

that *P. bivaricosus*, and the other species, herein touched on, do not resemble any of the *Bulimi* of New Guinea so far as known.

Placostylus is not known to occur on Norfolk Island; and considering the position of the latter between New Zealand, Lord Howe Island, and New Caledonia, with the numerical preponderance of *Placostylus* where it is found, we are afforded further food for reflection on this important subject.

It is interesting to note that the geological occurrence of *P. senilis*, Gassies, in the Isle of Pines and Koutoumo Island, New Caledonia, is very similar to that of var. *senilis* at Lord Howe Island, in a sand-rock overlying an upheaved coral reef, and inferior to the present surface soil of the islands.*

In the course of these investigations I have been assisted with several important suggestions by Messrs. J. Brazier and C. Hedley, which have led up to the views enunciated.

THE LAND AND FRESH-WATER SHELLS OF LORD HOWE ISLAND.

BY C. HEDLEY, F.L.S.

(Plates xxi. - xxii.)

IN the Memoirs of the Australian Museum, No. 2, "Lord Howe Island," a sketch will be found on pp. 22 - 30 of the molluscan fauna of the island, illustrated by plates 4 and 5, which were, by an unfortunate accident, reversed. Stress of professional duties has prevented Mr. Brazier from completing this outline by detailed descriptions of the species there enumerated, and, greatly to the disadvantage of conchological science, that portion of the work dealing with fluviatile and terrestrial shells is now undertaken by the present writer.

On glancing over the species inhabiting the island, the most noticeable feature is that they are all endemic, while the absence of ubiquitous species like the *Truncatellæ* indicate that further search would augment the roll. To the eye of an Australian student the types are unfamiliar, and old acquaintances are conspicuous by their absence. Here, the operculates are largely represented, in Australia they are a foreign intrusive element confined to the north-east border, where they increase with every degree of latitude as Torres Straits are approached. Neither are

* Gassies, *loc. cit.*, Pt. ii., p. 67.

the characteristic Queensland operculates, *Pupina* and *Helicina*, present. Among the inoperculates the *Placostylus* claims affinity with the New Zealand and New Caledonian forms, and utterly repudiates kinship with Australian life.

1. NANINA SOPHIÆ, *Gaskoin*, 1854.

Illustrations. Reeve, *Conch. Icon.* vii., pl. 196, fig. 1377; Cox, P.L.S., N.S.W., ser. 2, Vol. ii., pl. 20, figs. 8, 9; Tryon, *Man. Conch.* ser. 2, Vol. ii., pl. 16, fig. 26.

Descriptions. Gaskoin, P.Z.S., 1854, p. 152; Pfr., *Mon. Hel. Viv.*, Vol. iv., p. 59; Tryon, *Man. Conch.*, 2-2-83.

Type. British Museum. (?)

Hab. The lower and wooded portions of the island, where it is plentiful.

var. CONICA, *Brazier*, 1889.

Illustration. Brazier, *Aust. Mus. Mem.*, 2, pp. 26, 29, pl. 5, figs. 5, 6, (reversed).

Type. Australian Museum.

Hab. Rabbit Island; plentiful under stones.

Shell smaller and more elevated than the type, globosely conical, scarcely perforate, base rounded. Diam. maj. 25, min. 23, alt. 19 mill. Jaw (pl. xxi., fig. 3) lunate, with central rostriform limb, smooth, ends rounded. Radula (pl. xxii., fig. 7) tongue-shaped, three times as long as broad; formula, 140 rows of 70 : 26 : 1 : 26 : 70; the rows are nearly straight in the centre of the ribbon, the laterals curving back slightly from the centre, after the transition teeth are passed the marginals sweep back in a parabolic curve; the rachidian possesses a slender lanciform cusp whose apex barely surpasses the basal plate, at one-third of its length it is furnished with two small auxiliary cusps; the laterals are slightly larger than the rachidian and equal each other in size, alate angle of basal plate hardly expanded, the inner accessory cusp is suppressed and the main cusp just surpasses the base of attachment; the marginals succeed three or four transition teeth, they are minute, diminishing rapidly, cusp bicapitate, base bisinuate.

2. N. HOWINSULÆ, *Cox*, 1873.

Illustration. Cox, P.L.S., N.S.W., ser. 2, Vol. iv., pl. 19, figs. 10, 11.

