorotalia clathrata, Rotalia beccarii, Elphidium adelaidense.

486-490 feet. Calcareous sandstone with numerous mollusca.

The samples from 420 feet down to 490 feet belong to the Adelaidean stage and contain numerous characteristic foraminifera. 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. Ochreous sand with a few worn foraminifera.

Foraminifera. Rotalia beccarii, Discorbis cycloclypeus.

393-440 feet. Grey shelly sandstone with a few foraminifera.

Foraminifera. Quinqueloculina ammophila, Q. limbata, Q.vulgaris, Cribrobulimina polystoma, Delosina sp., Guttulina regina, Discorbis cycloclypeus, D. australis, Notorotalia clathrata, Rotalia beccarii, Epistomaria polystomelloides, Peneroplis planatus, Sorites marginalis, Elphidium adelaidense, E. argenteum, E. crispum.

All samples are inthe ~~Kalkstt xxxxxxxxx~~ Adelaidean stage, 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, Fulham.

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 beccarii, 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.

Foraminifera. Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Gaudryina rugosa, Verneuilina triquetra, Marginopora vertebralis, Discorbis cycloclypeus, D. acervulinoides, Epistomaria polystomelloides, Rotalia beccarii.

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

Foraminifera. Quinqueloculina ammophila, Q. polygona, Q. disparilis, Q.vulgaris, Q.seminulum, Triloculina tricarinata, Spiroloculina excavata, Flintina triquetra, Massilina lapidigera, Valvulina davidiana, Cribrobulimina polystoma, Nubecularia lucifuga var. lapidea, Clavulina difformis, Gaudryina cf. rugosa, Marginopora vertebralis, Peneroplis planatus, Pseudopolymorphina doanei, Sigmoidella elegyantissima, S. kagaensis, Guttulina yabei, G. problema, G. regina, Orbulina universa, Cibicides ungerianus, Notorotalia clathrata, Econides repandus, Discorbis orbicularis, D.cycloclypeus, Rotalia beccarii, Epistomaria polystomelloides, Elphidium adelaidense, E.parri, E.crispum, E. rotatum.

475-487 feet. Fine grained, friable, calcareous sandstone with foraminifera and mollusca.

Foraminifera. Quinqueloculina ammophila, Q.limbata, Q. seminulum, Cribrobulimina polystoma, Guttulina problema, Rotalia beccarii, Discorbis cycloclypeus, Cibicides ungerianus, Notorotalia 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 stages, the lithology from 340 feet down to 389 feet exhibiting a slight change in facies. The foraminiferal assemblage is typical of the Adelaidean stage.

Bore No. 85, 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 ostracoda.

Foraminifera. Textularia fistulosa, Dorothia parri, Sigmoidella elegantissima, Sigmomorphina subregularis, Calcarina verriculata, Discorbis cycloclypeus, D. australis, Cibicides victoriensis, Notorotalia howchini, Rotalia beccarii, (r), Sherbornina atkinsoni, Operculina victoriensis, Amphistegina sp.

Ostracoda. Cythere postdeclivis.

160-200 feet. Ochreous, calcareous sandstone.

Foraminifera. Guttulina (Sigmoidina) silvestrii, Amonalina nonionoides, Sherbornina atkingoni, Calcarina verriculata, Eponides scabriculus, Amphistegina lessonii.

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

Foraminifera. Quinqueloculina vulgaris, Q. polygona, Massilina torquayensis, Sigmoilina victoriensis, Cornuspira involvens, Reusella cf. ensiformis, Guttulina irregularis, Pseudopolymorphina rutila var. parri, Sigmomorphina vaughani, Sherbornina atkinsoni, Calcarina verriculata, Eponides scabriculus, Carpenteria rotaliformis, Nonion victoriensis, Amphistegina lessonii.

Ostracoda. Bairdia amygdaloides, Bythocypris tumefacta.

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 Massilina torquayensis and Sherbornina atkinsoni are present.

Bore No. 27.A, Orange Road, Welland.

S. boundary, Section 389, Hundred of Yatala.

375-390 feet. Ochreous sandstone.

390-393 feet. Hard shelly sandstone with foraminifera.

Foraminifera. Guttulina lactea, Discorbis cycloclypeus, Rotalia beccarii, Elphidium rotatum.

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

Foraminifera. Quinqueloculina ammophila, Triloculina tricarinata, Marginopora vertebralis, Sorites marginalis, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. rotatum.

410 feet. Friable shelly sandstone with foraminifera and ostracoda.

Foraminifera. Marginopora vertebralis, Peneroplis planatus, Discorbis cycloclypeus, Elphidium rotatum.

Ostracoda. Loxoconcha australis.

Unfossiliferous Pleistocene sandstones are present at 375-390 feet. The bore passes into the fossiliferous beds of the Adelaide/an 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. Ochreous to whitish sandstone.

360-370 feet. Coarse, reddish, shelly sandstone with foraminifera.

Foraminifera. Marginopora vertebralis, Clavulina multicamerata, Sigmoidella elegantissima, Discorbis cycloclypeus, D. dimidiata, Rotalia beccarii, Elphidium adelaidense.

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

Foraminifera. Pyrgo bulloides, Quinqueloculina disparilis, Q. polygona, Q. lamarckiana, Q. ammophila, Massilina lapidigera, Triloculina tricarinata, Flintina triquetra, Spiroloculina antillarum, Valvulina davidiana, V. fusca, Nubecularia lucifuga var. lapidea, Cribrobulimina polystoma, Clavulina multicamerata, Marginopora vertebralis (c), Sorites marginalis, Peneroplis planatus, Sigmoidella elegantissima, S. kagaensis, Guttulina problema, G. regina, Pseudopolymorphina doanei, Discorbis cycloclypeus, D. dimidiata, D. orbicularis, Epistomaria polystomelloides, Rotalia

beccarii, Elphidium adelaidense, E. crispum.

385 feet. Calcareous sandstone with foraminifera and a few molluscs.

Foraminifera. Quinqueloculina ammophila, Q. disparilis, Q.polygona, Massilina lapidigera, Triloculina tricarinata, Flintina triquetra, Spiroloculina excavata, Clavulina difformis, Cribrobulimina polystoma, Nubecularia lucifuga var. lapidea, Marginopora vertebralis, Peneroplis planatus, Soritea marginalis, Sigmoidella elegantissima, Notorotalia clathrata, Rotalia beccarii, Epistomaria polystomelloides, Discorbis dimidiata, D.cycloclypeus, Elphidium parri, E. rotatum.

390 feet. Hard, shelly limestone with Marginopora vertebralis.

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, Marginopora vertebralis 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 calcareous sandstone with foraminifera.

Foraminifera. Frondicularia lorifera, Guttulina lactea, G. (Sigmoidina) silvestrii, Cancris ovatus, Discorbis australis, Patellinella sp., Gypsina howchini, Planorbulinella plana, P. inaequilateralis, Sherbornina sp. nov., Calcarina verriculata, Rotalia beccarii (r), Eponides scabriculus, Miniacina minuta, Astrononion australe, Nonion sp., Elphidium pseudoinflatum, E. crespinae, Operculina victoriensis.

