

VOLUME 14

PART 4

MEMOIRS
OF THE
QUEENSLAND MUSEUM

BRISBANE



VOLUME 14

PART 4

MEMOIRS
OF THE
QUEENSLAND MUSEUM

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A NEW SPECIES OF VENOMOUS ECHINOID FROM QUEENSLAND WATERS

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Two echinothurids trawled from a depth of 47 fathoms in southern Queensland waters could not be referred to any known species. The larger specimen is selected as the holotype of a new species and a specific description follows.

Family **ECHINOTHURIDAE** Wyville Thomson

Genus **ASTHENOSOMA** Grube

ASTHENOSOMA PERICULOSUM sp. nov.

Plate 12, figures 1-2; figure 1 A-F

SHAPE AND DIMENSIONS.—The test is low, flexible, and possesses an ambitus which is almost circular in outline. It is approximately 87 mm. in diameter.

AMBULACRA.—There are 63-64 plates in each column of the ambulacra. About 26 of these plates are found on the oral surface. Here, many of them bear two primary tubercles, one in the poriferous zone and one in the non-poriferous zone. The latter tubercle is the larger and occupies the whole height of the plate which bears it. However, there is a tendency for this large primary tubercle to be present only on every second ambulacral plate. Although somewhat irregularly arranged, these tubercles form in each column of each ambulacrum a series which converges distally towards the mid-line of the ambulacrum. The primary tubercles in the poriferous areas are present on each ambulacral plate and form a regular series. A variable number of secondary tubercles occurs on each ambulacral plate.

Near the ambitus primary tubercles disappear and each ambulacral plate carries a horizontal row of 16-17 secondary tubercles. Such horizontal rows of secondary tubercles are found on the ambulacral plates of the aboral surface. The number of tubercles per row decreases apically as the ambulacral plates become shorter, and the most distal ambulacral plate in each column is usually devoid of tubercles. Adorally, the tube-feet, which possess well developed sucking discs, are arranged in distinct arcs of three, but on the aboral surface they tend to form an almost horizontal line. The small demi-plates of each ambulacral plate are enclosed between the borders of each two successive primary plates.

INTERAMBULACRA.—There are 36-37 plates in each column of the interambulacra. About 16 of these plates are found on the oral surface. Each of these oral interambulacral plates bears two, occasionally three, primary tubercles. A large primary tubercle is carried at the adradial end of each of these plates and these tubercles form a regular series. The other primary tubercles

on these plates are irregularly arranged. Numerous secondary tubercles occur on these plates. Near the ambitus, the primary tubercles disappear and each interambulacral plate carries from 25–27 secondary tubercles in an almost horizontal line. On the aboral surface the number of tubercles carried per interambulacral plate decreases towards the apex of each interambulacrum. There is a tendency for the central region of each aboral interambulacral plate to be narrower than the ends, and for the admedial end of each plate to be turned orally.

Membranous areas are found between the plates of the test, and these membranous interstices are widest between the plates of the interambulacra on the aboral surface. The ambulacral plates bevel under the interambulacral plates. The interambulacra are wider than the ambulacra at the ambitus. The tubercles carried by the plates of the test are perforate, but non-crenulate.

APICAL SYSTEM.—The apical system is not disconnected, and the genital and ocular plates are not subdivided. Genital papillae are found in membranous areas at the distal regions of the genital plates, which extend into the interambulacral mid-lines. The madreporic pores are confined to the second genital plate. There are about 60 small periproctal plates, which bear tubercles, but which exhibit no regular arrangement. Imbricating scales cover the anal papilla.

PERISTOME.—Overlapping plates, which bear tubercles on their edges, cover the peristome. There are twelve such plates in each column. Proximally, the pore-pairs are arranged in a single series, but on the outer plates the pore-pairs are biserial. Small gills are present at the edge of the peristome off the interambulacra.

SPINES.—The primary spines (fig. 1 F) of the oral surface are curved and average about 12 mm. in length. They possess very fine thorns on the distal part and terminate in white hoofs, each about 1 mm. in length. The hoofs are often widest at their bases and do not flare. Fine thorns are also possessed by the secondary spines of the oral surface. These spines average about 4 mm. in length and contain longitudinal rows of perforations. The aboral spines average about 5 mm. in length and are smooth and pointed. Those of the ambulacra are covered with thin skin, whilst those of the interambulacra possess thick glandular skin-sacs. No small poison-spines of the type possessed by *A. varium* Grube were observed.

PEDICELLARIAE.—Tridentate and triphyllous pedicellariae of the same types as are found in other species of *Asthenosoma* are present and, in addition, dactyloous pedicellariae are prominent. The dactyloous pedicellariae (fig. 1 B) appear to be confined to the aboral surface and are noteworthy because of the length of their glandular mass. The stalks which carry the glandular mass are 4–5 mm. in length, and the glandular mass itself is 2–3 mm. in length. The pedicellariae are three-valved, but the valves are small and completely enclosed by the glandular mass which extends far beyond them. Each valve (fig. 1 C) has the form of a rod borne on a basal piece set at right angles to it.

Two kinds of tridentate pedicellariae occur. The larger type (fig. 1 E) averages 1.4 mm. in length and possesses concave valves which are leaf-shaped in outline. Each valve is thickened medially by the development of an open meshwork, but carries no median crest or keel. The edges of each valve are slightly sinuate and minutely serrated. Adjacent valves are in contact for most of their length. These large tridentate pedicellariae can be distinguished readily from those of other species of *Asthenosoma*.

The second type of tridentate pedicellaria (fig. 1 A) averages 0.65 mm. in length and possesses long narrow valves with straight edges. Adjacent valves are in contact for their whole length and each is thickened medially. Although lacking a toothed median keel, these pedicellariae resemble the small tridentate pedicellariae possessed by *A. ijimai* Yoshiwara.