Descriptions. Cox, P.Z.S., 1873, p. 140; Pfr., *Mon. Hel. Viv.*, Vol. vii., p. 205.

Type. The original of the description is in the Cox Collection, that of the figure in the Australian Museum.

Hab. Replaces the preceding species on the summit of the mountains.

Jaw (pl. xxi., fig. 7) lunate, with stout central rostriform projection, smooth, ends square. Radula (pl. xxii., fig. 8) tongue-shaped, twice as long as broad; formula, 120 rows of 90:24:1:24:90; rachidian with a slender lance-shaped median cusp, whose cutting point projects beyond the basal plate, bearing two small auxiliary cusps half-way along the reflection; the laterals resemble it, except that the outer auxiliary cusp only is developed, alate margin of the basal plate rounded; the numerous marginals succeed after one or two transition teeth, and are slender, minute, oblique and bicuspidate. The genital system is figured on pl. xxii., fig. 5. The spirit specimens before me exhibit a pedal line, well developed caudal mucous pore and mantle lobes.*

3. N. HILLI, Cox, 1873.

Illustrations. Cox, P.Z.S., 1873, pl. 16, figs. 7a, 7b; Tryon, Man. Conch., ser. 2, Vol. i., pl. 38, figs. 57, 58.

Descriptions. Cox, P.Z.S., 1873, p. 151; Pfr., Mon. Hel. Viv., Vol. vii., p. 26; Tryon, Man. Conch. 2-1-170.

Type. The Cox Collection.

Hab. The summit of Mount Gower.

Jaw (pl. xxii., fig. 6) lunate with median projection, smooth, ends rounded. Radula (pl. xxii., fig. 2) somewhat wedge-shaped, almost as broad as long; formula, 163 rows of 430:24:1:24:430; save that the main cusps appear rather longer and more slender and project further past the basal margin, the structure of the teeth is the same as described for the two preceding species; the feature of the membrane being the excessive number of minute marginals.

Sophia, *howinsula* and *hilli* are allied species, and are rather too dissimilar to the type of *Helicarion* to be admitted into that genus. Much critical examination of the *Naninidae* of the South Seas remains to be done before the genera of that family can be suitably defined. The species in question are probably allied to the Fijian *godeffroyi* and to the Papuan *hunsteini*, I prefer to leave them at present under *Nanina*, using the name in its widest significance.

4. PARMELLA ETHERIDGEI, Brazier, 1889.

Illustrations. Brazier, Aust. Mus. Mem. 2, pl. 5, fig. 9 (reversed); Hedley, Records of the Australian Museum, Vol. i., pl. 11 (reversed).

* Since the above was in type I have learnt from Prof. H. A. Pilsbry, of Philadelphia, that he has simultaneously with myself, examined the anatomy of *N. howinsula*, and that he has independently arrived at the same conclusions regarding its systematic position. His observations will probably appear about the time of the issue of this paper.

Descriptions. A.M.M., pp. 26, 30 ; R.A.M., Vol. i., pp. 78-80.

Type. Australian Museum.

Hab. On palms at the lower levels below 400 ft.

Jaw (pl. xxii., fig. 4) small, rudimentary, thin, transparent, lunate, emarginate on anterior margin, with slight median projection on lower margin, ends rounded. Larger specimens are contained in the collection than the one described in the 'Records,' one measures 27 mill. in length.

5. *MICROCYSTIS CATLETTI*, *Brazier*, 1872.

(Plate xxi., fig. 5.)

Descriptions. *Brazier*, P.Z.S., 1872, p. 617 ; *Pfr.*, Mon. Hel. Viv., Vol. vii., p. 61 ; *Brazier*, Aust. Mus. Mem. 2, pp. 26, 29.

Type. Australian Museum.

Hab. Rabbit Island.

var. MAJOR, *nov. var.*

Larger than type, columellar margin furnished with a tubercle. Diam. maj. 11, min. 10, alt. 6 mill.

Type. Australian Museum.

Hab. The Old Settlement.

6. *CHAROPA TEXTRIX*, *Pfeiffer*, 1855.

Illustrations. *Küster's Conch. Cab.* pl. 162, figs. 14-17 ; *Tryon*, Man. Conch. ser. 2, Vol. iii., pl. 7, figs. 2-4.

