

NOTES ON THE ZOOLOGY OF PAANOPA OR OCEAN ISLAND
AND NAURU OR PLEASANT ISLAND, GILBERT
GROUP.

The material described in the following pages was either collected for, or presented to the Trustees by Messrs. F. Danvers Power and A. E. Stephen, who visited Ocean and Pleasant Islands on behalf of the Pacific Islands Co., Ltd., of this City. R. E.

THE BIRDS.

By ALFRED J. NORTH, Ornithologist

Only five spirit specimens were obtained, referable to the following four species:—

ACROCEPHALUS REHSEI, *Finsch.*

Rehse's Reed Warbler.

Calamoherpe syrinx (*non* Kittl.), Finsch, Ibis, 1881, p. 246.

Calamoherpe rehsei, Finsch, Ibis, 1883, p. 143.

Tatare rehsei, Sharpe, Brit. Mus. Cat., Bds., vii., 1883, p. 528.

Two specimens. Dr. O. Finsch, who visited Pleasant Island on the 24th July, 1880, and was the first naturalist to land on its shores, gives an interesting account of this species in his "Letters from the Pacific," published in "The Ibis" in the following year. It is known in the Island by the Mauru native name of Tereet.

TOTANUS INCANUS, *Vieill.**Grey-rumped Sandpiper.*

Totanus incanus, Vieill., Nouv. Dict. Hist. Nat., vi., 1816, p. 400.
Heteractitis incanus, Sharpe, Brit. Mus. Cat., Bds., xxiv., 1896,
 p. 453.

A single specimen. Nauru native name Tekr (A) ret.

MICRANOUS LEUCOCAPILLUS, *Gould.**White-capped Noddy.*

Anous leucocapillus, Gould, Proc. Zool. Soc., 1845, p. 103.
Micranous leucocapillus, Saunders, Brit. Mus. Cat., Bds., xxv.,
 1896, p. 145.

One specimen. Nauru native name Teror.

GYGIS CANDIDA, *Gmelin.**White Tern.*

Sterna candida, Gmel., Syst. Nat., i., 1788, p. 607.
Gygis candida, Saunders, Brit. Mus. Cat., Bds., xxv., 1896, p. 149

One specimen. Nauru native name Te gigea.

 THE REPTILES.

By EDGAR R. WAITE, F.L.S., Zoologist.

Three species of Lizards were obtained, all known from neighbouring islands, they are:—

Gehyra oceanica, Lesson.—Ocean Island.

Lygosoma cyanurum, Lesson.—Pleasant and Ocean Islands.

Lygosoma atrocostatum, Lesson.—Pleasant Island.

 THE FISHES.

By EDGAR R. WAITE, F.L.S., Zoologist.

Gauged by the small number of species placed in our hands, no serious effort seems to have been made to collect the fishes of the islands. Those obtained, as would be expected, are common to many of the Polynesian Islands, and are interesting as extending the known habitats of the species, and being, as far as I am aware, the only specimens recorded from the islands.

As both Pleasant and Ocean Islands are purely oceanic, their fauna may not be so rich as those of a group, as, for example, the Marshall and the Gilbert Groups, to which, politically, the islands are respectively attached.

PLEASANT ISLAND, (*Nauru*.)

Gymnothorax pictus, Ahl.
Fistularia depressa, Günther.
Mulloides samoensis, Günther.
Caranx hippos, Linnæus. (Regarded as poisonous at times!)
Anthias pleurotania, Bleeker.
Cirrhitus maculatus, Lacépède.
Glyphidodon brownriggii, Bennett.
Thalassoma purpurea, Forskal.
Thalassoma melanochir, Bleeker.
Teuthis lineatus, Linnæus.
Teuthis triostegus, Linnæus.
Naseus unicornis, Forskal.
Salarias periophthalmus, Cuvier and Valenciennes.
Rhomboidichthys pantherinus, Rüppell.

OCEAN ISLAND, (*Paanopa*.)

Gymnothorax flavomarginatus, Rüppell.
Gymnothorax tessellatus, Richardson.
Tylosurus platurus, Rüppell (? = *Belone depressa* Günther).
Fistularia depressa, Günther.
Holocentrus erythreus, Günther. (Native name *Te breno*).
Promethichthys prometheus, Cuvier and Valenciennes.
Caranx hippos, Linnæus.
Kuhlia taniura, Cuvier and Valenciennes.
Epinephelus merra, Bloch.
Teuthis triostegus, Linnæus.
Gobius albopunctatus, Cuvier and Valenciennes.
Salarias meleagris, Cuvier and Valenciennes.