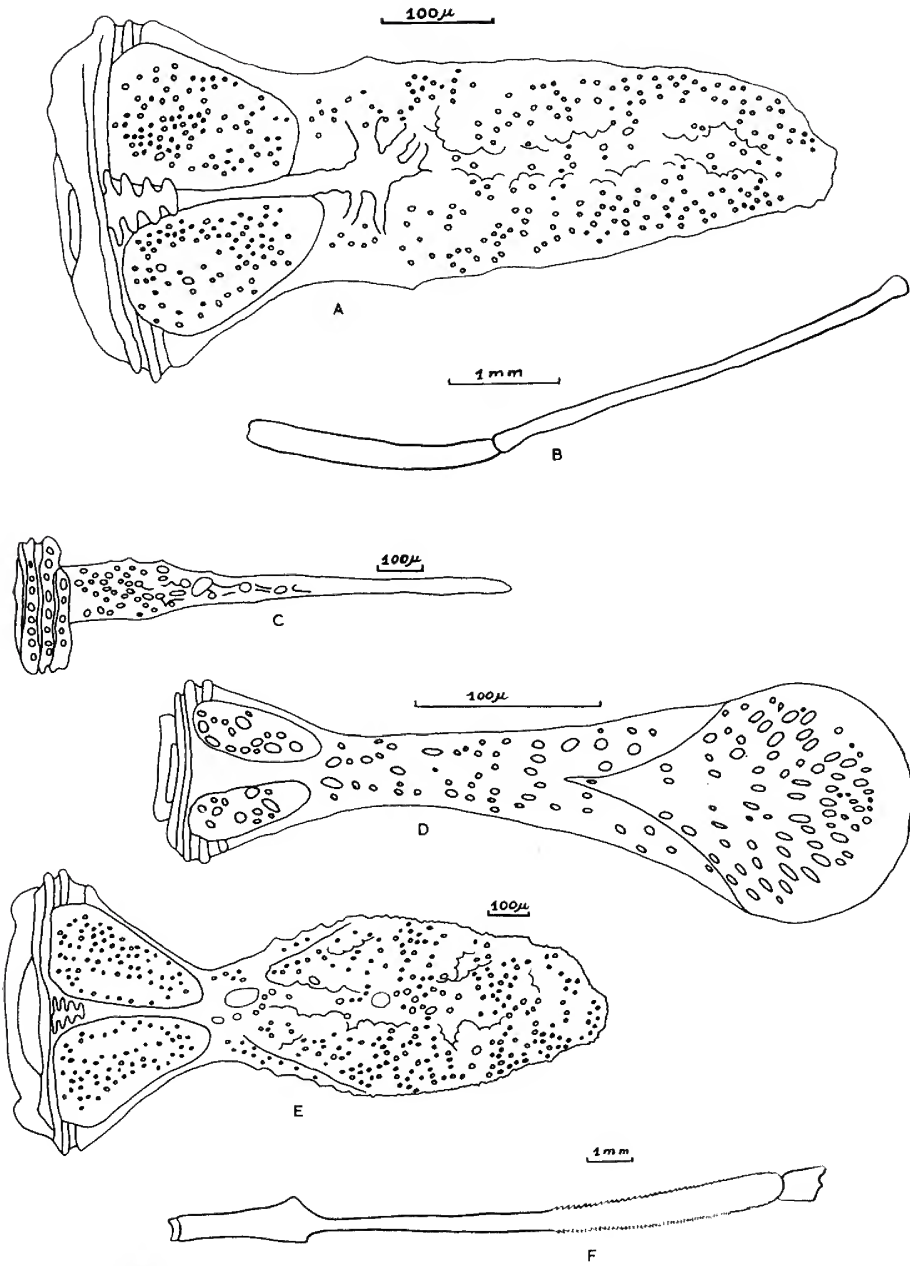


Figure 1.—*Asthenosoma periculosum* sp. nov. A, valve of small tridentate pedicellaria; B, dactyloous pedicellaria; C, valve of dactyloous pedicellaria; D, valve of triphyloous pedicellaria; E, valve of large tridentate pedicellaria; F, primary spine from oral surface.

The triphyllous pedicellariae (fig. 1 D), which average about 0.45 mm. in length, appear to be confined to the aboral surface. Each valve has a slit in the cover-plate as is found in the triphyllous pedicellariae of other species of *Asthenosoma*.

SPHAERIDIA.—Club-shaped sphaeridia occur on the inner demiplates of some of the ambulacral plates, both on the oral and aboral surfaces.

COLOUR.—Aborally, the ambulacral plates are a purplish-brown as are the adradial ends of the interambulacral plates. Patches of purplish-brown occur apically in the interambulacral mid-line, but the major part of each interambulacrum is light brown. Orally, both ambulacral and interambulacral areas are purplish-brown. The primary spines are light greenish banded with purplish-brown. The skin sheathing the ambulacral spines aborally is purplish, whilst the skin-sacs of the aboral interambulacral spines are purplish-black. The glandular mass of each dactyloous pedicellaria is also purplish-black.

TYPES.—The holotype, G. 2604, and paratype, G. 2603, have been lodged with the Queensland Museum.

TYPE LOCALITY.—Both holotype and paratype were trawled, together with fan corals, from a depth of 47 fathoms, approximately five miles due east of Stradbroke Island (1/7/1961) by a party under the direction of Professor W. Stephenson.

VARIATION.—The paratype is 83 mm. in diameter and possesses 62–63 plates in each column of the ambulacra and 35–36 plates in each column of the interambulacra. It resembles the holotype in all respects, apart from a slight difference in colouration. It lacks the small patches of purplish-brown observed in the aboral interambulacral mid-lines of the holotype.

DISCUSSION.—Four other species of *Asthenosoma* (*A. varium*, *A. ijimai*, *A. dilatatum* Mortensen, and *A. intermedium* Clark) are known. *A. dilatatum* is known only from two young specimens and is distinguished from other species of *Asthenosoma* by the possession of large tridentate pedicellariae which have broad leaf-shaped valves. Two specimens of *A. intermedium* are known. Both were found at Lindeman Island, Queensland, and were the only specimens of *Asthenosoma* previously taken from Australian waters. Clark (1938) stated with reference to *A. intermedium* “that the more numerous and very low plates, the tuberculation and the colouration distinguish the Australian species from *ijimai* whilst the same features and the pedicellariae also, prevent confusion with *varium*.” This statement requires discussion.

Although the holotype of *A. intermedium* possesses many more plates in each column of the ambulacra than do specimens of *A. varium* and *A. ijimai* of similar size, it possesses fewer plates in each column of the interambulacra. This is also

true of *A. periculosum* and this species further resembles *A. intermedium* with respect to the shape and arrangement of the ambulacral and interambulacral plates. The primary spines are also similar in the two species. Because of the dried condition of the specimens of *A. intermedium* examined by Clark, he was unable to determine the degree of development of the venom glands on the aboral spines, but states that they were undoubtedly present. The apical system of *A. intermedium* differs from that of *A. periculosum* but the differences may be related to size.

On the other hand, the tuberculation of *A. intermedium* differs considerably from that of *A. periculosum*. Only three to four secondary spines are carried by ambulacral plates on the aboral side in *A. intermedium* whereas those of *A. periculosum* carry three to four times as many. Also, the arrangement of the primary tubercles on the oral side of each species is different. The primary tubercles of the oral ambulacral plates of *A. periculosum* form two series, and the adradial tubercles of the oral interambulacral plates of this species form a regular series. There is a tendency for the primary tubercles of *A. intermedium* to be arranged in series, but these series are somewhat irregular. In the other species of *Asthenosoma* the primary tubercles are irregularly arranged.