Descriptions. *Pfr.*, P.Z.S., 1855, p. 92 ; *Pfr.*, Mon. Hel. Viv., Vol. iv., p. 87 ; *Tryon*, Man. Conch. 2-3-35 ; *Brazier*, Aust. Mus. Mem. 2, pp. 26, 30.

Type. British Museum.

Hab. The summit of Mount Gower.

H. pinicola, *Pfr.*, from the Isle of Pines, a dependency of New Caledonia, is a near ally of the preceding species, and supports the argument advanced under the head of *P. bivaricosus* on behalf of a recent land connection with New Caledonia. It is incorrectly (*Mon. Hel. Viv.*, Vol. iv., p. 106) stated to inhabit Lord Howe.

7. *C. CIMEX*, *Pfeiffer*, 1854.

Illustrations. *Reeve*, Conch. Icon. vii., pl. 201, fig. 1411 ; *Tryon*, Man. Conch., ser. 2, Vol. 3, pl. 52, fig. 4.

Descriptions. *Pfr.*, P.Z.S., 1854, p. 288 ; *Pfr.*, Mon. Hel. Viv., Vol. iv., p. 104 ; *Tryon*, Man. Conch. 2-2-170 ; *Brazier*, Aust. Mus. Mem. 2, pp. 26, 30.

Type. British Museum.

Hab. Lord Howe. (?)

8. C. (?) *IGNAVA*, Pfeiffer, 1855.

Descriptions. Pfr., P.Z.S., 1855, p. 92; Pfr., Mon. Hel. Viv., Vol. iv., p. 98.

Type. British Museum.

Hab. Lord Howe. (?)

9. C. (?) *CÆCILIA*, Pfeiffer, 1855.

Descriptions. Pfr., P.Z.S., 1855, p. 92; Pfr., Mon. Hel. Viv., Vol. iv., p. 107.

Type. British Museum.

Hab. Lord Howe. (?)

More evidence is required before *cimeax*, *ignava*, and *cæcilia* can be recognised as members of this fauna.

10. C. *WILKINSONI*, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 5, figs. 4, 5, (reversed).

Type. Australian Museum.

Shell small, discoidal, obtusely carinate, thin, translucent, colour pale yellow alternating with red radiating dashes; whorls $4\frac{1}{2}$, convex, slowly increasing; sculpture fine regular microscopic costæ decussated by similar spiral lyræ; suture impressed; spire plane; umbilicus wide, one-third of diameter; aperture vertical, ovate lunate, peristome sharp, thin. Diam. maj. $2\frac{1}{2}$, min. 2, alt. 1 mill.

Hab. Between the North Ridge and Old Settlement.

11. C. *UNWINI*, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 4, figs. 5, 6, (reversed).

Type. Australian Museum.

Shell small, depressed, thin, translucent, umbilicate; colour uniform pale yellow; whorls four, rounded, gradually increasing; sculpture oblique radiate striæ; spire slightly elevated, apex obtuse; suture impressed; umbilicus wide, one-third of diameter, deep, perspective; aperture not descending, roundly lunate, peristome thin, straight. Diam. maj. $2\frac{1}{2}$, min. 2, alt. $1\frac{1}{2}$ mill.

Hab. The low grounds at the north end of the island.

12. *PATULA WHITELEGGEI*, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 4, figs. 23, 24, 25, (reversed).

Type. Australian Museum.

Shell discoidal umbilicate, thin, translucent; colour chestnut painted with zig-zag straw flames, interior subnacreous with a

bluish lustre; whorls $3\frac{1}{2}$, rapidly increasing, flattened between the periphery and the suture, subangled at the periphery, slightly descending at the aperture; sculpture numerous irregular oblique sinuate sharp costæ which are smaller and closer on the last whorl, in their interstices and parallel to them are close fine hair lines, there is a decided break in the sculpture on reaching the embryonic whorls which faintly repeat the adult sculpture; suture deep, acutely impressed; spire sunk, embryonic whorls $1\frac{1}{2}$, distinct; epidermis glistening; base rather flattened, umbilicus about one-sixth of major diameter, perspectively exhibiting all the earlier whorls; aperture diagonal, peristome straight, sharp, body whorl overlaid by a thin callus. Diam. maj. 16, min. 13, alt. 6 mill.

Hab. Summit of Mount Ledgbird.

