Newberry, Taylor, Skey, and others have conducted experiments for determining the presence of gold, which they had reason to believe was held in solution in the saline waters of the deep mines. Mr. Newberry states that considerable difficulty is experienced in conducting experiments on this subject, as extreme care is requisite to exclude all possible chance of the presence of finely-divided gold, which has been held in mine-waters either by itself or with pyrites, quartz, and earthy matter. With such precautions Mr. Newberry admits that a portion of the evidence had to be discarded, and the final results were not deemed to be conclusive on the point. Much investigation is yet necessary before we can arrive at final conclusions respecting the origin of gold in quartz veins.

In this place it is of interest to observe that Sir R. Murchison's settled opinion of the "downward impoverishment of gold-bearing quartz veins" has not been sustained by practical experience in Australia, where gold is now successfully worked in many places over 2,000 feet below the surface, and in one place at 2,409 feet, or nearly half-a-mile deep. His peculiar views with respect to the superficial distribution of gold, and of the downward persistence of silver, were no doubt coloured to a great extent by the idea that the sacred writer of Job[a] indicated such a form of distribution as regards gold and silver, in the aphorism—

"Surely there is a *vein* for the silver. . . . The earth hath *dust of gold*."

His fears for the ultimate failure of the gold supply were therefore unnecessarily increased.

NOTES AND DESCRIPTIONS OF CRINOIDEA FROM THE UPPER PALÆOZOIC ROCKS OF TASMANIA.

By Robt. M. Johnston, F.L.S.

ENCRINITE STEMS FROM PACHYDOMUS BEDS, DARLINGTON, MARIA ISLAND.

I have recently examined a very interesting collection of articulated encrinite stems, variously sculptured, obtained by Mr. Perrin. The inside casts of similar forms are also of common occurrence in the Porter Hill and Shot Tower beds. In the Darlington specimens, however, the external sculpture is exhibited in great perfection. As these forms may be of service in matters relating to the correlation of the various divisions of the Upper Palæozoic rocks, I have taken pains

to figure the more characteristic examples of these curious jointed stems. It is somewhat interesting to observe that all the varieties of stems have branching whorls (generally five) at regular intervals, with an occasional one or two odd "auxiliary arms" springing irregularly from the axis between the regular whorls. The three variously sculptured varieties may belong to different parts of the column or its auxiliary arms. The calyx of these stems has not yet been observed.

No. 1 represents a large round stem composed of articulated joints of an irregularly moniliform character; joints from about 12 to 15 millimetres in diameter; articulating surfaces, marked with fine radiating striæ near the margin; surface of stem ornamented with somewhat distant, raised annular ribs or nodes, each about 5 to 6 millimetres apart, the flattened and constricted interspaces with 5 or 6 annular liræ, a large and small one usually alternating. At regular intervals, about every fifth of the larger annular nodes, there is a still larger node, from which five "auxiliary arms" radiate outwards and upwards. The node is somewhat swollen at the junction of each auxiliary. The whole of the surface rings on some of the specimens seem to be crossed by very fine oblique striæ, giving them a granular appearance. The different parts of the stem, however, show great variation in sculpture, although preserving the general moniliform character. In parts of about 10 millimetres in diameter the nodes are less distant, and the intervening annular liræ are fewer and relatively coarser. The "alimentary canal" is central, conspicuous, though ill-defined. There is an appearance of a pentagonal form in some sections of the alimentary canal.

No. 2 is a stem composed of simple, regular ovate joints, generally more flattened on one side than on the other. Each joint is regularly divided by a well-marked suture about 3 millimetres apart, sometimes showing the crenulated edges of the striæ marking the articulating surfaces; the surface of each ring is simple and flatly rounded. Alimentary canal exceedingly fine, sub-central; articulating surface ornamented with fine striæ, longest and most marked on the side most distant from canal. At distant intervals there is a joint somewhat larger, carrying two auxiliary arms. This joint is divided in the middle by a very fine annular suture, which is well marked in the junction scar of auxiliary branch. Greatest diameter, 12 to 13 millimetres; smallest diameter, 7 millimetres.