It is in the pedicellariae that *A. periculosum* shows marked differences from *A. intermedium*. Clark (1938) states that the pedicellariae of *A. intermedium* were "apparently all of one kind, tridentate with rather elongate heads, the valves up to 2 mm. or more in length, in contact throughout, coarsely dentate near the tips and more or less carinate on the back, they thus resemble the smaller tridentate form of *A. ijimai*." The smaller of Clark's two specimens was shown to Mortensen, who commented that *A. intermedium* was intermediate between *A. varium* and *A. ijimai* and resembled the latter species in its pedicellariae. It is most unlikely that both Clark and Mortensen would have overlooked dactyloous pedicellariae such as are possessed by *A. periculosum*.

The colouration of *A. periculosum* is distinctive and would enable ready recognition of the species in the field. In this respect, it should be noted that *A. varium* exhibits great variation in colour and its spines are banded. Thus colouration is not a feature distinguishing *A. varium* from *A. intermedium* as maintained by Clark (1938).

Because of the presence of dactyloous pedicellariae and the presence of a regular series of primary tubercles at the adradial end of each oral interambulacral plate in *A. periculosum*, difficulties arise concerning the generic status of the species. The definition of the genus *Asthenosoma*, as restricted by Mortensen (1935), requires modification if *A. periculosum* is to be included. On the other hand, there appears to be no justification for the erection of a new genus to accommodate the species. In *A. intermedium* there is a distinct tendency for the primary tubercles to be serially

arranged and the serial arrangement of some of the primary tubercles in *A. periculosum* does not appear to be a feature of great taxonomic importance. The possession of dactylous pedicellariae separates *A. periculosum* from other species of *Asthenosoma*. Moreover, the dactylous pedicellariae are of the type possessed by the genus *Hapalosoma* Mortensen, and the possession of pedicellariae of this type is perhaps the main point of difference between *Hapalosoma* and the genus *Araeosoma* Mortensen. However, the presence of skin-sacs on the aboral spines and the complete absence of primary tubercles from the aboral side of the test are features which enable *A. periculosum* and other species of *Asthenosoma* to be separated readily from species belonging to the genera *Hapalosoma* and *Araeosoma*.

Apart from the possession of oral primary tubercles in regular series and the possession of dactylous pedicellariae, *Asthenosoma periculosum* conforms with the diagnosis of the genus *Asthenosoma* as restricted by Mortensen. It is suggested that Mortensen's diagnosis of the genus be widened so as to include forms possessing dactylous pedicellariae and forms which possess primary tubercles in regular series on the oral side of the test.

Professor W. Stephenson, who handled the fresh specimens of *A. periculosum* when they were brought to the surface, received two punctures in a finger as a result of contact with the aboral spines of one specimen. Pain was immediate and severe, and the stings were likened to those caused by wasps. No systemic effects were noted and there were no obvious after-effects resulting from the stings. Mortensen (1935) stated that all echinothurids sting very badly by means of their poison-spines and refers to a belief that stings from *Asthenosoma* are sometimes fatal. It is evident that fresh specimens of the southern Queensland *Asthenosoma* require careful handling, and the species is given the name *periculosum* to draw attention to this fact.

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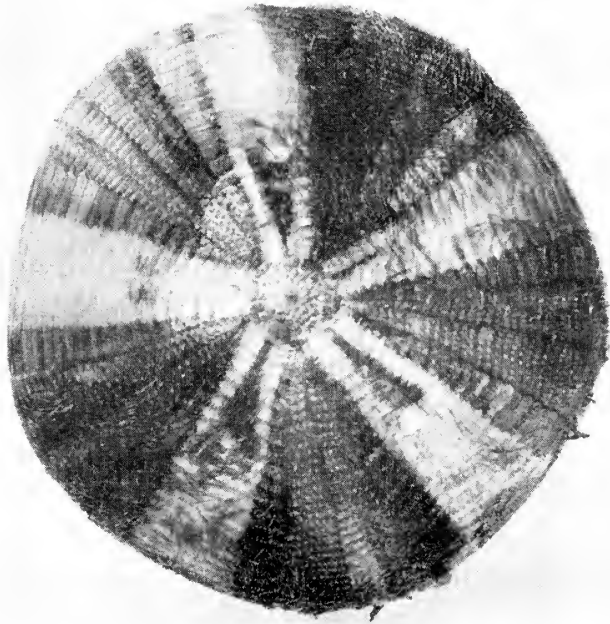
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EXPLANATION OF PLATE XII

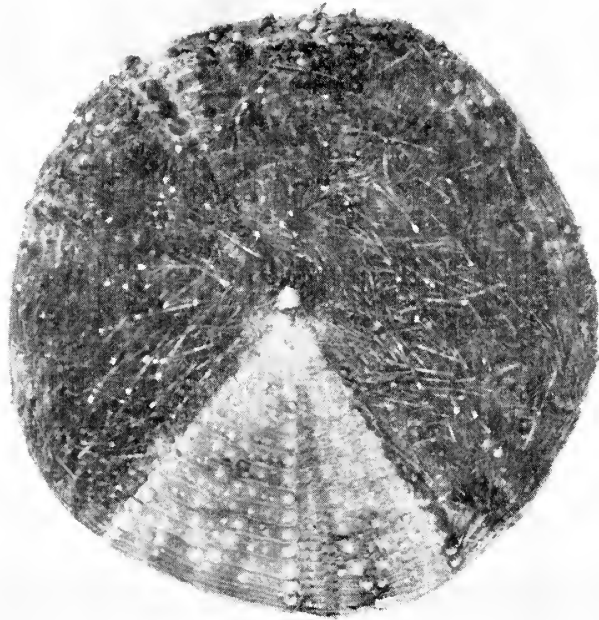
Asthenosoma periculosum sp. nov., holotype.

Fig. 1. Aboral surface.

Fig. 2. Oral surface.



1



2

1 CM.



A NEW SPECIES OF NYMPHAEOBLASTUS (BLASTOIDEA) FROM THE
LOWER CARBONIFEROUS OF QUEENSLAND

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ABSTRACT

Nymphaeoblastus bancroftensis sp. nov. is described from the Lower Carboniferous (Viséan) rocks of the Monto district, south-east Queensland. Relations with previously recognised species from Russia and Japan are briefly discussed.

