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REPORT ON A COLLECTION OF FOSSILS FROM THE LAKES ENTRANCE SHAFT, GIPPSLAND,
VICTORIA

by

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DEPARTMENT OF SUPPLY AND SHIPPING

MINERAL RESOURCES SURVEY

Report No. 1943/9.

REPORT ON A COLLECTION OF FOSSILS FROM THE LAKES
ENTRANCE SHAFT, GIPPSLAND, VICTORIA.

A visit of inspection to the Lakes Entrance Shaft, with the object of making a collection of fossils from the sediments already excavated, was made on the 17th and 18th of December, 1942.

The shaft is situated $7\frac{1}{2}$ chains north-west of Foster's Bore at an elevation of about 90 feet above sea-level. At the time of inspection, the shaft had reached the depth of 220 feet (to which depth it had been concreted) having penetrated the bryozoal marls and limestones characteristic of the upper part of the Balcombian stage of the Middle Miocene.

The material from the shaft is dumped from a platform which is 87 feet in length with a maximum height of about 30 feet. The earliest loads of sediments from the uppermost beds in the shaft were deposited nearest the workings and then some sort of downward sequence was preserved in an outward direction, i.e. from east to west, until the length of 87 feet had been covered. This accounted for the sediments down to 208 feet which included those representing the sequence downward from the Kalimnan to the base of the Upper Miocene (Mitchellian). After this the loads were deposited anywhere along the dump the Italian workmen thought suitable. Consequently the rich shelly Kalimnan sediments were practically covered over at the time of my arrival. The few good specimens collected were secured from loose blocks lying around.

It is understood that beautifully preserved shells were abundant above the depth of 80 feet. One species of *Cypraea*, a specimen of which was given to me by one of the workmen represents a new record for the Kalimnan. The genus itself is rare in this stage.

The list of fossils recognised is fairly comprehensive but for the reasons stated it consists chiefly of small forms obtained by washing down the sandy marls.

The approximate depths at which the various palaeontological horizons were encountered in the shaft are given below, the sequence and lithology of the beds being identical with that proved in all bores in the vicinity.

Post Kalimnan Sands	- From surface down to a depth of a few feet.
Lower Pliocene (Kalimnan Stage)	- Down to 150 feet.
Upper Miocene (Mitchellian Stage)	- From 150 down to 208 feet.
Middle Miocene (Balcombian Stage)	- From 208 feet down to 220 feet (depth of shaft at time of visit)

After passing through a shallow thickness of sands, the shaft penetrated marine beds, which represent the top of the Kalimnan stage, beds referable to this stage extending down to 150 feet. An upper bed, which continues down to 50 feet, consisted of hard, concretionary to friable, ochreous, shelly marl and represents an easterly continuation of

that exposed in the cutting on the left hand side of the road leading to the Imray Well, and opposite the turn-off to the Golf Links which are on the way to the shaft.

Then follow the greenish grey, sandy marls with numerous shells typical of the Kalimnan stage and extending down to 150 feet, with, it is understood, a very rich assemblage of pelecypoda and gasteropoda at 80 feet. Glauconite is very common in these sandy marls. A complete list of fossils present appear under 1.

The Upper Miocene (Mitchellian Stage) is represented from 150 feet down to 208 feet, the sediments being grey, shelly, glauconitic marls passing down to shelly marls containing numerous bryozoa. The shells are for the most part decomposed appearing as whitish casts and moulds as is characteristic of this stage in all bores in the Lakes Entrance area. Fossils are listed under 2.

Below 208 feet, the shaft passes into bryozoal limestones marly limestones of the Balcombian stage. *Ostrea* valves are common at the top of the stage and a few good specimens of *Serripecten* were collected. These bryozoal limestones and marly limestones with interbedded marls are likely to persist down to about 900 feet. Fossils are listed under 3.

Fossils from the various horizons are listed below.

1. Lower Pliocene (Kalimnan Stage), from below top sands down to 150 feet.

Ochreous marl passing downwards into greenish grey, sandy marl, with shells and glauconite.