Jaw (pl. xxi., fig. 6) thin membranous, emarginate on the convex margin, projecting on the concave, ends angled, finely transversely striate. Radula (pl. xxii., fig. 1) small, strap shaped, three mill. long by one broad, rows curving slowly backward (posteriorly with relation to the animal), till the marginals are reached, when they run straight across the ribbon until the extreme marginals which sweep slightly forwards; formula, 150 rows of 21 : 10 : 1 : 10 : 21; the rachidian is small, two-thirds the size of the immediate laterals, cusp ovate, extending along three-fourths of the basal plate and bearing at half its length two minute accessory cusps; the cusps of the laterals increase in magnitude as they retreat from the centre, and are supplied with both distal and proximal accessory cusps, the main cusps of the inner laterals fall short of, and those of the outer exceed, their basal plates, whose alate angle is scarcely expanded; the outer four laterals are modified by transition to the marginal type, whose proximal accessory cusp assumes a sabre shape, and increases to nearly the size of the main cusp, the extreme marginals offer a short tridentate blade. The shell of this species resembles that of *R. sinclairi*, of Tasmania, and before examining the unexpected dentition, I quite concurred with Mr. Brazier in referring this species to *Rhytida*.

var. BALLI, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 4, figs. 13, 14, 26, (reversed).

Type. Australian Museum.

Shell depressedly globose, often eroded, whorls rounded, spire slightly raised, base rounded, umbilicus narrow but exhibiting the previous volutions. Diam. maj. 11, min. 10, alt. 6 mill.

Hab. Summit of Mount Ledgbird.

var. LEDGBIRDI, Brazier, 1889.

Illustration. Brazier, Aus. Mus. Mem. 2, pl. 4, figs. 19, 20 (reversed).

Type. Australian Museum.

Shell globosely conoid, whorls rounded, spire elevated, base rounded, aperture subcircular, umbilicus narrow. Diam. maj. 8, min. 7, alt. 6, mill.

Hab. The western flanks of Mount Ledgbird.

The two latter forms are considered by Mr. Brazier to be species, an opinion from which I differ with much reluctance.

13. PLACOSTYLUS BIVARICOSUS, Gaskoin, 1854.

Illustrations. Gaskoin, P.Z.S., 1854, pl. 29, figs. 4, 5; Gassies, Faune conchyliologique de la Nouvelle Calédonie. pl. 3, fig. 2.

Descriptions. Gaskoin, P.Z.S., 1854, p. 152; Gassies, Faune conch. de N. Cal., p. 47; Pfr., Mon. Hel. Viv., Vol. iv., p. 447; Crosse, Journ. de Conch. 1864, p. 128; Brazier, Aust. Mus. Mem. 2, p. 27.

Type. British Museum (?)

Hab. All over the island in sheltered places under stones; abundant.

The auriculoid *Bulimi* form so natural a group, limited in geographical range, bearing a most characteristic shell and sharply defined by its dentition from the typical *Bulimi* that it appears more convenient to accord *Placostylus* specific rank than to reduce it as in Fischer's Manual to a section of *Bulimulus*. This species speaks eloquently of a recent land connection extending on the one side to New Caledonia and on the other to New Zealand. It is confined to Lord Howe Island and, the Loyalty Island habitat quoted by Crosse is erroneous. This shell is as variable as any of its polymorphic genus; were the extreme forms only available for study, two recent and another extinct species would be recognised by all schools of conchologists.

Jaw (pl. xxi., fig. 4) folded, kidney-shaped, thin, membranous, margins recurved, ends angled, folds asymmetrical, about 14 on each side, oblique, enclosing a triangular median space, scarcely denticulating either margin. Radula (pl. xxii., fig. 3) tongue shaped three times as long as broad; formula, 127 rows of 35 : 22 : 1 : 22 : 35; rachidian furnished with a slender median lance cusp whose cutting point projects beyond the basal plate, half way along the reflection are seated two small auxiliary cusps; the lateral main cusp is ovate, stouter and blunter than that of the rachidian and also surpasses the posterior margin of the basal plate, the inner auxiliary cusp is suppressed and the outer increased, the alate margin of the basal plate is almost falcate; the laterals pass gradually into the marginals whose main cusp diminishes and becomes double headed.

These observations agree with those of Fischer on *P. porphyrostomus* and *P. scarabus*, Journ. de Conch., 1871, Vol. xix., pp.