Specimens of the blastoid were collected by the author in 1960 while mapping Carboniferous sediments to the east of Monto during postgraduate work in the Department of Geology, University of Queensland (U.Q.), and subsequently in 1962, when the locality was revisited during mapping of the Monto 1 : 250,000 Sheet by the Geological Survey of Queensland (G.S.Q.). The species has been found at only one locality 3.5 miles E.S.E. of Bancroft (fig. 1) and even there is very rare. Specimens are preserved as external moulds and internal casts in a dark grey, very fine-grained lithic sandstone, from which the original calcite of calices has been leached by surface weathering processes. The horizon from which the collection was drawn is probably a stratigraphic equivalent of the uppermost part of the Tellebang Formation, defined by Maxwell (1959, 1960), with its typical section on " Baywulla " Station, some 17 miles to the south of the present locality.

Order **FISSICULATA** Jaekel, 1918

Family **PHAENOSCHISMATIDAE** Etheridge and Carpenter, 1886

Genus **NYMPHAEOBLASTUS** von Peetz, 1907, emend. Yakovlev, 1926

TYPE SPECIES.—*Nymphaeoblastus miljukovi* von Peetz, from the Lower Carboniferous of Kazakhstan, Russia.

DIAGNOSIS.—Calyx elongate-ellipsoidal, section subpentagonal; basals confined to concave aboral surface; radials long, deeply incised by radial sinuses; four deltoids, and on anal side a small epideltoid and large hypodeltoid sharing an oval anal aperture; 10–15 hydrosphere slits; ambulacra linear, extending the full height of the calyx; side plates small, very numerous; lancet plate exposed medially.

Previous records of *Nymphaeoblastus* are from the upper Tournaisian and Viséan of Russia (Kazakhstan), and the Viséan of Japan. von Peetz (1907) erected the genus with one species, *N. miljukovi*; subsequently Yakovlev (1926) re-examined the material, emended the original description, and described a new species, *N. anossofi*. A further species, *N. kashakhstanensis*, was described by Yakovlev

(1941), and more recently, the three species were figured and briefly diagnosed by Yakovlev (1956). Minato (1951) figured specimens of *Nymphaeoblastus* from the Do Zone, Jumonji Stage, Arisu Series of north-east Honshu, Japan. The Jumonji Stage was correlated with the *Syringothyris* Zone of the English Avonian (i.e. Viséan) by Minato (1960). Fay (1961) examined the Japanese specimens and found them to belong to a single species, to which he applied the name *N. anossofi* Yakovlev. *Nymphaeoblastus* has not been recognised previously from the southern hemisphere.

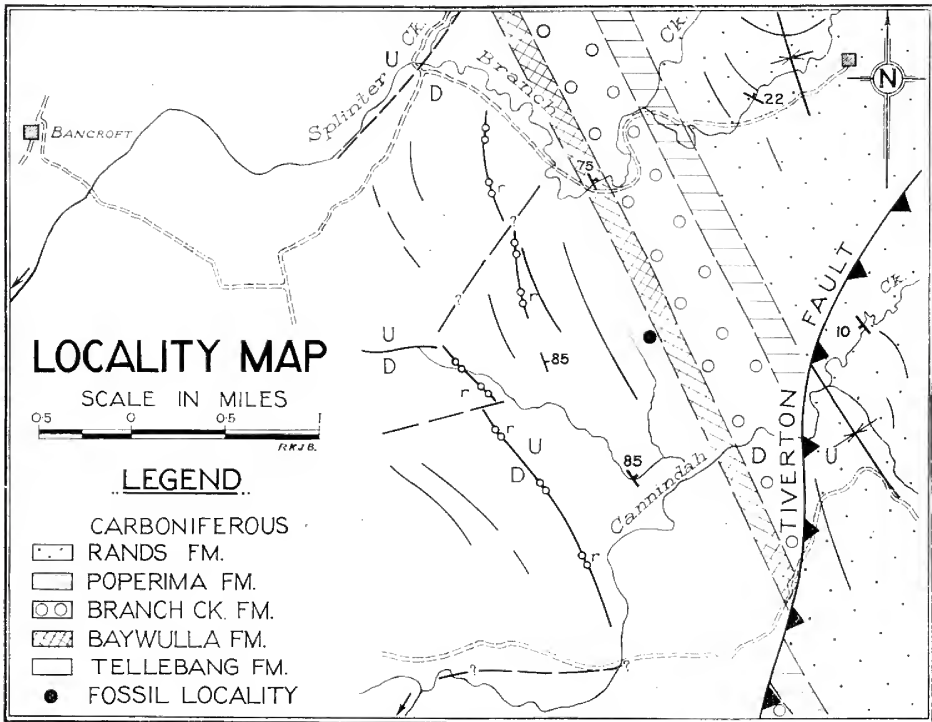


Figure 1.—Blastoid locality near Bancroft, Q.

***NYPHAEOLASTUS BANCROFTENSIS* sp. nov.**

(Plate 13, figures 1–4)

MATERIAL.—Holotype, F. 39410, U.Q. Collection; paratype, F. 39411, U.Q. Collection; F. 5781, G.S.Q. Collection; all from the northern part of Portion 72, Parish of Cannindah, County of Yarrol (lat. $24^{\circ} 48' 18''$ S., long. $151^{\circ} 17' 0''$ E.); Tellebang Formation (Viséan).

DIAGNOSIS.—Small *Nymphaeoblastus*, subpentagonal in dorsal view; 10–12 short hydrospire slits, largely developed on the radial limbs; ambulacra narrow, 80–85 side plates in each series; deltoids with granular ornament, very fine aborally; radials with lateral, elongate-triangular areas of barred ornament, elsewhere, surface granular.

DESCRIPTION.—The calyx is elongate-ellipsoidal in lateral view and subpentagonal when viewed from above. The summit is flattened or slightly depressed, while the basal area, which is incompletely preserved in each specimen, appears to have been concave.

The five radial plates are unequally pentagonal in outline with a length : width ratio of 4 : 3. Radials recurve adaxially below the long, narrow radial sinus, and the small plate body lies within the basal concavity ; adoral margins flare abaxially a little to contact the deltoids. On the holotype, radials clearly overlap the deltoids, but it is probable that this overlap is due to oblique distortion of the calyx subsequent to burial. Ornament is distinctive. An elongate-triangular area on each radial limb, bordered laterally by the inter-radial suture, and with its apex at the radio-deltoid suture, bears parallel ridges, normal to the inter-radial suture and continuous between adjacent plates. Remaining areas are ornamented by coarse granules and bars roughly aligned along growth lines. Hydrospire slits, which number 10–12 on each side of an ambulacrum, are largely confined to semi-elliptic areas on the adoral portion of each radial limb, with only 0.5 mm. of their length on the adjacent deltoid. Bordering an ambulacrum, the slits are 3 mm. long, but attain a maximum length of 5 mm. before decreasing in size toward the inter-radial suture. No specimen has the anal side of the calyx preserved in the region of the radio-deltoid suture, so that the condition of the hydrospires in this segment is unknown.