FORAMINIFERA - *Quinqueloculina vulgaris*, *Q. lamarckiana*, *Q. Ammophila*, *Triloculina tricarinata*, *T. schriebersiana*, *Sigmoilina schumbergeri*, *Spiroloculina dispana*, *Listerella communis*, *Textularia carinata*, *Bolivina limbata*, *Bulimina echinata*, *Lagena globosa*, *L. laevis*, *L. gracilis*, *Nodosaria vertebralis*, *Dentalina soluta*, *Lenticulina cultrata*, *L. costata*, *Rectobolivina bifrons* var. *striatula*, *Guttulina regina*, *G. lactea*, *Pyrulina fusiformis*, *Uvigerina* cf. *pigmea*, *Anomalina* Sp.1, *Cibicidella variabilis*, *Cancris auriculus*, *Notorotalia* cf. *clathrata*, *Epistomina elegans*, *Discorbis australis*, *Nonion victoriense*, *Astrononion australe*, *Elphidium imperatrix*, *E. crispum*.

ANTHOZOA. - *Sphenotrochus alatus*, *S. emaciatus*, *Notophyllia variolaris*, *Mopsea* sp.1.

ECHINODERMA - *Steriocidaris australiae*.

BRYOZOA - *Cellaria depressa*, *C. fistulosa*, *C. rigida*, *C. rigida* var. *perampla*, *Melicerita angustiloba*, *M. acutimarginata*, *Otionella cupola*, *Selenaria punctata*, *S. maculata*, *Lunulites canaliculata*, *Membranipora dentata*, *Cellepora fossa*, *C. coronopus*, *Conescharellina philippinensis*, *Porina vertebralis*, *Schizoporella burlingtoniensis*, *Dakaria crassocirca*, *Didymosella larvalis*, *Smittinella tatei*, *Hornera striata*, *H. diffusa*.

BRACHIOPODA - *Magellania grandis*, *Stethothyris insolita*.

PELECYPODA. - *Nuculana woodsi*, *Ropoleda huttoni*, *Ostrea arenicola*, *Modiola* cf. *adelaidensis*, *Anomia tatei*, *Dimya dissimilis*, *Chlamys antiaustralis*, *C. sturtianus*, *C. meringae*, *Lima* (*Limatula*) *jeffreysiana*, *Linnea transenna*, *Arca* cf. *limatella*, *Cucullaea corioensis*, *Spondylus pseudoradulus*, *Limopsis beaumarieensis*, *Glycymeris convexus*, *G. subtrigonalis*, *G. tenuicostata*, *Venericardia gippslandica*, *V. compacta*, *V. subcompacta*, *V. spinulosa*, *Cardita kalimnae*, *Dosinia johnstoni*, *Antigona striatissima*, *A. dimorphophylla*, *Clausinella subroborata*, *Catylasia propinqua*, *Mactra howchiniana*, *Tellina aequilatera*, *Salaputium commune*, *Myodora gabrieli*, *Cardium* sp., *Lissarca rubricata*, *Lepton trigonale*, *Neolepton novacambrium*, *Cuna multilamella*, *C. polita*, *C. concentrica*, *C. radiata*, *Neotrigonia acuticostata*,

Divaricella sp., Toredo sp. Zenatiopsis angustata, Aloidis (Notocorbula) ephamilla, Eucrassatella kingicoloides, Panope orbita.

SCAPHOPODA - Dentalium lacteolum, D. aratum.

GASTEROPODA - Turritella conspicabilis, T. acinella, T. tristira, T. sp. nov., Calliostoma semiornata, C. sp. nov., Cantharidus sp. nov., Astraea sp. nov., Terebra catinifera, Olivella nymphaelis, Strutholaria lirata, Phos gregsoni, P. liraecostatus, Bathytoma pritchardi, B. Sp., Mitra alokiza, Inquisitor sp. nov., I. aff. trevori, Turbonilla radicans, Cerithiella trigemmata, Cypraea consobrina, Emerginula transenna, Cymatium annectans, C. sp. nov., Natica hamiltonensis, Sigapatella crassa, Semiactaeon microplocus, Teinostoma calva, Vermicularia (Thylacodes) sp

OSTRACODA - Bairdia subdeltoidea, B. amygdaloides, Macrocypris decova, Aglais clavata, Cythere scutigera, C. canaliculata, Krithe producta, Cytherella lata.

CIRRIPIEDIA - Balanus amphitrite var. acuta.

2. Upper Miocene, from 150 feet down to 208 feet.

Glauconitic shelly marls with white casts and moulds of mollusca, passing downwards into grey bryozoal shelly marls.