The following are given as native names at Ocean Island, as specimens were not obtained the species cannot be given.

Hammer-headed Shark, *Te-pakoa te anoa*.
 Tiger Shark, *Emurr*.
 Flying Fish, *Te-nouti*.
 Palu, *Te-kanebek*.

The last-named, of which I have seen a photograph, is *Ruvettus pretiosus*, Cocco, a species I first recorded from the South Pacific.¹

¹ Waite—Aust. Mus. Mem., iii., 1899, p. 539.

THE MOLLUSCA.

By C. HEDLEY, Conchologist.

The collection of shells brought from Pleasant Island includes no new or remarkable forms. All commonly occur in the Central Pacific. The species are as follows:—

- Acmea stellaeformis*, Reeve.
Trochus maculatus, Linne.
Turbo argyrostomus, Linne.
Nerita plicata, Linne.
Helicina musiva, Gould.
Vanikoro petitiana, Recluz.
Ianthina ianthina, Linne.
Cerithium columna, Sowerby.
Cypræa arenosa, Gray.
 " *arabica*, Linne.
 " *carneola*, Linne.
 " *caput-serpentis*, Linne.
 " *cicercula*, Linne.
 " *helvola*, Linne.
 " *isabella*, Linne.
 " *moneta*, Linne.
 " *nucleus*, Linne.
 " *reticulata*, Martyn.
 " *scurra*, Chemnitz.
 " *stolida*, Linne.
 " *talpa*, Linne.
 " *teres*, Gmelin.
 " *tigris*, Linne.
 " *ventricosa*, Linne.
Purpura hippocastaneum, Lamk.
 " *armigera*, Chemnitz.
Sistrum dumosum, Conrad.
 " *horridum*, Lamk.
Mitra pontificalis, Lamk.
Conus auratus, Hwass.
 " *glans*, Hwass.
 " *geographus*, Linne.
 " *hebraeus*, Linn.
 " *lividus*, Hwass.
 " *miliaris*, Hwass.
 " *rattus*, Hwass.

Stenogyra gracilis, Hutton.
Modiola australis, Gray.
Melina perma, Linn.
Libitina guineaica, Lamk.
Circe pectinata, Linne.
Venus reticulata, Linne.
Tridacna elongata, Linne.
Chama, sp.

THE ARTHROPODA.

By W. J. RAINBOW, F.L.S., Entomologist.

Very few specimens in this division were collected, and these, which are enumerated below, are well known Pacific forms. It is apparent, from the material obtained, that no serious effort at collection was made, otherwise the results would undoubtedly have been greater. Nevertheless, the collection, small as it is, is important and of interest, seeing that nothing has hitherto been published concerning the fauna of these small and out of the way Islands.

The following is a list of the specimens obtained:—

ORDER ARANEIDÆ.

FAMILY ULOBORIDÆ.

GENUS ULOBORUS, *Latr.*

ULOBORUS GENICULATUS, *Oliv.*

This species is widely distributed, occurring in nearly all tropical regions.

Loc.—Pleasant Island.

FAMILY ARGIOPIDÆ.

GENUS TETRAGNATHA, *Latr.*

TETRAGNATHA PANOPEA, *L. Koch.*

Previously recorded from the Islands of Tanna and Malekula, New Hebrides; Samoa; and Noumea, New Caledonia.

Loc.—Pleasant Island.

GENUS ARANEUS, *Clerck* (= *Epeira*, *auct.*).

ARANEUS THEISII, *Walck.*

This species is common in all tropical regions.

Loc.—Ocean Island.

FAMILY CLUBIONIDÆ.

GENUS HETEROPODA, *Latr.*HETEROPODA VENATORIA, *Linn.*

This species, like the preceding, is also common in all tropical regions.

Loc.—Ocean and Pleasant Islands.

FAMILY ATTIDÆ.

GENUS PLEXIPPUS, *C. Koch.*PLEXIPPUS PAYKULLI, *Aud.*

Very widely distributed—in fact, cosmopolitan.

Loc.—Pleasant Island.

ORDER MYRIAPODA.

Two specimens of the genus *Julus*, *Linn.*, were collected on Pleasant Island, but were too immature for specific determination. The native name for these creatures is Te tapoa.

ORDER COLEOPTERA.

FAMILY TROGOSITIDÆ.

GENUS LATOLEVA, *Reitt.*LATOLEVA INCENSA, *Olliff.*

Previously recorded from Aru; Salwatty; New Guinea.