The four simple deltoids are subtriangular in outline and a little shorter than the radials. A low median angulation of the deltoids, as seen from above, contributes to the overall subpentagonal outline of the calyx. On the anal side a transverse fracture in the deltoid at the midlength of the oval anal opening on specimen F. 39410 (U.Q.), suggests that two anal deltoids, viz. an aboral hypodeltoid and an adoral epideltoid, were in fact developed. Any definite conclusions on the number and disposition of the anal deltoids is precluded by the type of preservation. Deltoids are ornamented by closely spaced granules and ridges developed in series parallel to the plate margins, and becoming larger and more irregular toward a prominent apical node.

The five linear ambulacra extend from within one millimetre of the oral opening over the full height of the calyx ; the lancet plate is exposed medially over most of this length. 80–85 very small side plates, present on each side of an ambulacrum, alternate across the main food groove between obliquely trending, adorally directed side food grooves. Pairs of large brachiolar facets occur at the adlateral termination of the side food grooves. Presumably, the aboral facet occupies the surface of a secondary side plate, and the adoral facet the adjacent side plate limb. Minute grooves radiate from the margins of the side plates into the main and side food grooves.

MEASUREMENTS (mm.)

	CALYX		DELTOIDS		RADIALS		AMBULACRA	
	length	width	length	width	length	width	length	width
F. 39410 (U.Q.) Holotype ..	—	—	17.0	9.0	—	—	—	4.1
F. 39411 (U.Q.) Paratype ..	—	—	—	10.3	20.6	15.7	—	4.4
F. 5781 (G.S.Q.)	26.8	20.5	16.5	9.0	17.4	14.8	29.5	3.7

N.B. Individual plate measurements were taken on the curvature.

The four known species of *Nymphaeoblastus* form a morphologically compact group, in which *N. bancroftensis* sp. nov. is particularly closely allied to *N. miljukovi* von Peetz. It differs from the latter only in the less pronounced median angulation

of the deltoids and its finer ornamentation. *N. anossofi* Yakovlev may be distinguished by its rounded outline in dorsal view and uniform coarsely granular ornament. *N. kasakhstanensis* Yakovlev is consistently very large and hydrospire slits are more numerous than in other species.

At the type locality *N. bancroftensis* sp. nov. is associated with a large brachiopod fauna which includes *Rhipidomella fortimuscula* Cvancara, *Schizophoria* cf. *resupinata* (Martin), *Leptagonia* cf. *analoga* (Phillips), *Pulsia* sp., *Antiquatonia* sp., *Eomarginifera* aff. *paradoxa* (Campbell), *Pustula* cf. *abbotti* Campbell, *Chonetes gloucesterensis* Cvancara, *Prospira striatoconvoluta* (Benson and Dun), *Spirifer lirellus* Cvancara, *Spirifer* aff. *duplicosta* Phillips, *Brachythyris pseudovalis* Campbell, *Phricodothyris campbelli* Cvancara, *Spiriferellina baywullensis* Maxwell, *Cleiothyridina* sp., *Composita* sp., *Eumetria* cf. *mona* Campbell, *Dielasma* sp. and *Lingula* sp. The fauna is comparable with that described by Cvancara (1958) from the upper part of the Lower Burindi Group in north-eastern New South Wales, which he correlated with the Osagean faunas of the Burlington and Keokuk Limestones in North America. Recent work on ammonoids and conodonts (Miller and Garner, 1955; Collinson, Scott and Rexroad, 1962) has shown that the Osagean is to be correlated with the lower Viséan of the European sequence. A Viséan age for the Queensland species would be very reasonable, particularly in view of the known range of *Nymphaeoblastus*.

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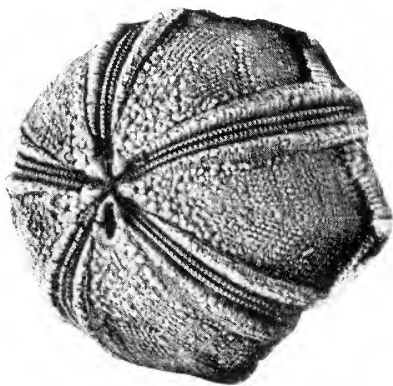
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EXPLANATION OF PLATE XIII

Nymphaeoblastus bancroftensis sp. nov.

- Fig. 1. Oral view of holotype, F. 39410 (U.Q.), showing shape and ornament of deltoids, the anus and oral area; latex cast, X 2.
- Fig. 2. Detailed view of "B" ambulacrum of holotype, F. 39410 (U.Q.), showing the food groove system and side plates with brachiolar facets; external mould, X 11.
- Fig. 3. Side view of F. 5781 (G.S.Q.), a partly distorted calyx; latex cast, X 2 (taken from a weathered external mould.)
- Fig. 4. Side view of paratype, F. 39411 (U.Q.), showing shape and ornament of radial plates and the hydrospire slits; latex cast, X 2.
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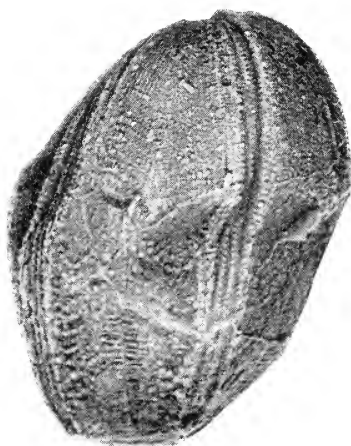




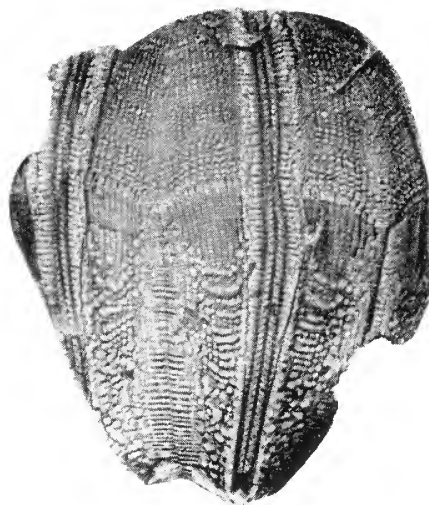
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C. D'OYLY H. APLIN, FIRST GOVERNMENT GEOLOGIST FOR THE
SOUTHERN DISTRICT OF QUEENSLAND

J. T. Woods

Queensland Museum

On the 18th May, 1867, the Reverend George Wight delivered an address to the Queensland Philosophical Society with the title, "On the Appointment of a Government Geologist for Queensland". Wight was interested in geology, and his address, which was printed in the *Queensland Daily Guardian*, as was the custom of the Society at the time, was intended to stimulate some action in the matter. He was familiar with the functions of the Geological Survey of England, and praised the efficient organization of the Geological Survey of Victoria. In pressing the need for a similar scientific aid for the Colony of Queensland, he contended that "The appointment of a thoroughly practical geologist by the Government is, in our judgement, the best, cheapest, and speediest means of guiding and aiding the development of the vast natural resources of Queensland".