196-200 feet. Ditto, with foraminifera.

Foraminifera. Sigmoidella elegantissima, Sherbornina sp. nov., Planorbulinella inaequilateralis, 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, Hundred of Adelaide.

212-229 feet. Whitish to yellowish sandstone. No fossils.

229-250 feet. Whitish to yellowish sandstone with a few foraminifera.

Foraminifera. Cribrobulimina polystoma, Clavulina multicamerata, Discorbis cycloclypeus, Rotalia beccarii, Epistomaria polystomelloides, Elphidium crispum.

250-272 feet. Grey calcareous sandstone with foraminifera and mollusca.

Foraminifera. Pyrgo bulloides, Quinqueloculina ammophila, Q.disparilis, Q. vulgaris, Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Marginopora vertebralis, Sorites marginalis, Sigmoidella elegantissima, 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 Adelaide.

329-378 feet. Friable sandstone. No fossils.

378-409 feet. Calcareous sandstone with numerous foraminifera.

Foraminifera. Quinqueloculina vulgaris, Triloculina tricarinata, Reophax scorpiurus var. testacea, Clavulina multicamerata, Cribrobulimina polystoma, Valvulina fusca, V. davidiana, Sorites marginalis, Marginopora vertebralis, Guttulina problema, G. regina, Pyrulina sp., Pseudopolymorphina doanei, Sigmoidella elegantissima, Discorbis cycloclypeus, D.dimidiata, Rotalia beccarii, Epistomaria polystomelloides, Elphidium crispum, E. adelaidense, E. argenteum.

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

Foraminifera. Pyrgo anomala, Quinqueloculina ammophila, Q.lamarckiana, Q. costata, Q. vulgaris, Q.seminulum, Massilina lapidigera, Cribrobulimina polystoma, Marginopora vertebralis, Sorites

marginalis, Peneroplis planatus, Guttulina irregularis, G. problema, G.rabei, Pseudopolymorphina sp., Discorbis dimidiata, Rotalia beccarii, Cibicides ungerianus, Notorotallia clathrata, Elphidium argenteum, E. parri.

The unfossiliferous sandstone from 329 feet down to 370 feet are referred to the Pleistocene. The fossiliferous beds from 378 feet down to 480 feet are Lower Pliocene and contain numerous foraminifera typical of the Adelaidean stage.

Bore No. 56, Railway Station, Oaklands.

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

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

Foraminifera. Reophax sp., Dentalina obliqua, D. soluta, Sigmoidella elegantissima, Siphonina australis, Cibicides victoriensis, Rotalia beccarii (r), Astrononion australe, Elphidium argenteum, E. adelaidense, E. parri.

Ostracoda. Cythere flexicostata.

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

Foraminifera. Marginopora vertebralis, Austrotrillina howchini (common), Operculina 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, Nonion depressulus, Elphidium parri, E. adelaidense, Amphistegina lessonii, Operculina victoriensis.

Ostracoda. Cythere dictyon, Cytheropteron batesfordiense.

226-260 feet. Bryozoal limestone, with glauconite grains very common, also foraminifera, corals, bryozoa poorly preserved and ostracoda.

Foraminifera. Quinqueloculina vulgaris, Q. lamarckiana, Q. ammophila, Triloculina tricarinata, Austrotrillina howchini, Marginopora vertebralis, Dorothia parri, Sigmoilina victoriensis, Sigmoidella elegantissima, Guttulina regina, Globulina gibba, Discorbis cycloclypeus, Cibicides victoriensis, Carrenteria proteiformis, Amphistegina lessonii, Elphidium parri, E. adelaidence, E. chapmani.

Ostracoda. Cythere postdeclivis, Cytheropteron batesfordiense.

260-270 feet. Cream coloured limestone, with fossils almost completely altered.

Foraminifera. Gypsina howchini, Elphidium chapmani, E. sp., Operculina victoriensis.

270-310 feet. Dark grey calcareous sandstone, with numerous foraminifera.

Foraminifera. Triloculina tricarinata, Sigmoilina victoriensis, Cornuspira involvens, Dorothia parri, Liebusella antipodum, Gaudryina collinsi, Cassidulina subglobosa, Triforina bradyi, Lagena apiculata, Dentalina soluta, Frondicularia lorifera, Guttulina lactea, G. irregularis, G. (Sigmoidina) silvestrii, Pseudopolymorphina rutila var. parri, Sherbornina atkinsoni, Spirillina decorata, Eponides scabriculus, Cibicides victoriensis, C. sp. 2, Anomalina nonionoides, A. glabrata, Planorbulina mediterranensis, Elphidium parri, E. crassatum.

310-350 feet. Cream coloured, calcareous, sandstone with foraminifera and Ditrupa tubes.

Foraminifera. Textularia sagittula, Clavulinoides szaboi var. victoriensis, Dentalina obliqua, Sigmoidella elegantissima, S. kaggensis, Sigmomorphina subregularis, Guttulina (Sigmoidina) silvestrii, G. regina, var. crassicostata, Sherbornina atkinsoni, Carpenteria rotaliformis, Miniacina minuta, Calcarina verriculata (c), Cibicides victoriensis, Gypsina howchini, Sherbornina sp. nov., Discorbis balcombensis, Crespinella umbonifera (c), Astrononion australe, Elphidium adelaidense, E. parri, Operculina victoriensis (c).

Ostracoda. Cythere postdeclivis.

380-400 feet. Yellowish calcareous sandstone, with numerous grains of brown glauconite, foraminifera and poorly preserved bryozoa.

Foraminifera. Dorothia parri, Clavulinoides szaboi var. victoriensis, Sigmoidella elegantissima, Sherbornina sp. nov. S. atkinsoni, Discorbis bertheloti var. papillata, Carpenteria rotaliformis, Calcarina verriculata, Cibicides victoriensis, Eponides scabriculus, Crespinella umbonifera, Elphidium parri.

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

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

Balcombian stage. The upper zone of the stage is represented from 218 feet down to 270 feet, the zonal foraminiferal species *Austrotrillina howchini* being common. The lower zone occurs from 270 feet down to 400 feet, in which the zonal species *Crespinella umbonifera* is prominent.

Bore No.37, West Beach Road, Frogmore

N.W. corner of intersection Tapley's Hill and West Beach Roads, Section 217, Hundred of Adelaide

341 feet. Fine angular to rounded, quartz grains. No fossils.

343-362 feet. Quartz sand with foraminifera including large tests of *Rotalia beccarii*.

Foraminifera. *Textularia* sp., *Reussella* sp., *Cribrobulimina polystoma*, *Discorbis cycloclypeus*, *D. patelliformis*, *Nonion* sp., *Elphidium crispum*, *E. argenteum*.

374-394 feet. Pale grey calcareous sandstone with numerous foraminifera, chiefly worn and broken, and a few molluscan fragments and ostracoda.