Loc.—Pleasant Island.

FAMILY CLERIDÆ.

GENUS CORYNETES, *Herbst.*CORYNETES CÆRULEUS, *De Geer.*

This species is cosmopolitan.

Loc.—Pleasant Island.

FAMILY ELATERIDÆ.

GENUS MONOCREPIDIUS, *Esch.*MONOCREPIDIUS UMBRACULATUS, *Cand.*

Previously recorded from New Guinea and Funafuti, Ellice Group.

Loc.—Ocean and Pleasant Islands.

FAMILY BOSTRYCHIDÆ.

GENUS RHIZOPERTHA, *Steph.*RHIZOPERTHA RELIGIOSA, *Boisd.*

Previously recorded from New Britain and New Guinea.

Loc.—Pleasant Island.

FAMILY CEDEMERIDÆ.

GENUS NACERDES, *Schm.*

NACERDES TRANSMARINA, *Rainb.*

Previously recorded from New Guinea and Funafuti, Ellice Group.

Loc.—Ocean and Pleasant Islands.

ORDER ORTHOPTERA.

FAMILY CONOCEPHALIDÆ.

GENUS CONOCEPHALUS, *Thund.*

CONOCEPHALUS TROUDETI, *Le Guil.*

Previously recorded from Northern Australia and New Guinea.

Loc.—Pleasant Island.

FAMILY CEDIPODIDÆ.

GENUS PACHYTYLUS, *Fieb.*

PACHYTYLUS CINERASCEUS, *Schaff.*

This species which is widely distributed is very variable, both in size and colour. It has been recorded from Victoria River, N. Australia; New Zealand; New Hebrides; Sandwich Islands; Corea; Mauritius; South Africa; Teneriffe; Madeira.

Loc.—Pleasant Island.

ORDER LEPIDOPTERA.

No Butterflies were obtained, but several Moths were collected. These were, unfortunately, too worn to be of value. Amongst them there was one of the Sphingidæ, from Pleasant Island, probably a species of *Acosmeryx*, Butl., but it was too broken to permit one to speak with certainty. Other species were:—

FAMILY APAMIIDÆ.

GENUS AMYNA, *Guén.*

AMYNA OCTO, *Guén.*

Previously recorded from the Ellice and Gilbert Groups.

Loc.—Ocean Island.

FAMILY REMIGIIDÆ.

GENUS REMIGIA, *Guén.*

REMIGIA TRANSLATA, *Walk.*

This species has been recorded from Ceylon; Marshall Islands; and the Ellice Group.

Loc.—Pleasant Island.

THE CRUSTACEA AND ECHINODERMATA.

By T. WHITELEGGE, Zoologist.

The collection consists of fifty-two specimens,—forty-two Crustaceans and ten Echinoderms. The species are as follows:—

CRUSTACEA.

Micippa philyra, Herbst.
Daira perlata, Herbst.
Eriphia scabricula, Dana.
Cardisoma hirtipes, Dana.
Gecarcinus lagostoma?, Edwards.
Ocypoda cordimana, Desmarest.
Geograpsus crinipes, Dana.
Cenobita spinosa, Edwards.
C. rugosa, Edwards.
Clibanarius taeniatus, Edwards.
Calcinus herbsti, De Mann.
Atya bisulcata, Randall.
Gonodactylus trispinosa, White.

ECHINODERMS.

Echinothrix turcarum, Schym.
Heterocentrotus mamillatus, Klein.
Echinometre lucunta, Leske.
E. oblonga, Blainville.
Ophiocoma brevipes, Peters.
Muelleria echinites, Jaeger.
Holothuria atra, Jaeger.

CRUSTACEA.

MICIPPA PHILYRA, *Herbst.*

Micippa philyra (Herbst.), H. Milne Edwards, Hist. Nat. Crust., i., 1834, p. 330; A. Milne Edwards, Nouv. Arch. Mus., viii., 1834, p. 239, pl. xi., fig. 2.

Two small males of this species were obtained at Pleasant Island.

DAIRA PERLATA, *Herbst.*

Daira Perlata (Herbst.), Dana, Crust. U.S. Explor. Exped., i., p. 204, pl. x, fig. 14.

Two males and two females from Pleasant Island.

ERIPHIA SCABRICULA, Dana.

Eriphia scabricula, Dana, Crust. U.S. Explor. Exped., i., p. 247, pl. xiv., fig. 5a.

A single specimen is present in the collection.

CARDISOMA HIRTIPES, Dana.