Following the first gold rush to Canoona, on the Fitzroy River in 1858, subsequent early gold discoveries in other parts of the Colony had been effective in drawing settlers, so that in the five years preceding 1867 the population of Queensland had trebled to over ninety thousand. In not fulfilling their early promise of richness these finds had, however, contributed little to raising Queensland from its depressed financial condition of the time. This situation changed dramatically in September, 1867, when payable alluvial gold was discovered at the Cape River, and this was soon followed by the rich find of James Nash at Gympie.

Wight's words were certainly timely, but there can be no doubt that the gold discoveries of that year, rather than his address, provided the stimulus for the appointment of professional geologists to work in the Colony. Richard Daintree, who had left the Geological Survey of Victoria in 1864 to settle in north Queensland and enter into pastoral and mining activities, was commissioned by the Government to examine the Cape River area. Subsequently in 1868 Daintree was appointed Government Geologist for the Northern District of Queensland, while Christopher D'Oyly Hale Aplin, also late of the Geological Survey of Victoria, was appointed Government Geologist for the Southern District.

Aplin was born in India, in 1819, the son of an army colonel, and a nephew of Sir James Brooke, Rajah of Sarawak. In 1842, with his brother Dyson, he emigrated from England to Victoria, and the brothers secured pastoral interests in the western districts of the Colony.

Seven years later he left Victoria for Labuan, and was a passenger on the brig *Freak* during the search for traces of the party of explorers left at the Pascoe River by Edmund Kennedy. It is recorded that when the remains of Thomas Wall and Charles Niblet were interred on Albany Island, Aplin read the burial service (Jack, 1922). It was his fate to be buried at the same site sixteen years later. In Labuan, where his uncle was Governor, Aplin held for a time the offices of Collector of Customs and Surveyor-General, and then went to England, where he studied geology under such renowned figures as Sir Charles Lyell and Sir Roderick Murchison.

On his return to Victoria in 1852 he joined his brother on the newly discovered goldfields. His association with the Geological Survey of Victoria began four years later and continued, except for a break during 1865 and 1866, when he entered on a brief career as a consulting geologist, until his appointment to the position in Queensland. Aplin was involved in the preparation of 23 quarter-sheets relating to the Victorian goldfields, and in 1864 he was Acting Director in the absence of A. R. C. Selwyn. His work was apparently regarded highly, and in their biographical sketch Dunn and Mahony (1910) quote words of high praise from Selwyn concerning the efforts of Aplin and G. H. F. Ulrich in connection with the mapping of the Castlemaine quarter-sheet.



CHRISTOPHER D'OYLY HALE APLIN

Aplin came to Queensland at the age of 49 years and an experienced geologist. He shared with Daintree the distinction of founding the Geological Survey of Queensland, although this title was not really applied to the organization until twenty years later. His period of active geological work in Queensland, however, was short—only twenty months. The results of his field work were presented in six published reports :

- (1) Report from the Government Geologist, South Queensland, on the Geological and Mining Features of the Gympie Gold Field. *Legislative Council Journal. Session 1 of 1868*, pp. 449–452 (Dated 2nd July, 1868).
- (2) Report of the Government Geologist of the Southern District. *Votes and Proceedings of the Legislative Assembly for the Session 1868–9*, pp. 605–8 (Dated 23rd October, 1868).
- (3) Report of the Government Geologist, Southern Division, *subtitled* Concluding report of the Government Geologist for the Southern Division, on the examination for gold, of the country south of the Bunya Bunya Range, including some observations on the gold deposits at Jimna and Gooroomjam. *Votes and Proceedings of the Legislative Assembly for the Session 1868–9*, pp. 619–25 (Dated 16th January, 1869).
- (4) Progress Report of the Government Geologist for South Queensland. *Votes and Proceedings of the Legislative Assembly, Session of 1869, 2*, pp. 155–7 (Dated 31st March, 1869).
- (5) Report on the Auriferous Country of the Upper Condamine, Embracing the "Diggings" at Talgai, Thanos Creek, Canal Creek and Lucky Valley. *Votes and Proceedings of the Legislative Assembly, Session of 1869, 2*, pp. 157–164, and map (Dated 21st July, 1869).
- (6) Report on the Geological and Mineral Features of a Part of the Southern and Northern Portions of the Burnett District, by the Government Geologist for South Queensland. *Votes and Proceedings of the Legislative Assembly, First Session of 1870*, pp. 295–301 (Dated 17th January, 1870).

More personal records of his labours are three of his field diaries and some of his fossil collection, which have been located in the Queensland Museum.

In any appreciation of Aplin's geological work in Queensland two things should be borne in mind. Firstly, it was directed towards establishing payable occurrences of gold, and secondly, little previous geological work had been carried out. Some geological observations had been made by the explorers Thomas Mitchell and Ludwig Leichhardt in their overland journeys, and later, between 1853 and 1855, Samuel Stutchbury, official Geologist for the Colony of New South Wales, reported on some aspects of the geology of the country between the southern part of the Darling Downs and the Fitzroy River. W. B. Clarke also briefly examined the Darling Downs in 1853. Following the separation of Queensland from New South Wales in 1859 there was no formal geological work until the commission of Daintree in 1867, although a few geological papers had been read to the Queensland Philosophical Society.

In his notes on the Gympie goldfield Aplin shows how much his interpretation of Queensland geology was to be influenced by his observations in Victoria. He thought the fossils (*Spirifer*, *Productus*, and *Aviculopecten*) were indicative of an Upper Silurian age and likewise saw a resemblance in the character of the reefs. He compared the older alluvia forming the "drift hills" with similar features at Bendigo, and suggested that they should be thoroughly examined.