Foraminifera. *Quinqueloculina costata*, *Triloculina tricarinata*, *Cribrobulimina polystoma*, *Clavulina multicamerata*, *Marginopora vertebralis*, *Sorites marginalis*, *Anomalina* cf. *polymorpha*, *Discorbis cycloclypeus*, *Rotalia beccarii* (very common), *Discorbinella biconcava*, *Elphidium adelaidense*.

Ostracoda.- *Macrocypris tumida*, *Loxoconcha australis*.

404-414 feet. Grey calcareous sandstone with foraminifera (*Marginopora vertebralis* common), shell fragments and fish otoliths, all worn and broken.

424-450 feet. Calcareous sandstone with foraminifera (*Marginopora* scarce), bryozoa, abundant molluscan fragments and ostracoda.

Foraminifera. *Quinqueloculina ammophila*, *Q. polygona*, *Q. lamarckiana*, *Triloculina tricarinata*, *Clavulina difformis*, *C. multicamerata*, *Cribrobulimina polystoma*, *Marginopora vertebralis*, *Sigmoidella kagaensis*, *S. elegantissima* *Guttulina problema*, *Notorotalia clathrata*, *Rotalia beccarii*, *Elphidium parri*, *E. adelaidense*.

Bryozoa. *Tubucellaria cereoides*.

Ostracoda. *Cytherella lata*.

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

Foraminifera. Triloculina tricarinata, Sigmoilina australis, Cribrobulimina polystoma, Clavulina multicamerata, Textularia abbreviata, Lagena hexagona, Dentalina cf. obliqua, Guttulina problema, Baggina philippinensis, Discorbis australis, D. cyclo-clypeus, Rotalia beccarii, Cibicides ungerianus C. cf. victoriensis, Notorotalia clathrata, Elphidium adelaidense, E. crispum, E. parri.

Ostracoda. Macrocyoris decora, Bairdia subdeltoidea, Loxoconcha australis, Cytheropteron sp.

The sample at 341 feet is Pleistocene in age. The fossiliferous sandstone from 343 feet down to 460 feet contains numerous broken tests of Adelaidean foraminifera.

Bore No.38, Torrensville
N. boundary, Section 94, Hundred of Adelaide.

380-390 feet Quartz sand.

390-406 feet Calcareous sandstone.

410-426 feet Hard to friable, grey calcareous sandstone with a few foraminifera and molluscs.

Foraminifera. Triloculina tricarinata, Cribrobulimina polystoma, Rotalia beccarii, Elphidium adelaidense, E. rotatum.

426-440 feet. Shelly sandstone with foraminifera.

Foraminifera. Quinqueloculina vulgaris, Cribrobulimina polystoma, Rotalia beccarii, Elphidium adelaidense.

The quartz sand from 380 feet down to 390 feet is Pleistocene in age. The characteristic deposits of Adelaidean Stage (the Hallett sandstone) extend from 390 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 440 feet. Typical Adelaidean forsminifera are present.

Bore No.39, Flinders Park.
N.W. Corner, Section 391, Hundred of Yatala.

360-403 feet. Fine quartz sand with grains chiefly rounded.

403-406 feet. Yellowish calcareous sandstone, with foraminifera.

Foraminifera. Rotalia beccarii.

406-425 feet. Greyish sandstone with foraminifera.

Foraminifera. Quinqueloculina ammophila, Triloculina tricarinata, Marginopora vertebralis, Sigmoidella elegantissima, Rotalia beccarii, Elphidium adelaidense.

425-465 feet Grey calcareous sandstone, with foraminifera.

Foraminifera. Quinqueloculina boueana, Cribrobulimina polystoma, Clavulina multicamerata, Sigmoidella elegantissima, Guttulina problema, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense.

Unfossiliferous Pleistocene sands occur from 360 feet down to 403 feet. Lower Pliocene fossiliferous 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 403 feet down 406 feet and the lower one of coarse grey sandstone from 406 feet down to 456 feet.

Bore 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.

384-400 feet. Hard calcareous sandstone with Marginopora.

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

Foraminifera. Quinqueloculina asmophila, Q. lamarckiana, Q. vulgaris, Pyrgo elongata, Triloculina tricarinata Marginopora vertebralis, Cribrobulimina polystoma, Valvulina fusca, Clavulina multicamerata, Guttulina problema, Sigmoidella kagaensis, S. elegantissima, Notorotalia clathrata, Discorbis cycloclypeus, Rotalia beccarii, Elphidium crispum, E. adelaidense, E. cf. macellum.

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

Foraminifera. Quinqueloculina asmophila, Q. lamarckiana, Q. vulgaris, Q. disparilis, Q. polygona, Q. schreiberaiana, Triloculina tricarinata, Massilina lapidigera, Spiroloculina excavata, S. regularis, Cribrobulimina polystoma, Valvulina fusca, Clavulina multicamerata, Listerella communis, Marginopora vertebralis, Globulina gibba, Guttulina regina, G. regina var. crassicostata, Sigmoidella kagaensis, Discorbis australis, D. orbicularis, D. cycloclypeus, Rotalia beccarii, Epistomaria polystomelloides, Notorotalia clathrata, Elphidium adelaidense, E. crispum.

Pleistocene sandstones occur from 355 feet down to 383 feet. Lower Pliocene calcareous sandstones are present from 384 feet down to 475 feet and contain a rich and characteristic assemblage of Adelaidean foraminifera.

Bore No.41, St. James Park.
S.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, Peneroplis planatus, Marginopora vertebralis, Discorbis dimidiata, D. cycloclypeus.

386 feet. — Grey, calcareous sandstone, with foraminifera and poorly preserved molluscan shells.

Foraminifera. Quinqueloculina vulgaris, Triloculina tricarinata, Nubecularia lucifuga var. lapidea, Marginopora vertebralis, Guttulina problema, Sigmoidella kagaensis, Discorbis cycloclypeus, Elphidium adelaidense.

405 feet. — Grey, calcareous sandstone, with foraminifera.

Foraminifera. Quinqueloculina ammophila, Massilina lapidigera, Q. boueana, Valvulina davidiana, Cribrobulimina polystoma, Peneroplis planatus, Sorites marginalis, Marginopora vertebralis, (common and large), Sigmoidella elegantissima, Discorbis cycloclypeus, D. dimidiata, Notorotalia clathrata, Epistomaria polystomelloides, Elphidium adelaidense.

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

Foraminifera. Triloculina tricarinata, Nubecularia lucifuga var. lapidea, Cribrobulimina polystoma, Valvulina davidiana, V. fusca, Marginopora vertebralis, Sigmoidella kagaensis, Epistomaria polystomelloides Rotalia beccarii, Discorbis cycloclypeus, D. dimidiata, Elphidium adelaidense.

424 feet. — Friable, grey, calcareous sandstone, with numerous foraminifera.

Foraminifera. Quinqueloculina boueana, Sigmoilina australis, Miliolinella oblonga, M. bucculenta, Triloculina tricarinata, Spiroloculina excavata, Valvulina davidiana, V. fusca, Sorites marginalis, Marginopora vertebralis, Peneroplis planatus, Reophax scorpiurus var. testacea, Clavulina multicamerata, Cribrobulimina 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 foraminifera are present at 340 feet. Lower Pliocene calcareous sandstones occur from 384 feet down to 424 feet and contain numerous Adelaidean foraminifera. Tests of

Reginopora vertebralis 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. Quartz sand. No fossils.