Discoplax longipes, A. Milne Edwards, Nouv. Arch. Mus., ix., 1873, p. 294, pl. xv.

A fine male specimen of this species was collected at Pleasant Island.

Length of carapace	...	...	...	68 mm.
Breadth of carapace	...	...	...	74 "
Total width with legs extended	...	...	...	355 "

GECARCINUS LAGOSTOMA, H. Milne Edwards.?

Gecarcinus lagostoma, H. Milne Edwards?, Hist. Nat. Crust., ii., 1837, p. 27; Ann. Sci. Nat., (3), xx., 1853, p. 203; Ortmann, Zool. Jahrbüch., x, 1897, p. 337.

A single example of this genus is present in the collection from Ocean Island. A great deal of uncertainty exists in regard to the only species recorded from the Pacific, *Gecarcinus lagostoma*, Milne Edwards, which was supposed to have been collected in Australia by Quoy and Gaimard. Ortmann considers the locality as erroneous, and also that Mier's figure truly represented *G. lagostoma*, M. Edwards. The latter author has examined what he surmises is the type of the species, from M. Guérin's collection. The specimen under notice is apparently distinct from that figured by Miers, and may possibly be the original *G. lagostoma*, M. Edwards. Under these circumstances I propose to describe the species under this name, and trust to future investigators to determine the true position of it.

The carapace is 60 mm. long and 78 mm. wide, the frontal region is strongly convex and the lateral regions are broadly and evenly rounded. The orbits measure 11 mm. by 8 mm., and the frontal process is 12 mm. in length. The front has a slightly raised granular margin, which is continued on each side to the inferior orbital hiatus, the granules, as the latter is approached, gradually increase in size and in distance apart. The rudimentary antero-lateral line is represented by a very faint ridge, which commences at the external orbital border, and is continued for a distance equal to the length of the orbit. The apex of the basal joint of the second antennæ is almost in contact with the external angle of the front; immediately below its insertion, a well marked granular ridge arises and is con-

tinued to within a short distance of the end of the faint antero-lateral line; its total length is about 18 mm. The upper surface of the carapace is smooth, glossy and closely punctate. The post-orbital region is plain, and the post-frontal space has two low rounded elevations; in advance of the latter a pair of very faint transverse lines are present; they can only be seen with difficulty and at certain angles. A well defined median groove exists on the anterior third of the carapace, and a lateral pair extends from the orbits to the anterior border of the cardiac region. The course of the grooves is marked by four pairs of depressed yellow spots. The first pair are situated about their own diameter from the external orbital border, and mark the commencement of the grooves, the second are 15 mm. posterior to the first pair, and 33 mm. from each other, the third are 15 mm. apart and about the same distance from the two preceding, and 9 mm. from the last pair.

The pterygostomial region is quite glabrous; the inflected surfaces and the meral joints of the legs are more or less covered with squamiform granulations; the inferior surface of the body is smooth and remotely punctate.

The external maxillipedes agree in shape and size with de Haan's figure of *Gecarcinus ruricola*.¹ In the figure given by Miers² the interno-distal angle of the third joint is depicted as being rounded and the outer border is about twice as long as the inner. In the specimen under notice the third joint has the lateral borders of equal length, and the internal angle is a little more prominent than the outer, with a moderately large emargination in the middle of the distal border, behind and below which the fourth joint is articulated, the upper two-thirds of the joint being exposed. The merus joints of the first pair of legs have a double row of large alternating granules along the anterior border, and a broader series confined to the proximal half of the posterior angle.

The upper surface of the carpus, the external surface of the palm and fingers are closely punctate, the extremities of the fingers are studded with horny granules, or rudimentary spines. The left hand is much the larger, it is 70 mm. in length and 30 mm. in depth at the base of the fingers; the latter are widely separated and meet only at their tips. The fingers of the right hand are almost in contact throughout when closed; their inner edges are armed like the left with a series of about five tubercles on the lower, and three closely placed denticles on the proximal portion of the upper border. The last three joints of the ambulatory legs are armed with

¹ De Haan—Fauna Japon., Crust., 1833, pl. C.

² Miers—Chall. Rep., Zool., xvii., pl. xviii., figs. 2, b and c

horny spinules, the fifth joint has two rows seated on the angles of the upper border, the sixth has four and the seventh six rows, all of which are confined to the prominent angles of the joints. Between the bases of the fourth and fifth legs there is a series of long hairs, which are probably similar in function to those occurring at the bases of the third and fourth legs in the genus *Ocypoda* and also in *Geograpsus crinipes*, Dana.