While the richness of the gold impressed him, he did not favourably regard the prospects of a long life for the field, and in his report warned against the introduction of excessive quantities of machinery. Aplin assumed that the "greenstone", which had been encountered at shallow depth in many of the shafts, constituted an extensive intrusive mass, and the auriferous reefs associated with it would become both less productive and more difficult to exploit in deeper workings. However, even within twelve months of Aplin's report there were more hopeful indications of the persistence of the reefs (Hackett, 1869). Subsequently the Gympie field went on to produce nearly three and a half million ounces of gold in the ensuing 60 years of its existence, and some shafts extended down to over 3,000 feet. It is unfortunate that, in the history of gold-mining at Gympie, Aplin will be remembered chiefly by this early mistake in interpretation; his remarks were no doubt heavily tempered with caution in the light of the available evidence, with the disappointing experiences of earlier Queensland goldrushes prominent in his thoughts.

During the second half of 1868 Aplin examined the gold prospects of the country immediately north-west of Brisbane, along the eastern scarp of the D'Aguilar Range, and across via Kilcoy to the Jimna diggings. He prepared three reports on this work, but there is no evidence that the first was ever published. His diary shows that this report was submitted on 10th August, 1868, and would have dealt with country between Brisbane and Samford, including the Enoggera diggings, near the head of Kedron Brook. Jack (1892) included it in his list of Aplin's published reports, but admitted he had never seen it.

The field notes tell of the desperate efforts of Aplin and his party to discover payable gold along the D'Aguilar Range. Here the unrewarding nature of the work has been borne out by the subsequent history of mining in the area. There were other annoyances apart from the disappointing results of the search for gold. An entry of 28th July records in a forthright manner Aplin's feelings following the inability of Captain Townley of "Sandford" to sell the party salt beef, having no salt, and his refusal to let them have any fat to fry the small quantity of fresh meat he was able to give them. Such were the problems of life in the Queensland bush, with the capital of the Colony only sixteen miles away.

Several weeks were spent in the vicinity of Delaney's Creek and Neurum Neurum Creek, where traces of gold had been reported by Samuel Stutchbury, the Government Geological Surveyor of New South Wales, during his investigations in

1854. Here again the results were disappointing, and in his notes Aplin expressed doubts on the accuracy of some of Stutchbury's observations. His conclusion in his report is worth quoting, "And now I feel confidence in stating that any miner who may be induced by past rumours to prospect these creeks will find his time wasted and his labour thrown away."

The final phase of this programme related to the country around Kilecoy. The field notebook covering this part of the work has not been found, so the information is restricted to Aplin's third published report. The name Bunya Bunya Range, mentioned in the title of this report, referred to what is now known as the Brisbane and Jimna Ranges, and not the Bunya Mountains, north-east of Dalby.

This six months' work was associated with little of real value, although the Jimna and Gooroomjam fields supported a considerable number of miners over the ensuing few years. The survey was essentially a prospecting trip. There had not been sufficient time, in view of the difficult topography and geological complexity of the area, to prepare a geological map. Aplin made the point in his report that the labour would have been more fruitful, if the work of the geologist could have commenced at points where gold mining had been carried out.

This remark may have influenced the authorities at the beginning of 1869 to transfer his activities to the Warwick district, where gold had been worked spasmodically for about five years at Talgai, Canal Creek, Thanes Creek, and Lucky Valley. Six months were spent in the area, and the second and more comprehensive of the two reports emanating from this work constitutes Aplin's most significant contribution to Queensland geology. It was accompanied by a geological map (Plate 14), which also showed the location of the auriferous reefs.

In the western part of this area he divided the altered Palaeozoic sediments into two groups: a lower division, dominantly quartzites, regarded as Lower Silurian in age, and an upper division, slates and sandstones, regarded as Upper Silurian, but did not differentiate between them in the map. The adjacent freshwater Mesozoic sediments, which include some coal measures, were referred to the Carboniferous. Aplin believed in a direct association between mineralization and igneous activity, and considered the Lucky Valley-Elbow Gully area as more favourable for gold mineralization because of the proximity of intrusions. He recorded the occurrence of marine fossils near Elbow Gully and remarked on their similarity to those from Gympie. Sediments in the vicinity, that we now know to be partly Devonian and partly Permian in age, were referred collectively to the Upper Silurian.

On his return to Brisbane in mid-year Aplin had expected the survey to be discontinued, but he received instructions to work in the Peak Downs and Drummond Range areas and to proceed overland so that he could examine the country on the way. However he had travelled only as far north as Gin Gin when the work was terminated at the end of 1869.

On his journey northward he spent a day at Gowrie, collecting fossil bones for the "National Museum". Some of these specimens have been recognised in the collections of the Queensland Museum, and among them one jaw fragment of the large extinct marsupial carnivore, *Thylacoleo carnifex*, has been used in published work on that species.

In his report he provided geological notes of the country along the route, with those relating to the Boyne River headwaters possessing considerable detail. He described the Mount Perry copper lode and recommended deeper sinking to test it more adequately. His brother Dyson joined the party for some of the journey, and Aplin acknowledges his assistance in the field, especially in prospecting. Dyson Aplin had also been at Gympie, during the work there in the previous year, and later, in 1871, he served as Secretary to the Royal Commission on the Queensland Goldfields.

The opinion has been expressed by Bryan (1954) that Aplin's geological work in Queensland was overshadowed by that of his contemporary, Daintree. While this is certainly true, it should be remembered that Daintree's investigations in northern Queensland were of greater duration, and included more areas which developed into significant gold producers. Furthermore, greater travel opportunities enabled Daintree to produce the paper, entitled "Notes on the Geology of the Colony of Queensland", which was presented to the Geological Society of London in 1872, and is regarded as his greatest geological achievement.

Aplin's attitude to his work seems to have been determined by his experience in the Geological Survey of Victoria. He may have been better suited to carrying out more detailed work in restricted areas.

Following the termination of his appointment as Government Geologist for the Southern District, Aplin moved to Maryborough and purchased land for a sugar plantation. From June to September, 1871, he returned to Brisbane to work on the arrangement, labelling and cataloguing of the geological collections of the Queensland Museum, which was then housed in the old Parliamentary Building in Queen Street. This was at the time that control of the Museum was passing from the Queensland Philosophical Society to the Government and the beginning of its development as a public institution. His handwritten palaeontological catalogue of 203 specimens survives to the present day. Most of these fossils had been collected by Aplin and Hackett, a few by Daintree and A. C. Gregory. The bulk of the fossil collection of Daintree had been sent abroad for study by Robert Etheridge, and these specimens were not included in this catalogue, but were added to the Queensland Museum several years later.