120 feet. Ochreous calcareous sandstone with poorly preserved foraminifera and bryozoa.

Foraminifera. Quinqueloculina sp., Discorbis sp., Eponides sp

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

124-133 feet. Fine angular quartz sand with foraminifera, sponge spicules, and bryozoa.

Foraminifera. Sherbornina atkinsoni, Pullenia quinqueloba, Cibicides ungerianus, Anomalina nonionoides, Discorbis bertheloti, Gypsina globulus, Calcarina verriculata, Amphistegina lessonii.

Spongida. Reiomema newberyi.

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

Foraminifera. Quinqueloculina vulgaris, Dorothia parri, Calcarina verriculata, Crespinella umbonifera, Amphistegina lessonii.

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

Foraminifera. Quinqueloculina vulgaris, Q. seminulum, Sigmoilina victoriensis, Massilina torquayensis, Cassidulina subglobosa, Sigmoidella elegantissima, Sherbornina atkinsoni, Cibicides ungerianus, C. refulgens, C. victoriensis, C. sp. 2, Discorbis orbicularis, D. cyclocyprus, Anomalina grosserugosa, A. nonionoides, Notorotalia howchini, Eponides scabriculus, Nonion umbilicatula, Crespinella umbonifera, Amphistegina lessonii.

174-240 feet. (1) Grey sandstone with glauconite grains and foraminifera.

Foraminifera. Pyrgo bulloides, Quinqueloculina vulgaris, Massilina torquayensis, Triloculina tricarinata, Sigmoilina victoriensis, Gaudryina rugosa, Lagena laevis, Dentalina obliqua, D. soluta, Lenticulina articulata, Globulina gibba, Guttulina problema, G. lactea, G. irregularis, Discorbis balcombensis, Sherbornina atkinsoni, Eponides scabriculus, Cibicides sp. 1, Anomalina grosserugosa, Amphistegina lessonii.

(2) and (3). Greyish sandstone with foraminifera, a few bryozoa, and broken mollusca.

Foraminifera. Quinqueloculina vulgaris, Q. lamarckiana, Triloculina tricarinata, Massilina torquayensis, Sigmoilina victoriensis, Buliminella apiculata, Cassidulina subglobosa, Reophax scorpiurus var. testacea, Dentalina soluta, Globulina gibba, Guttulina (Sigmoidina) silvestrii, Anomalina glabrata, Sherbornina atkinsoni, Eponides scabriculus, E. repandus, Cibicides sp. 2, Planorbulinella plana.

(3). Fine sandstone with numerous foraminifera.

Foraminifera. Pyrgo anomala, P. bulloides, Quinqueloculina agglutinans, Q. costata, Q. seminulum, Q. cf. reeta, Q. polygona, Q. schreibersiana, Q. venusta, Q. vulgaris, Triloculina tricarinata, Sigmoilina victoriensis, Spiroloculina canaliculata, Massilina torquayensis, Cornuspira involvens, Dorothia parri, Leibusella antipodum, Textularia sinhonifera, Buliminella apiculata, Bolivinella folia, Reussella, sp., Cassidulina subglobosa, Oolina fevospunctata, Dentalina cf. spirostriolata, D. fissicostata, D. consobrina, D. soluta, Lenticulina sp. Frondicularia lorifera, Glandulina laevigata, Pseudopolymorphina rutila var. parri, Guttulina irregularis, G. lactea, G. (Sigmoidina) silvestrii, G. problema, Globulina gibba, Sigmomorphina cf. wynwardensis, S. cf. vaughani, S. regularis, Spirillina tuberculata, Cymbaina globulus, Sherbornina atkinsoni, Eponides scabriculus, E. repandus, Dyocibicides biserialis, Calcarina verriculata, Elphidium howchini, 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 Miocene and belong to the Janjukian stage such as is developed at Aldinga. Typical foraminifera, Massilina torquayensis and Sherbornina atkinsoni are present.

Bore No.56. Woodville Oval.
N. end of Oval. Section 403. Hundred of Yatala.

310-320 feet. Angular to rounded quartz grains.

320-356 feet. Ochreous sandstone with foraminifera and molluscs.

Foraminifera. Triloculina tricarinata, Marginopora vertebralis, Rubecularia lucifuga var. lapidea, Discorbis dimidiata, D. cycloclypeus, Rotalia beccarii, Elphidium adelaidense, E. roistum.

356-360 feet. Ochreous 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 Adelaidean Stage (Hallett sandstone). Typical foraminifera of the (Adelaidean) stage are present.

Bore No.58, Railway Station, Hove.
W. side of Brighton Road, Section 258, Hundred of Noarlunga.

208-210 feet. Cream coloured calcareous sandstone with foraminifera.

Foraminifera. Sigmoidella elegantissima, Elphidium adelaidense, E. parri, Operculina victoriensis (common).

238-297 feet. Cream to ochreous calcareous sandstone with foraminifera (Operculina, common) and tubes of Ditrupa.

Foraminifera. Sigmoidella elegantissima, Discorbis cycloclypeus, Rotalia beccarii (r), Crespinella umbonifera, Elphidium adelaidense, E. parri.

300-311 feet. Greyish calcareous sandstone with foraminifera (Operculina common)

Foraminifera. Sigmomorphina subreniformis, Rotalia beccarii, Carpenteria proteiformis, Elphidium adelaidense, Amphistegina lessonii, Operculina victoriensis.

The samples from 208 feet down to the base of the bore at 311 feet are Middle Miocene in age and belong to the Balcombian stage. Typical foraminifera such as Operculina victoriensis and Crespinella umbonifera are common.

Bore No.55, Wolseley Plantation, Port Road.
S.W. Boundary of Section 375, Hundred of Yatala.

0-385 feet. Coarse to fine unfossiliferous sandstones and grits.

385-395 feet. Sandstone, with a few foraminifera and shell fragments.

Foraminifera. Marginopora vertebralis.

395-435 feet. Grey calcareous sandstone with foraminifera and molluscs.

Foraminifera. Quinqueloculina asmophila, Q. vulgaris, Triloculina tricarinata, Cribrobulimina polystoma, Clavulina difformis, Marginopora vertebralis, Peneroplis planatus, Guttulina regina, G. problema, Sigmoidella kagaensis, Rotalia beccarii, Discorbis cycloclypeus, Notorotalia clathrata, Epistomaria polystomelloides, Elphidium rotatum, E. adelaidense.

435-568 feet. Grey calcareous sandstone, with foraminifera and molluscs.

Foraminifera. Quinqueloculina disparilis, Q. lamarckiana, Q. seminulum, Massilina lapidigera, Clavulina multicamerata, Marginopora vertebralis, Sorites

marginalis, Dentalina cf. obliqua, Sigmoidella elegantissima, Rotalia beccarii, Nonion depressulum, Elphidium crispum, E. charmani.