No. 3 is a simple stem like No. 2, but smaller and more rounded. From a polished section, however, it is clear that in the earlier stage of growth it was somewhat oval and more flattened on one side, like No. 2, and that the alimentary

canal is sub-central. There appears to be excentric rings of growth almost wholly confined to the side furthest from axis of alimentary canal, which can with difficulty be traced. The joint carrying auxiliary arms has the same character as No. 2, but there are either four or five "auxiliary arms," and in one specimen there is a solitary auxiliary placed lower upon an ordinary joint. Greatest diameter, 8 millimetres; least, 7 millimetres; distance of annular sutures apart, 2 millimetres.

No. 4 is, no doubt, the extreme portions of auxiliary arms probably of either No. 2 or 3, composed of fine, simple, rounded moniliform joints, about $1\frac{1}{2}$ millimetres in diameter, gradually tapering.

Tribrachyocrinus Tasmanicus? Nov. sp.

Perforation of large pentagonal tripartite pelvis or dorsocentral plate exceedingly minute, apparently absent; costal plates large, roundly pentagonal; one plate (first costal) irregularly hexagonal; margins of plates marked with fine parallel concentric striæ. Specimen much distorted, having a broadly oval form. Length, 3 inches; width, 2 inches.

Associated with *Spirifera convoluta*, *Sanguinolites Etheridgei*, etc., in Upper Palæozoic mudstone cliffs at Shot Tower, Brown's River-road.

Specimen obtained by Mr. A. Morton, Curator of Tasmanian Museum, from the collector, Mr. Harrison. The above species comes very close to, and perhaps may not be specifically distinct from, the smaller form with large perforation in tripartite pelvis described by Prof. M'Coy as *T. Clarkei*, from the soft grey shales of Darlington, N.S.W.

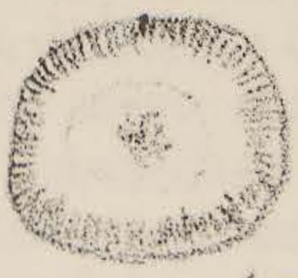
NOTES ON FOSSIL CRABS FROM THE DEEP DREDGINGS OF THE YARRA RIVER, AND EXCAVATION OF THE COODE CANAL, VICTORIA.

By S. H. Wintle, F.L.S., &c.

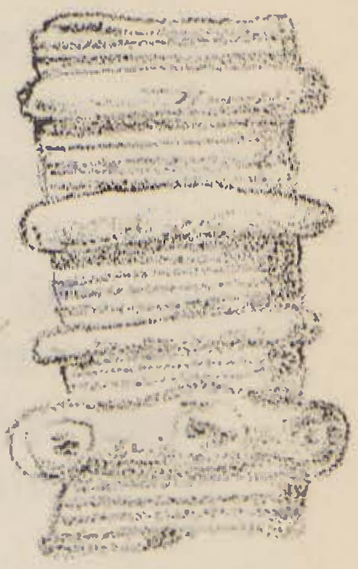
The accompanying fossil crustacea I obtained from the deposits of deep dredgings of the Yarra river, and from the material deposited from the excavation of the Coode Canal. The age of the old Estuarine bed which supplied them is Post Pliocene. These cancerolites belong to the Genera