OCYPODA CORDIMANA, *Desmarest*.

Ocypoda cordimana, Desmarest, Consid. sur le Crustacés, 1803, p. 121; Miers, Ann. Mag. Nat. Hist., (5), x., 1882, p. 387, pl. xvii, fig. 9.

A single half grown male example is present in the collection.

GEOGRAPSUS CRINIPES, *Dana*.

Geograpsus crinipes, Dana, Crust. U. S. Explor. Exped., i., p. 341, pl. xxi., fig. 6; Whitelegge, Aust. Mus. Mem., iii., 2, p. 139.

A fine male example of this species was obtained at Pleasant Island.

CENOBITA SPINOSUS, *H. Milne Edwards*.

Cenobita spinosus, H. Milne Edwards, Hist. Nat. Crust., ii., 1837, p. 242.

Cenobita olivieri, Owen, Voy. "Blossom," 1839, p. 84.

Cenobita brunnea, Dana, Crust. U.S. Explor. Exped., i., 1852, p. 420, pl. xxix., fig. 10.

Birgus hirsutus, Hess, Decap-krebs. Ost. Austral., 1865, p. 36, pl. vii., fig. 16.

Cenobita olivieri and *C. brunnea* (Dana), Haswell, Aust. Mus. Cat., v., Crust., 1882, p. 160-161.

Two specimens of this species were obtained at Pleasant Island in the shells of *Turbo argyrostoma*, Linné.

CENOBITA RUGOSA, *H. Milne Edwards*.

Cenobita rugosa, H. Milne Edwards, Hist. Nat. Crust., ii., 1837, p. 241; Dana, Crust. U.S. Explor. Exped., i., 1852, pl. xxx, figs. 1-2.

Three specimens are present in the collection.

CLIBANARIUS TENIATUS, *H. Milne Edwards*.

Clibanarius teniatus, H. Milne Edwards, Ann. Sci. Nat., Zool. (3), x., 1848, p. 62.

Pagurus clibanarius, Quoy and Gaimard, Voy. "Uranie," Zool., Crust., pl. lxxviii., fig. 1.

A single example of this beautifully marked species was obtained at Pleasant Island.

CALCINUS HERBSTI, *De Mann.*

Calcinus tibicen, H. Milne Edwards, Hist. Nat. Crust., ii., 1837, p. 229; Atlas, Cuv. Regn. Anim., Crust., 1849, pl. xlvi., fig. 3.
Calcinus herbsti, De Mann, Arch. Naturg., liii., 1, fig.; 1887, p. 437.

There are four examples of this common species from Pleasant Island.

ATYA BISULCATA, *Randall.*

Atya bisulcata, Randall, Journ. Acad. Nat. Sci. Phil., viii., p. 140, pl. v, fig. 5.

About twenty young examples which are with some hesitation referred to this species. The specimens are too immature to determine satisfactorily.

GONODACTYLUS TRISPINOSUS, *White.*

Gonodactylus trispinosus, White, Miers, Ann. Mag. Nat. Hist., (5), v., 1880, p. 121, pl. iii., fig. 10.

One specimen of this species from Pleasant Island.

ECHINODERMS.

ECHINOTHRIX TURCARUM, *Schym.*

Echinothrix turcarum (Schym.), Agassiz, Rev. Echini, Mem. Mus. Comp. Zool., iii., p. 416, pl. iiiia, fig. 3.

One specimen from Pleasant or Ocean Island.

HETEROCENTROTUS MAMILLATUS, *Klein.*

Heterocentrotus mamillatus (Klein), Agassiz, Rev. Echini, iii., p. 428.

Two specimens from Ocean or Pleasant Island. The spines are dark purple with one or two subterminal whitish rings.

ECHINOMETRA LUCUNTER, *Leske.*

Echinometra lucunter (Leske), Agassiz, Rev. Echini, iii., p. 341.

A single example from Ocean or Pleasant Island.

ECHINOMETRA OBLONGA, *Blainville.*

Echinometra oblonga (Blainville), Agassiz, Rev. Echini, iii., p. 433.

A solitary specimen was obtained at Ocean or Pleasant Island.

OPHIOCOMA BREVIPES, *Peters.*

Ophiocoma brevipes, Peters, Arch. Naturg., xviii., 1852, p. 85.

A small immature example is referred to this species. Ocean or Pleasant Island.

MUELLERIA ECHINITES, *Jaeger*.