600-620 feet. Ochreous, calcareous sandstone, with foraminifera an numerous tubes of Ditrupa.

Foraminifera. Textularia agglutinata, Marginopora vertebralis, Cuttulina regina, Sigmoidella elegantissima, Discorbis cycloclypeus, Notorotalia howchini, Crespinella umbonifera, Epistomaria polystomelloides, Elphidium adelaidense, E. charmani, E. perri, Operculina victoriensis.

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

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

From 600 feet down to 620 feet the beds belong to the Middle Miocene. ~~(xxxxxxxxxxxxxxxx)~~ 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 Balcombian fossil, Ditrupa cornea var. wombetiensis with another variety constricta is very common.

Bore No.66, Kilkenny Plantation, Port Road. S.W. Boundary of Section 387, Hundred of Yatala.

324 feet. Ochreous quartz sand.

331-353 feet. Cream to ochreous calcareous sandstone.

Foraminifera. Discorbis dimidiata, D. turbo, Rotalia beccarii.

360-378 feet. Friable quartz sandstone with foraminifera and fragments of mollusca.

Foraminifera. Rotalia beccarii.

388-400 feet. Grey calcareous sandstone with foraminifera.

Foraminifera. Marginopora vertebralis, Rotalia beccarii, Discorbis cycloclypeus, Elphidium crispum, E. pseudonodosum.

410-440 feet. Grey calcareous sandstone, with foraminifera and mollusca.

Foraminifera. Cribrobulimina polystoma, Marginopora vertebralis, Discorbis cycloclypeus, Rotalia beccarii, Elphidium

adelaidense, E. rotatum.

The sample at 324 feet is referred to the Pleistocene.

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 331 feet down to 378 feet and the lower bed of the typical grey calcareous sandstone from 388 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 395, Hundred of Yatala.

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

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

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

391-393 feet Hard, grey, calcareous sandstone.

393-402 feet. Friable ochreous sandstone with a few foraminifera.

Foraminifera. Rotalia beccarii, Elphidium rotatum.

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

Foraminifera. Quinqueloculina costata, Triloculina tricarinata, Clavulina multicamerata, Marginopora vertebralis, Discorbis dimidiata, D. cycloclypeus, Rotalia beccarii, Elphidium crispum.

Ostracoda. Bythocypis tumefacta.

416-443 feet. Grey calcareous sandstone with a few poorly preserved foraminifera and mollusca.

Foraminifera. Quinqueloculina costata, Cribrobulimina polystoma, Rotalia beccarii, Discorbis cycloclypeus, Notorotalia clathrata, Elphidium adelaidense.

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

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

Bore No.68, Woodville Plantation, Port Road.
S.E. Boundary of Section 398, Hundred of Yatala.

330-336 feet. White quartz sand.

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

345 feet. Shelly sandstone.

The samples from 330 feet down to 336 feet are Pleistocene in age. Foraminifera are absent but fragmentary molluscan shells are common at 345 feet.

Bore No.69, Royal Park, Old Port Road.
Plantation Area, centre S.boundary, Section 443, Hundred of Yatala.

301-317 feet. Cream coloured calcareous sandstone, with a few small fragments, and ostracods (Loxoconcha australis)

318-325 feet. Cream coloured shelly sandstone with foraminifera.

Foraminifera. Quinqueloculina asmophila, Triloculina tricarinata, Spiroloculina excavata, Cribrobulimina polystoma, Clavulina multicamerata, Peneroplis planatus, Marginopora vertebralis, Notorotalia clathrata, Rotalia beccarii, Discorbis patelliformis, Elphidium adelaidense, E. rotatum.

325-335 feet. Sandstone containing foraminifera and abundant shells.

Foraminifera. Quinqueloculina asmophila, Triloculina tricarinata, CFribrobulimina polystoma, Marginopora vertebralis, Sigmoidella elegantissima, Rotalia beccarii, Discorbis cycloclypeus, Elphidium adelaidense

335 feet. (Blonn sand). Very fine sand with minute foraminifera

Foraminifera. Discorbis cycloclypeus, Rotalia beccarii, Elphidium crispum.

352-365 feet. Grey shelly sandstone with numerous foraminifera.

Foraminifera. Quinqueloculina limbata, Q. bouceana, Q. vulgaris, Q. polygona, Q. asmophila, Triloculina tricarinata, Flintina triquetra, F. intermedia, Massilina lapidigera, Spiroloculina excavata, Peneroplis planatus, Soritea marginalis, Marginopora vertebralis, Valvulina Aavidiana, (c), V. fusca, Cribrobulimina polystoma (c), Nubeculeria lucifuga var. lapidea, Clavulina multicamerata, Sigmoidella elegantissima, S. kaeaensis, Guttulina regina, G. lactea, G. problema, G. cf. yabei, Discorbis dimidiata, D. cycloclypeus, Notorotalia clathrata, Rotalia beccarii, Epistomaria polystomelloides, Elphidium adelaidense, E. rotatum.

Ostracods. Loxoconcha australis, Bythocypris tumefacta.

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

Foraminifera. Rotalia beccarii, Discorbis cycloclypeus, Elphidium adelaidense, E. crispum.

Ostracoda. Cytherella lata, Loxoconcha australis.

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 foraminifera. 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 foraminifera.

Foraminifera. Marginopora vertebralis, Discorbis cycloclypeus, Eponides repandus, Elphidium sp.

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

Foraminifera. Triloculina tricarinata, Marginopora vertebralis, Peneroplis planatus, Cribrobulimina polystoma, Rotalia beccarii, Discorbis cycloclypeus, D. dimidiata, Elphidium rotatum.

377-396 feet. Calcareous sandstone with some foraminifera and numerous molluscs chiefly fragments.

Foraminifera. Quinqueloculina lamarckiana, Q. ammophila, Triloculina tricarinata, Spiroloculina regularis, Cribrobulimina polystoma, Marginopora vertebralis, Sorites marginalis, Peneroplis planatus, Guttulina problema, G. regina, G. irregularis, Sigmoidella kagaensis, S. elegantissima, Discorbis dimidiata, D. orbicularis, D. cycloclypeus, Rotalia beccarii, Elphidium rotatum.

All samples from 339 feet down to 357 feet are of Lower Pliocene age. The typical assemblage of Adelaidean foraminifera is present but specimens are not common.

Bore No.80, M.T.T. Viaduct, Fulham.
H.E. Corner, Section 525, Hundred of Adelaide.

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

Foraminifera. Sigmoidella kagaensis, Rotalia beccarii.

354-390 feet. Friable grey sandstone with a few foraminifera and molluscs indeterminate.

Foraminifera. Cribrobulimina polystoma, Discorbis cycloclypeus, Epistomaria polystomelloides, Rotalia beccarii.

390-479 feet. Grey calcareous sandstone with foraminifera.

Foraminifera. Clavulina multicamerata, Cribrobulimina polystoma, Sigmoidella elegantissima, Cibicides ungerianus, Heterotalia clathrata, Epistomaria polystomelloides, Elphidium adelaidense, E. rotatum.