Following an unsuccessful approach by Aplin for suitable remuneration for his work, the small vote of £100 for the project having been virtually exhausted on materials, he was asked to hand over the collections to Charles Coxen. This public figure had been largely the driving force in the Queensland Philosophical

Society for the assembly of collections and the foundation of a museum. Aplin then returned to his property Iwood, at Owanyilla, south of Maryborough. He apparently remained unpaid for his services, for a motion that he receive £70 was defeated in the Legislative Assembly in July of the following year.

Little is known of Aplin's activities until he took up his last official appointment, that of Police Magistrate in charge of the settlement of Somerset, near Cape York, some two years later. He was apparently interested in the geology of the newly discovered tin-mining area around Stanthorpe, because T. F. Gregory, a Mineral Land Commissioner, quoted (1873) notes supplied by him on the geology of the country at the head of the Severn River, and the mode of occurrence of the tin. There was something of a lull in official geological work in the Colony, and A. C. Gregory, who was Aplin's successor as Government Geologist for South Queensland, was not appointed until 1875.

Some details of Aplin's tenure of office at Somerset, and his last days, have been provided by Austin (in press). The previous Police Magistrate, G. E. Dalrymple, had relinquished the post because of ill-health, and Aplin took up duty on 26th September, 1874. He died at Somerset less than one year later—on 9th September, 1875, after an illness of about two months. A short obituary appeared in *The Brisbane Courier*, fourteen days after his death. His wife remained in the settlement for a few months and then returned to Brisbane.

The official letters and reports written by Aplin from Somerset relate mainly to the conduct of the small settlement, with its attendant problems of the management of staff and stores, but they also include a substantial report on the pearl fisheries of Torres Strait. There was considerable pearling activity at the time—diving dress was being introduced in these waters, allowing the exploitation of deeper beds—and Aplin submitted some suggestions for possible legislative action to gain the Colony some revenue from the industry. He also recommended Thursday Island as the most suitable site for the new settlement in the area. His name is commemorated locally in Aplin Pass, the strait between Thursday Island and Hammond Island.

If the inscription quoted by Richards and Hedley (1925) is correct, then Aplin has suffered the injustice of having his name misspelt on the tombstone of his grave at the summit of Albany Island, just across the passage from Somerset. It reads

“ CHRISTOPHER HAY D'OYLY APLIN, P.M.,

Government Resident of Somerset,

Formerly Collector of Customs and Surveyor-General of Labuan.

Formerly Government Geologist in Victoria, also in Southern Queensland.

Died 9th September, 1875, aged 56 years.”

So passed from the scene one, who, it cannot be claimed, was a dominating figure, but one whose public service with its several facets is worthy of remembrance.

ACKNOWLEDGEMENTS

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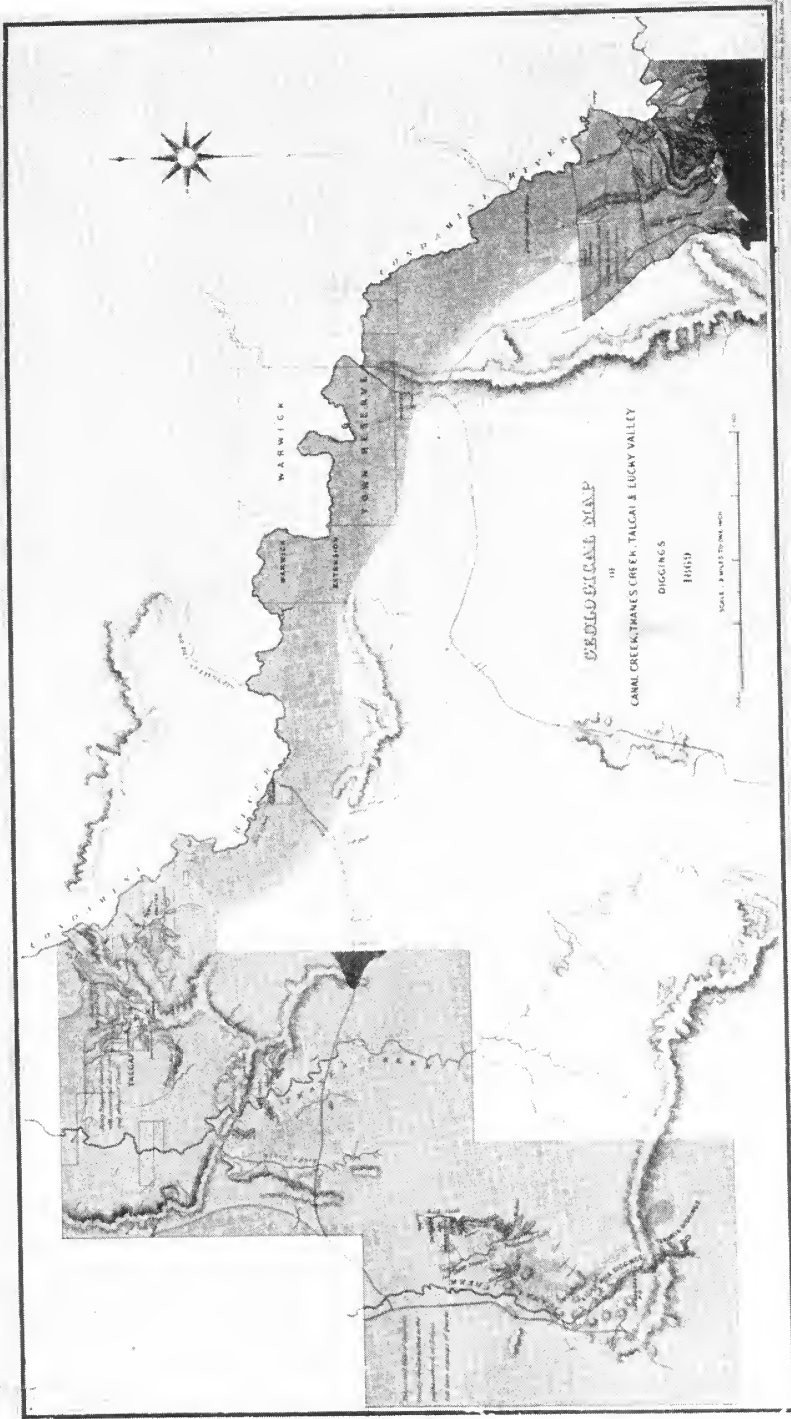
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EXPLANATION OF PLATE XIV

Geological Map of Canal Creek, Thane's Creek, Talgai, and Lucky Valley Diggings. C. D'Oyly H. Aplin, 1869.

GEOLOGICAL SURVEY, Southern District, QUEENSLAND,



Scale 1:100,000
C. De Grey, N.S.W.
1860