1

1d



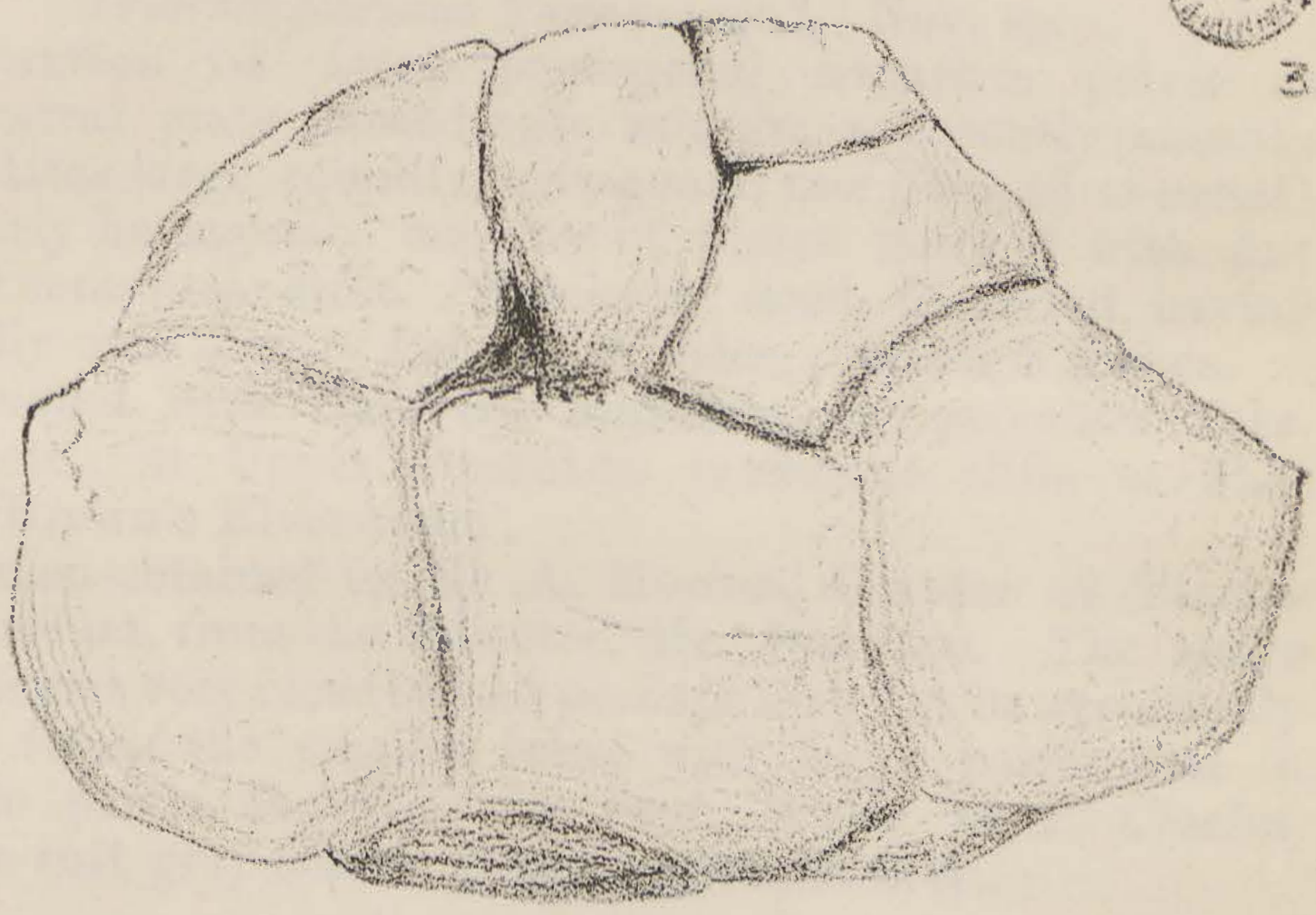
1e



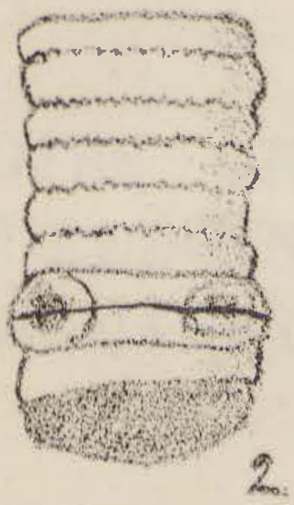
1a

2b

3a



Tribrachiocrinus Tasmanicus R.M. Johnston.



2

2c

2b

3

1b

TASMANIAN CRINOIDEA.