479-485 feet. Grey calcareous sandstone with a few foraminifera, large fragments of Ostrea and ostracods.

Foraminifera. Quinqueloculina asmophila, Clavulina multicamerata, Sigmoidella elegantissima, Heterotalia clathrata, Discorbis cycloclypeus, Elphidium adelaidense.

Ostracods. Cytherella lata.

All samples from this bore belong to the Adelaidean stage in which typical foraminifera 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 385 feet.

Bore No.83. Twickenham-Netley.
N.W. Corner, Section 191, Hundred of Adelaide.

310-362 feet Grit.

373-385 feet Dark grey carbonaceous shale. No fossils.

385-393 feet Sandstone with foraminifera and shell fragments.

Foraminifera. Quinqueloculina vulgaris, Triloculina tricarinata, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense.

393-445 feet. Grey calcareous sandstone, chiefly hard, with foraminifera and some molluscs.

Foraminifera. Quinqueloculina asmophila, Q. disparilis, Q. polygona, Massilina lapidigera, Peneroplis planatus, Marginulopsis vertebralis, Cribrobulimina polystoma, Valvulina fusca, Guttulina problema, Sigmoidella kingsmilli, Pseudopolymorphina doanei, Heterotalia clathrata, Elphidium crispum, E. rotatum.

445-475 feet. Shelly sandstone, with foraminifera.

Foraminifera. Quinqueloculina asmophila, Q. vulgaris, Guttulina problema, Rotalia beccarii, Epistomaria polystomelloides, Discorbis dimidiata.

The samples from 310 feet down to 362 feet are referred to the Pleistocene. The carbonaceous shale at 373-385 feet is

uncommon in the Pleistocene in the bore samples.

The Adelaidean stage of the Lower Pliocene is represented from 385 feet down to 475 feet and the characteristic foraminiferal assemblage of the stage is present. The upper bed occurs from 385 feet down to 392 feet and the lower one from 395 feet down to 475 feet.

Bore on T. Bamber's property, Seaton Gardens. Centre, W. boundary, Section 443, Hundred of Yatala.

325-347 feet. Yellowish sandstone.

347-349 feet. Cream coloured sandstone with foraminifera scarce

Foraminifera. Notorotalia clathrata.

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

390-457 feet. Grey shelly sandstone with foraminifera.

Foraminifera. Pyrgo bulloides, Triloculina tricarinata, Cribrobulimina polystoma, Marginopora vertebralis, Guttulina problema, Sigmoidella elegantissima, Discorbis dimidiata, D. cycloclypeus, Notorotalia clathrata, Rotalia beccarii, Elphidium adelaidense, E. rotatum.

The yellowish sandstone at 325-347 feet is referred to the Pleistocene. Lower Pliocene fossiliferous sandstones containing the characteristic assemblage of Adelaidean 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 Mann's Property, Flinders Park. S.W. Corner, Section 392, Hundred of Yatala.

320-407 feet. Friable, yellowish sandstone with a few foraminifera and shell fragments.

Foraminifera. Rotalia beccarii, Nonion depressulum, Elphdium crispum.

407-458 feet Grey calcareous sandstone with foraminifera and mollusca.

Foraminifera. Quinqueloculina lamarckiana, Triloculina tricarinata, Massilina lapidigera, Valvulina davidiana, Cribrobulimina polystoma, Clavulina multicamerata, Marginopora vertebralis (common), Sorites marginalis, Guttulina problema, Sigmoidella kaganensis, S. elegantissima, Rotalia beccarii, Discorbis cycloclypeus, D. acervulinoides,

Epistomaria polystomelloides, Notorotalia clathrata, Elphidium adelaidense, E. chapmani, E. rotatum, E. crispum.

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

Foraminifera. Quinqueloculina lamarckiana, Q. limbata, Q. seminulum, Q. disparilis, Q. schreiberiana, Triloculina tricarinata, Cribrobulimina polystoma, Clavulina multicamerata, Verneuilina triquetra, Marginopora vertebralis, Guttulina regina, G. lactea, G. problema, Rotalia beccarii, Discorbis acervulinoides, D. cycloclypeus, D. orbicularis, Epistomaria polystomelloides, 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.E. Corner, Section 1, Hundred of Adelaide.

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

Foraminifera. Quinqueloculina vulgaris, Cribrobulimina polystoma, Discorbis cycloclypeus, D. orbicularis, Elphidium crispum.

364-447 feet. Grey calcareous sandstone with foraminifera.

Foraminifera. Quinqueloculina vulgaris, Triloculina tricarinata, Massilina lapidigera, Flintina triquetra, Marginopora vertebralis, Sigmoidella kaggensis, Guttulina problema, Rotalia beccarii, Discorbis cycloclypeus, D. acervulinoides, Notorotalia clathrata, Epistomaria polystomelloides, Elphidium adelaidense, E. rotatum, E. crispum.

500-509 feet. Hard yellowish bryozoal limestone with foraminifera and Ditrupa tubes.

Foraminifera. Marginopora vertebralis, Operculina victoriensis

509-524 feet. Deep cream coloured sandstone with foraminifera (Operculina victoriensis common) and tubes of Ditrupa.

Foraminifera. Textularia sagittula, Marginopora vertebralis, Sigmoidella elegantissima, Sigmomorphina subregularis, Gypsina howchini, Acervulina inhaerens, Baggina philippinensis, Discorbis cycloclypeus, Epistomaria polystomelloides, cf. Hofkerina semiornata, Crespinella umbonifera, Elphidium adelaidense, E. chapmani,

E. parri, Operculina victoriensis.

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

Foraminifera. Textularia sagittula, Nodosaria vertebralis, Guttulina irregularis, G. problema, G. costulata, Sigmoidella elegantissima, Sigmomorphina regularis, Glandulina laevigata, Cyclina howchini, Reggina philippinensis, Enistomaria polystomelloides, Discorbis cycloclypeus, Notorotalia howchini, Nonion depressulum, N. victoriense, Elphidium parri, E. charmani, Operculina victoriensis.

Ostracoda. Bairdia ovata, Cythere parallelogramma, C. cf. lepralioides.

From 350 feet down to 447 feet the bore passes through Lower Pliocene fossiliferous sandstones of the Adelaidean stage in which characteristic foraminifera 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. Pape's property, Fulham Gardens.
Section 423, Hundred of Yatala.

365-367 feet. Fine sand with small foraminifera.

368-380 feet. Quartz sand and hard, grey calcareous sandstone, with a few foraminifera and small shell fragments.

Foraminifera. Triloculina tricarinata, Marginopora vertebralis, Discorbis cycloclypeus.

396-405 feet. Grey calcareous sandstone with foraminifera.

Foraminifera. Triloculina tricarinata, Quinqueloculina ammophila, Clavulina multicamerata, Cribrobulimina polystoma, Nubeculeria lucifuga var. lanidea, Marginopora vertebralis, Guttulina regina, Sigmoidella elegantissima, Notorotalia clathrata, Discorbis cycloclypeus, Rotalia beccarii, Elphidium adelaidense E. charmani.