161 - 166, pl. 7, and with those of Hutton on *P. bovinus*, Trans. N. Z. Institute, 1881, Vol. xiv., p. 152, pl. 3, figs. d. o.

var. CUNICULINSULÆ, Cox, 1872.

Illustration. Cox, P.Z.S., 1872. pl. 4, fig. 3.

Description. Op. cit., p. 19; Brazier, Aust. Mus. Mem. 2, p. 27.

Type. The Cox Collection

Hab. Rabbit Island.

A local race from a satellite isle, differing in being rather smaller thinner and narrower than the type; the rimation upon which the author lays stress, appears of slight importance since all *Placostyli* possess or lack it indifferently.

var. ETHERIDGEI, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 5, figs. 1, 2, 7, 8 (reversed).

Type. Australian Museum.

A large thin elongate form, exhibiting transverse malleated furrows, on the last whorl the epidermis is nearly black, the bright cherry red of the typical aperture has almost disappeared, only the columellar plication retaining a trace, the nacreous lining of the interior and the callus on the body-whorl are tinged a greenish-blue. Length 65, breadth 27, length of aperture 30, breadth of aperture 20 mill.

Hab. Under the wall of Mount Ledgbird.

Several recent specimens approach the interesting fossil variety *solidus* which is exhaustively described by Mr. Etheridge in an accompanying paper. All the dominant forms of Lord Howe possess that instability of character which seems inherent in insular faunæ.

14. *SIMPULOSIS (?) MASTERSI, Brazier, 1872.*

(Plate xxi., fig. 9.)

Description. Brazier, P.Z.S., 1872, p. 619; Pfr., Mon. Hel. Viv., Vol. vii., p. 29; Brazier, Aust. Mus. Mem. 2, p. 27.

Type. Australian Museum.

Hab. A gully on the North Ridge, among dead leaves; rare.

The animal of the single specimen procured by the expedition is so shrunk by the action of the alcohol in which it is preserved, that I am unable, even with the aid of the microscope, to determine any details of its external anatomy, and I do not feel justified in dissecting the solitary example possessed by the Museum. Except by adding a figure of the shell I cannot therefore increase our knowledge of this obscure form.

15. *TORNATELLINA INCONSPICUA*, *Brazier*, 1872.

Description. Brazier, P.Z.S., 1872, p. 619; Pfeiffer, Mon. Hel. Viv., Vol. viii., p. 319; Aust. Mus. Mem. 2, p. 27.

Type. Was deposited in the Australian Museum, but has been accidentally destroyed.

Hab. A gully on the North Ridge, among dead leaves; rare.

The broken shell collected by the expedition is too incomplete to figure, which is to be regretted, as no illustration has been published.

16. *DIPLOMMATINA MACGILLIVRAYI*, *Pfeiffer*, 1854.

(Plate xxi., fig. 1.)

Descriptions. Pfr., P.Z.S., 1854, p. 303; Pfr., Mon. Pneu. Viv., Vol. ii., p. 11; Brazier, Aust. Mus. Mem. 2, p. 27.

Type. British Museum.

Hab. The Old Settlement, among dead leaves on the ground and under stones, abundant.

var. BETA, *Pfeiffer*, 1854.

A slight colour variation possessing a peripheral band shown in my illustration.

17. *D. CAPILLACEA*, *Pfeiffer*, 1854.

(Plate xxi., fig. 2.)

Descriptions. Pfr., P.Z.S., 1854, p. 303; Pfr., Mon. Pneu. Viv., Vol. ii., p. 12; Brazier, Aust. Mus. Mem. 2, p. 27.

Type. British Museum.

Of the smaller *Diplommatina* I have three lots before me, No. 1, collected by Mr. Masters on Lord Howe, from which the example figured was selected; No. 2, collected by the expedition on Lord Howe; No. 3, collected by the expedition on Rabbit Island. These range in length from $3\frac{1}{2}$ (No. 1) to $4\frac{1}{2}$ mill. (No. 2) in length. Some individuals are more closely costulate than others, sometimes the ultimate, sometimes the penultimate whorl is the most densely ribbed; the coloration varies from light yellow to pale purple, and some specimens are considerably narrower than others. Though none correspond to Pfeiffer's description of *chordata*, this instability of character inclines me to suppose that a larger collection from different parts of the island would supply links to connect that species with *capillacea*. Indeed the large form *macgillivrayi* may also prove but an extreme variation of the same type.*

* Dr. Macdonald has figured (*Ann. Mag. Nat. Hist.* (4), iv. pl. 4, fig. 9) the radula of one of the Lord Howe *Diplommatinae*, which one he does not say.