FORAMINIFERA - Quinqueloculina ammophila, Spiroloculina dispansa, Sigmolina schlumbergeri, Ammobaculites reophaciformis, Listerella communis, Dorothia bradyana, Gaudryina (Pseudogaudryina) crespinae, Bolivina nobilis, Ehrenbergina serrata, Lagena sulcata, L. favosopunctata, Nodosaria raphanus, Dentalina soluta, D. emaciata, Glandulina laevigata, Lenticulina cultrata, L. gibba, L. pseudorotulata, Guttulina problema, Globigerina bulloides, Cancris auricula, C. philippinensis, Gypsina globulus, Anomalina sp. 1, Eponides repandus, Cibicidella variabilis, Notorotalia howchini, Gyroldina soldanii, Astrononion australe.

ANTHOZOA - Mopsea tenisoni, M. sp. 1.

BRYOZOA - Cellaria rigida, C. rigida var. perampla, C. divaricata, Melicertia angustiloba, M. acutimarginata, M. sorrentae, Selenaria sp., Otionella cupola, Thalamoporella gracilis, Crateropora patula, Conescharrellina philippinensis, Cellepora fossa, Hippomonella abdita, Schizoporella alata, Porina gracilis, Dakaria crassocirca, Didymosella larvalis, Crisia acropora, Idmonea contorta, I. incurva, I. milneana, Lichenopora radiata.

PELECYPODA - Nuculana woodsi, Ostrea arenicola, Lima (Limatula) jeffreysiana, Spondylus baileyanus, S. pseudoradulus, Chlamys meringae, Serripecten yahliensis, Limnea transenna, Cucullaea corioensis, Glycymeris subtrigonalis, Venericardia spinulosa, V. subcompacta, Antigona dimorphyophylla, Salaputium commune, Cuna concentrica, C. radiata, Lissarca cincturata, Pteria (Meleagrina) crassicardia.

GASTEROPODA - Turritella acinella, Cypraea sp., Haurakia gabrieli

OSTRACODA - Bairdia amygdaloides, B. subdeltoidea, Macrocypris decora, Bythocythere arenosa, Pseudocythere caudata, Cythere canaliculata, C. scutigera, C. sorrentae, C. dasyderma, Loxoconcha australis, Xestoleberis variegata, Alatacythere praeantarcticum, Cytherella lata, C. punctata.

CIRRIPIEDIA - Balanus amphitrite var. acuta.

PISCES - Otoliths and spines.

3. Middle Miocene (Balcombian Stage) from 208 feet down to 220 feet - the depth of the shaft at time of visit.

Grey, bryozoal limestone and marly limestone.

FORAMINIFERA - Textularia sagittula, T. fistulosa, Gaudryina rugosa, G. (Pseudogaudryina) crespinae, Lagena marginata, L. favosopunctata, Lenticulina sp. 1, Globigerina bulloides, Gypsina globulus, Heronallenia lingulata, Cibicides lobatulus, Discorbis australis, Eponides repandus, E. concentricus, Notorotalia howchini, Elphidium crispum.

ECHINODERMA - Steriocidaris australiae.

BRYOZOA - Catenicella hastata, Hincksina geminata, Tremopora staminis, Thalamoporella gracilis, Crateropora patula, Corbulipora ornata, Gaberea grandis, Petralliella corrugata, Lepralia bairnsdalei, Cribrilina terminata, Schizoporella alata, Didymosella larvalis, Costazia producta, Chiastosella pprosa, Smittinella tatei, Retepora rimata, Crisia acropora, Idmonea milneana, I. incurva, I. trigona, Mecynoecia proboscidea, Hornera striata, H. tuberculata, Lichenopora radiata.

PELECYPODA - Ostrea arenicola (common at top), Serripecten yahliensis.

OSTRACODA - Bairdia subdeltoidea, Aglaia clavata, Cythere lactea.

The most noteworthy feature in these fossil assemblages is the occurrence in the Kalimnan stage of several specimens of two species of gasteropoda, namely Calliostoma semiornata Chapman and Cypraea consobrina McCoy, as well as new species of Calliostoma and Cantharidus. C. semiornata and C. consobrina have been considered as restricted to the stratigraphically older stage, the Balcombian. The discovery of their presence in younger beds further illustrates the loss of information regarding the stratigraphic range of supposed restricted forms, which could have been obtained during the sinking of the shaft down to the depth of 150 feet. This could have been prevented if systematic collection of Kalimnan material had been arranged.

The assemblages in the Upper Miocene and in the upper portion of the Balcombian stage are similar to those which have been listed from these horizons in numerous reports on bores in the area.

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