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

Plantae. Lithothamnium ramosissimum.

Foraminifera. Cribrobulimina polystoma, Guttulina problema, Sigmoidella kaeaensis, Discorbis cycloclypeus, Rotalia beccarii.

Ostracoda. Macrocypris tumida.

415-425 feet. Grey calcareous sandstone, with foraminifera, bryozoa and numerous shell fragments.

Foraminifera. Quinqueloculina ammophila, Triloculina tricarinata, T. polygona, Valvulina davidiana, V. fusca, Flintina triquetra, Nubeculeria lucifuga var. lapidea, Cribrobulimina polystoma, Clavulina multicamerata, Gaudryina rugosa, Marginopora vertebralis (c), Sorites marginalis, Guttulina regina, G. regina var. crassicostata, G. problema, Sigmoidella kaeaensis, Discorbis cycloclypeus, Rotalia beccarii, Notorotalia clathrata, Epistomaria polystomelloides, Elphidium rotatum, E. adelaidense, E. chapmani, E. crispum.

Ostracoda. Macrocypris decora, Cytherella lata.

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

Foraminifera. Quinqueloculina ammophila, Valvulina davidiana, Clavulina multicamerata, Cribrobulimina polystoma, Pseudopolymorphina doanei, Discorbis cycloclypeus, Epistomaria polystomelloides, Notorotalia clathrata, Rotalia beccarii, Elphidium rotatum, E. adelaidense.

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

Foraminifera. Quinqueloculina vulgaris, Q. polygona, Triloculina tricarinata, Cribrobulimina polystoma, Marginopora vertebralis, Guttulina problema, Discorbis cycloclypeus, Notorotalia clathrata, Rotalia beccarii, Elphidium adelaidense, E. rotatum, E. chapmani.

450-467 feet. Grey calcareous sandstone with foraminifera.

Foraminifera. Cribrobulimina polystoma, Marginopora vertebralis, Sigmoidella kaeaensis, Discorbis cycloclypeus, Notorotalia clathrata, Rotalia beccarii, Elphidium rotatum, Epistomaria polystomelloides.

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

Typical grey fossiliferous beds of the Lower Pliocene ~~limestone~~ sandstone extend from 368 feet down to 467 feet. Foraminifera of the Adelaidean stage are very numerous, Marginopora vertebralis being common at 415-425 feet.

Bore on K.R. Weymouth's Property, West Beach.
Section 222, Hundred of Adelaide.

0 - 18 feet. Hard to friable, buff coloured sandstone with foraminifera and a few mollusca.

Foraminifera. Quinqueloculina vulgaris, Rotalia beccarii, Discorbis cycloclypeus, D. turbo, D. dimidiata.

320-335 feet. Hard coarse grained calcareous sandstone with small foraminifera.

335-340 feet. Friable sandstone with small, poorly preserved shells.

340-345 feet. Fine sandstone, with a few small foraminifera.

Foraminifera. Rotalia beccarii, Nonion depressulum, Elphidium crispum.

345-351 feet. Grey sandstone with a few foraminifera and some molluscs.

Foraminifera. Triloculina tricarinata, Guttulina regina, G. problema, Discorbis dimidiatus, Elphidium adelaidense.

351-360 feet. Grey sandstone with numerous foraminifera and some molluscs.

Foraminifera. Triloculina tricarinata, Valvulina davidiana, V. fusca, Cribrobulimina polystoma (c), Clavulina multicamerata, Marginopora vertebralis, Rotalia beccarii, Discorbis cycloclypeus, D. dimidiata, Epistomaria polystomelloides (c), Elphidium crispum.

360-367 feet. Fine sandstone with small foraminifera (Rotalia beccarii).

367-370 feet. Hard grey shelly limestone.

370-380 feet. Hard to friable calcareous sandstone with numerous rod-like bodies, cf. algae, few foraminifera, and molluscs.

Foraminifera. Cribrobulimina polystoma, Marginopora vertebralis, Discorbis cycloclypeus, D. dimidiata, Rotalia beccarii

390-397 feet. Grey sandstone with numerous foraminifera.

Foraminifera. Quinqueloculina ammophila, Q. disparilis, Q. vulgaris, Triloculina tricarinata, Spiroloculina excavata, Marginopora vertebralis, Sorites marginalis, Cribrobulimina polystoma (c), Valvulina davidiana, V. fusca, Clavulina multicamerata, Gaudryina rugosa, Verneuilina triquetra, Globulina gibba, Sigmoidella kageensis, S. elegantissima, Pseudopolymorphina doanei, Notorotalia clathrata, (c), Discorbis cycloclypeus(c), D. orbicularis, D. dimidiata (c), Rotalia beccarii, (c), Elphidium adelaidense, E. rotatum.

397-445 feet. Hard to friable sandstone with foraminifera not as common as in 390-397 feet, and molluscs especially Ostrea.

Foraminifera. Marginopora vertebralis, Valvulina davidiana, Textularia gramen, Cribrobulimina polystoma, Gaudryina rugosa, Clavulina multicamerata, Pavonina flabelliformis, Sigmoidella kageensis, S. elegantissima, Guttulina problema, Globigerinoides trilobus, Baggina philippinensis, Notorotalia clathrata, Discorbis cycloclypeus, Rotalia beccarii, Cibicides cf. victoriensis (c), Elphidium adelaidense, E. rotatum, E. chapmani.

445-450 feet. Fragments of mollusca chiefly of Ostrea.

The sandstone 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 foraminifera characteristic of the Adelaidean assemblage are present.

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

271-294 feet. Calcareous sandstone with foraminifera (Operculina victoriensis common), fragments of echinoid spines and bryozoa.

Foraminifera. Sigmoidella elegantissima, Sigmomorphina subregularis, Gypsina globulus, Eponides scabriculus, Elphidium adelaidense, Operculina victoriensis.

294-334 feet. Black carbonaceous shale with fragments of cream limestone, foraminifera, poorly preserved mollusca and ostracoda.

Foraminifera. Pyrgo anomala, Triloculina tricarinata, Massilina lepidigera, Pyrgoella sphaera, Quinqueloculina lamarckiana, Q. schreibersiana, Cornuspira foliacea, Austrotrillina howchini, Dorothia parri, Textularia sagittula, Marginopora vertebralis, Sigmoidella elegantissima, Guttulina problema, Gypsina howchini, Cibicides victoriensis, Elphidium adelaidense, E. champani, Amphistegina lessonii, Operculina victoriensis.

Ostracoda. Bairdia amygdaloides, Cythere dictyon.

334-362 feet. Grey bryozoal limestone with foraminifera and ostracoda.

Foraminifera. Dentalina obliqua, Sigmomorphina subregularis, Sigmoidella elegantissima, S. kaganensis, Siphonina australis, Carpenteria proteiformis, Eponides repandus, Amphistegina lessonii, Operculina victoriensis.

Ostracoda. Bairdia amygdaloides, Cythere dictyon.

362-400 feet. Yellowish limestone with foraminifera, (Operculina abundant) and ostracoda.