18. *D. CHORDATA*, Pfeiffer, var. BETA, Pfr., 1855.

Descriptions. Pfr., P.Z.S., 1855, p. 105; Pfr., Mon. Pneu. Viv., Vol. ii., p. 13; Hutton, Manual N. Z. Mollusca, p. 38; Hutton, Trans. N.Z. Institute, 1883, Vol. xvi., p. 210.

Type. British Museum.

Hab. Lord Howe Island.

The type was originally reported from New Zealand, but modern collectors have not confirmed the statement.

19. *D. CANTORI*, Pfeiffer, 1856.

Descriptions. Pfr., P.Z.S., 1856, p. 336; Pfr., Mon. Pneu. Viv., Vol. ii., p. 12.

Type. British Museum.

Hab. Lord Howe Island.

I have no knowledge of this species.

20. *OMPHALOTROPIS PFEIFFERI*, Crosse, 1868.

Illustration. Crosse, Journ. de Conch., Vol. xvii., 1869, pl. 12, figs. 7, 7.

Description. Op. cit. Vol. xvi., p. 178; Pfr., Mon. Pneu. Viv., Vol. iv., p. 226; Brazier, Aust. Mus. Mem. 2, p. 30.

Type. Crosse's Collection.

Hab. On leaves of trees and on palm fronds, very plentiful.

21. *REALIA EXQUISITA*, Pfeiffer, 1854.

(Plate xxi., fig. 8.)

Descriptions. Pfr., P.Z.S., 1854, p. 307; Pfr., Mon. Pneu. Viv., Vol. ii., p. 162.

Type. British Museum.

Hab. Lord Howe Island.

This is the *Realia* to which allusion is made on p. 27 of "Lord Howe Island." Mr. Brazier informs me that *Hydrocena acutivirata*, Pfr., and *Helicina zebriolata*, Pfr. are natives of the New Hebrides, and were wrongly assigned to Lord Howe Island. The error probably originated with Cuming who confused the localities furnished by MacGillivray.

22. *BYTHINELLA WHITELEGGEI*, Brazier, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 4, figs. 17, 18, (reversed).

Type. Australian Museum.

Shell elliptical, subcylindrical, perforate; colour, the two latter whorls pale yellow, the former purple; whorls $4\frac{1}{2}$, flattened, angled below the suture, the last exceeding the rest in length; sculpture, last whorl encircled by five, the penultimate by three, wide flat-topped lyræ, crossed longitudinally by fine striæ; suture impressed; umbilical chink oblique, narrow; spire obtuse; peristome free, entire, ovate, expanded. Length $2\frac{1}{2}$, breadth 1 mill.

Hab. The creek to the north of the Old Settlement.

23. B. RAMSAY, *Brazier*, 1889.

Illustration. Brazier, Aust. Mus. Mem. 2, pl. 4, figs. 15, 16, (reversed).

Type. Australian Museum.

Shell narrowly ovate, perforate; colour corneous; whorls $4\frac{1}{2}$, convex, the last two-thirds of the total length; sculpture faint oblique striæ; suture impressed; spire obtuse; umbilical chink narrow oblique; aperture obliquely ovate, effuse below, angled above, peristome entire, slightly expanded and reflected. Length 4, breadth 2 mill.

Hab. Running streams on the eastern flanks of Mt. Ledgbird.

ON THE ORGANISM DISCOLOURING THE WATERS OF PORT JACKSON.

BY THOS. WHITELEGGE.

[THE following report on the discolouration of the waters of the harbour has been prepared by authority of the Trustees of the Australian Museum, at the request of the Commissioners of Fisheries for New South Wales.

It is a preliminary report, and has already appeared in some of the Sydney daily papers. Mr. Whitelegge is still engaged in the investigation, and in the preparation of a paper on the subject.—ED.]

Australian Museum, 13th April, 1891.

To Dr. E. P. Ramsay, F.R.S., E., Curator.

Sir,—I have the honour to report that, in accordance with your instructions, I have visited various parts of the harbour, with the view of ascertaining the probable effects of the Peridinium