Muelleria echinites, Jaeger, De Holoth., 1833, p. 17-18, pl. iii., fig. 6; Semper, Reisen. Arch. Phil., Holoth., i., 1868, p. 76, pl. xxx., fig. 8.

One specimen from Pleasant Island.

HOLOTHURIA ATRA, *Jaeger*.

Holothuria atra, Jaeger, De Holoth., 1833, p. 22; Théel, Chall. Rep., Zool., xiv., p. 181, pl. vii., fig. 4.

Three specimens from Ocean or Pleasant Island.

NOTES AND ANALYSES OF PHOSPHATIC SPECIMENS

By CHARLES ANDERSON, M.A., B.Sc., Mineralogist.

Most of these specimens were presented by Mr. F. Danvers Power, two being the gift of Mr. J. T. Arundel.

1. This specimen is stalactitic in structure and has an outside layer, brownish in colour and about an eighth of an inch in thickness, while the interior shows coral structure. The outer layer is fairly hard and compact, carries warty, stalactitic growths, and in parts the surface is slightly mammillated.—Ocean Island.

2. Consists of a single stalactite about four inches long, solid throughout, with internal coralline structure. Like the preceding it shows an outer more compact skin, slightly darker in colour. Here, however, the contrast is not so striking, the whole being more homogeneous in grain and of a fairly uniform dirty white. In this specimen the external surface is rough.

Loc.—Ocean Island.

3. This is an alluvial specimen consisting of rounded and subangular fragments of a prevailing white colour, set in a matrix of finer-grained, buff-coloured material. These fragments have the characteristic darker outer layer, and some shew a concentric structure (pisolitic). A bulk analysis of this specimen yielded the following result:—

Moisture at 100° C.	...	...	...	1.69 %
Loss at 180° C.	...	...	...	.39
Carbonic Anhydride (CO ₂)	...	...	...	3.12
Organic Matter (by Difference)	...	...	...	1.34
Lime (CaO)	...	...	...	52.80
Phosphoric Anhydride (P ₂ O ₅)	...	...	...	39.85

99.19

Loc.—Ocean Island.

4. This specimen is marked by a stratified arrangement. It consists of two different kinds of phosphate, one white and friable, the other buff-coloured and compact, and these are arranged in irregular layers. At the junction there is in places a commingling of the two, the darker shedding blocks into the other, while it is itself intruded by the latter. An attempt was made to get a sample of the darker coloured material for analysis, and a fairly homogeneous piece gave the following figures:—

Carbonic Anhydride (CO ₂)	...	...	2.22 %
Loss on ignition (less CO ₂)	...	...	3.84
Lime (CaO)	...	...	53.61
Phosphoric Anhydride (P ₂ O ₅)	...	...	39.72
			99.39

Loc.—Ocean Island.

5. Of an almost uniform white, and varies in hardness between 1 and 3. It shews a few shell remains. On analysis it was found to have the following composition:—

Moisture at 100° C.	...	...	1.48 %
Loss at 180° C.	...	...	1.29
Carbonic Anhydride (CO ₂)	...	...	2.15
Organic Matter (by Diff.)	...	...	5.13
Lime (CaO)	...	...	52.78
Phosphoric Anhydride (P ₂ O ₅)	...	...	36.72
			99.55

Loc.—Ocean Island.

6. This specimen is from an upraised coral formation. It is hard and compact, of a prevailing white, and is characterised by the presence of numerous shells and casts of molluscs. An analysis showed the composition to be as follows:—

Moisture at 100° C.	...	...	1.09 %
Loss at 180° C.	...	...	.52
Carbonic Anhydride (CO ₂)	...	...	3.12
Organic Matter (by Difference)	...	...	2.27
Lime (CaO)	...	...	53.21
Phosphoric Anhydride (P ₂ O ₅)	...	...	39.08
			99.29

Loc.—Ocean Island.

7. Has a ferruginous interior, which appears where the specimen was broken off from the main mass; outside is a layer of white phosphate. The surface is covered with numerous excrescences, which may be described as botryoidal in character.

Loc.—Pleasant Island.

8. Shows a thin external layer, which is smooth, mammillated and brownish. The remainder of the specimen is apparently of coralline nature.

Loc.—Pleasant Island.

9. This is a hollow stalactite, about two inches long. It is smooth and hard (about 4) and greyish in colour.

Loc.—Ocean Island.

10. A phosphatic nodule, roughly spherical, about six-eighths of an inch in diameter, and has a fairly good enamel on some parts of the surface.—

Loc.—Ocean Island.