Foraminifera. Textularia sagittula, Dentalina obliqua, D. soluta, Sigmoidella elegantissima, Sigmomorphina subregularis, Gypsina howchini, Calcarina verriculata

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

Ostracoda. Macrocypris decora, Cythere flexicostata, Cytherella lata, Xestolebris variegata.

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

Foraminifera. Gaudryina rugosa, Miniacina minutum, Calcarina verriculata (c), Operculina victoriensis (c).

461 feet. Ochreous, bryozoal limestone with foraminifera.

Foraminifera. Pseudoglandulina comata, Planorbulina mediterranensis, Calcarina verriculata, 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 area. The zonal form Austrotrillina howchini occurs at 294-334 feet where it is associated with a typical assemblage of foraminifera including Marginopora vertebralis, Gypsina howchini, Calcarina verriculata, and Operculina victoriensis which is very common. The ostracoda are characteristic of the Balcombian assemblage.

Bore on L.S. Ackland's Property, Glandore.
Section 53, Hundred of Adelaide.

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

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

Foraminifera. Rotalia beccarii, Astrononion australe, Elphidium crispum, E. adelaidense.

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

Foraminifera. Rotalia beccarii, Discorbis cycloclypeus.

Ostracoda. Macrocypris decora.

97-102 feet. Hard calcareous sandstone with foraminifera and shell fragments also numerous grains of brown glauconite.

155-160 feet. Grey bryozoa sandstone with numerous small foraminifera and ostracoda.

Foraminifera. Pyrgoella sphaera, Quinqueloculina venusta, Q. polygona, Q. vulgaris, Triloculina tricarinata,

Massilina torquevensis, Sigmoilina victoriensis, S. cf. miocenica, Miliolinella oblonga, Ophthalmidium sp. Cornuspira involvens, C. cf. foliacea, Reophax scorpiurus var. testacea, Dorothia parri, Gaudryina (Pseudogaudryina) crespinae, Bolivina victoriana, Buliminella elegantissima, Cassidulina subglobosa, Lagena marginata, Oolina hexagona, O. globosa, Dentalina emaciata, D. soluta, Nodosaria arundinea, Marginulina glabra, Frondicularia sp., Glandulina laevigata, Guttulina lactea, G. irregularis, G. problema, Sigmomorphina cf. trinitatensis, Pseudopolymorphina rutila var. parri, Sherbornina atkinsoni, Spirillina decorata, S. pectinimarginata, Discorbis opercularis, D. patelliformis, D. sp., D. australis, Cibicides refulgens, C. sp. 1, Eponides scabriculus, Planulina sp., Anomalina glabrata, A. grosserugosa, Elphidium crespatum, E. pseudoinflatum, Amphistegina lessonii.

Ostracoda. Bairdia subdeltoidea, Macrocypris tumida, Bythobythere arenosa, Cythere dictyon, C. postdeclivis, C. demissa, Alatacythere praeantarcticum, Cytherella punctata, C. lata, Loxoconcha australis.

The samples from 87 feet down to 102 feet are Lower Pliocene in age and are referable to the Adelaidean stage. Glauconite is common from 96 feet down to 102 feet where it replaces many foraminiferal tests. This glauconitic facies is uncommon in the Adelaidean stage.

The bryozoal sandstone from 155 feet down to 160 feet is Middle Miocene in age and belongs to the Janjukian stage. Typical foraminifera include Massilina torquevensis and Sherbornina atkinsoni. The ostracods are typical of Janjukian assemblages.

Bore on S.A. Ivimey's Property, Warrenda le.
N.W. Corner, Section 140, Hundred of Noarlunga.

130-132 feet. Pale yellowish sandstone.

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

Foraminifera. Rotalia beccarii, Nonion sp., Elphidium sp.

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

Foraminifera. Quinqueloculina vulgaris, Massilina torquevensis, Sigmoilina victoriensis, Dorothia parri, Dentalina obliqua, D. soluta, Glandulina laevigata, Guttulina problema, G. irregularis, Globulina gibba, Sigmomorphina vaughani, Cibicides sp. nov., Anomalina nonionoides.

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

Foraminifera. Quinqueloculina vulgaris, Cyclammina sp., Verneuilina triquetra, Dentalina subcostata,

Guttulina irregularis, Cibicides lobatulus, C. sp., Anomalina nonionoides.

Ostracoda. Cythere scutigera.

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

Foraminifera. Cassidulina subglobosa, Guttulina irregularis, cf. Carnerieria rotaliformis, Cibicides cf. sorrentae, C. refulgemus, Sherbornina sp., Eponides repandus, Discorbis globularis.

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

The glauconitic marls and sandstone from 206 feet down to 270 feet are Middle Miocene and represent the lowest part of the Janjukian stage exposed in the cliffs at Aldinga. Characteristic Janjukian foraminifera include Massilina tornuvensis and Sherbornina atkinsoni.

Bore No.1. A.H. Kentish's Property, Direk. Section 3078, Hundred of Munno Para.

140-200 feet. Ochreous to yellow, fine to coarse grained sandstone.

200-240 feet. Sandstone consisting of fine angular and coarse, rounded to angular quartz grains and carbonaceous material.

240-260 feet. Fine shelly sandstone consisting almost entirely of fragments of pelecypoda indeterminate with a few worn foraminifera.

Foraminifera. Rotalia beccarii, Elphidium adelaidense.

280-318 feet. Grey fossiliferous sandstone with numerous foraminifera, corals, tubes of Ditrupa, a few bryozoa and ostracoda.

Foraminifera. Quinqueloculina ammophila, Q. seminulum, Q. polygona, Q. adelaidensis, Triloculina tricarinata, Schlumbergerina sp., Spiroloculina antillarum, Austrotrillina howchini (common), Clavulina multicamerata, Marginopora vertebralis, Soritea marginalis, Sigmomorphina subregularis, Sigmoidella elegantissima, Discorbis cycloclypeus, Rotalia beccarii,(r), Epistomaria polystomelloides, Cymbaina howchini, Crespinella umbonifera (c), Elphidium parri, E. adelaidense, Operculina victoriensis (c).

Ostracoda. Cytheropteron 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 Cytheropteron batesfordiense is also present

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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 foraminifera 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.

Foraminifera. Quinqueloculina vulgaris, Austrotrillina howchini

Textularia sagittula, Marginopora vertebralis, Sorites marginalis, Sigmoidella elegantissima, Sigmomorphina subregularis, Baggina philippinensis, Eponides scabriculus, Epistomaria polystomelloides, Gypsina howchini, Crespinella umbonifera, Amphistegina lessonii, Operculina victoriensis. Nonion victoriensis.

Ostracoda. Cythere postdeclivis, Cytheropteron batesfordiense.

The unfossiliferous sandstones from 150 feet down to 265 feet are referred to the Pleistocene.

At 265 feet the bore passes into Middle Miocene sediments which persist until the bottom of the bore at 365 feet. The typical assemblage of Balcombian foraminifera is present, the zonal species Austrotrillina howchini being common.

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CANBERRA.
4th January, 1949.