PAPERS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA,

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Errata.

Page 37.—Fourth line from bottom, for "*Phalangesta,*" read "*Phalangista.*"

Page 43.—Line 19, for "*Pulmo branchiata,*" read "*Pulmobranchiata.*"

Page 45.—Line 15, for "by the chair," read "from the chair."

Page 122.—In sub-heading of tables [I] and [K] for "Age at Death," read "Age."

Page 125.—In sub-heading of last table for "Age at Age," read "Age at Death."

The responsibility of the statements and opinions given in the following Papers and Discussions rests with the individual authors the Society as a body merely places them on record.

Contents.

ROYAL SOCIETY.

MARCH, 1875.

The monthly evening meeting of the Society was held on Tuesday, the 9th March, M. Allport, Esq., V.P., in the chair.

The following gentlemen, who had previously been nominated by the Council, were balloted for, and declared duly elected as Fellows of the Society, viz., His Honor Sir Francis Smith, the Rev. Thos. Kelsh, Messrs. John Kenrick Lewis, H. A. Perkins, and C. Dowdell.

Professor W. Harkness, of the United States Naval Observatory; Henry Heylin Hayter, Esq., Government Statist, Victoria; Fredk. M. Bailey, Esq., Brisbane, Queensland; and A. Thozet, Esq., Botanist, Rockhampton, were elected as corresponding members.

The Hon. Secretary (Dr. Agnew) laid before the meeting the usual monthly returns as under:—

1. Number of visitors to Museum in January, 1,579; in February, 1,221.
2. Ditto to Gardens ditto, 3,893; ditto, 2,923.
3. Plants, &c., received at and sent from Gardens during January and February.
4. Time of leafing, &c., of a few standard plants in Botanic Gardens during February.
5. Books and periodicals received.
6. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq., tables for January and February.
2. New Norfolk, from W. E. Shoobridge, Esq., ditto ditto.
3. Mount Nelson, from Marine Board, ditto ditto.
4. Goose Island, from ditto, table for January.
5. Port Arthur, from J. Coverdale, Esq., tables for January and February.
6. Sydney, from H. C. Russell, Esq., B.A.—Printed tables for September, 1874.
7. Melbourne, from R. L. J. Ellery, Esq.—Ditto, for August, 1874.

The presentations to the Museum were as follows—

1. From Mr. H. G. Lloyd, New Norfolk.—Three specimens of wood, and three of fossil wood, from Queensland.
2. From F. A. Blackman, Esq.—Two snakes, 1 lizard, 1 bat, 1 large beetle, and a collection of land and fresh water shells, from Warro, Port Curtis, Queensland.
3. From the Rev. J. E. Tenison Woods.—Three specimens of gold from Devonian Rock, Smithfield Reef, Gympie, Queensland.

[Remarkable for being in close proximity to fossils (Devonian), and occurring partly in quartz and partly in greenstone. The gold is not pure, as will be seen from its colour, containing ten per cent. of silver, and traces of copper, lead and iron.]

4. From C. E. Morton, Esq., Grafton, New South Wales.—A female specimen of a species of "Walking-leaf Insect," probably *Extatosoma tiaratum. (See British Museum catalogue of Orthopterous Insects, part 1; "Phasmidæ," page 170, plate 8, supplement.)*

5. From Mr. R. J. Harris, Sorell.—A large Black Snake *(Hoplocephalus curtus).*
6. From M. Allport, Esq.—A smaller ditto.
7. From "Jonah," a native teacher from Samoa.—A model of a Samoan fishing canoe, made by him when in Tasmania, and presented through the Rev. G. Brown, Wesleyan missionary. A large sheet of Tapa cloth.
8. From Mr. D. Hancock, O'Brien's Bridge.—A specimen of *Spirifera bisulcata*, from slope of Mount Wellington. [An unusually large and very perfect example of the fossil.]
9. From J. W. Graves, Esq.—A bivalve shell *(Crassatella castanea)* from the North Coast of Tasmania.
10. From Mr. J. Ferguson.—A crab from Tinder Box Bay.
11. From Mr. S. H. Wintle.—Samples of iron ore, limestone, and coal, from the River Don, Tasmania.
12. From J. Simpson, Esq., *Mercury* office.—Sample of stream tin, from Mount Horror, Dorset, Tasmania.
13. From Mr. E. N. Spong.—A collection of sponges, rock specimens, portion of old telegraph cable, &c., &c., from King's Island.
14. From Mr. C. H. Hall.—Specimen of tin in lode, stream tin, tin nuggets, gallena, antimony, &c., from Mount Bischoff.
15. From Mr. F. J. Davies.—Samples of tin, antimony, silver ore, peacock copper ore, &c.—From Stanthorpe, Queensland.
16. From Col. Crawford.—Sample of tin smelted from Mount Bischoff ore.
17. From H. Hopkins, Esq.—20 Chinese "cash." A "Caltrop"—A sharp four-pronged instrument used in the late war by the Chinese for scattering about the ground to embarrass the advance of hostile troops.
18. From Mr. Lewis, Geelong.—A large Echinus, from the Pacific.
19. From Master H. Hull.—Egg of the Native Companion, or Australian Crane *(Grus Australasianus.)*
20. From Mr. W. L. May, Muddy Plains.—A curious marine incrustation on shell of Pecten, from Frederick Henry Bay.
21. From W. A. Kermode, Esq.—Two samples of salt from Saltpan Plains, Mona Vale.
22. From His Excellency F. A. Weld, Esq.—Two Lizards from Western Australia. A collection of ornaments, nets, and other implements made by the Aborigines of that colony.
23. From John Macfarlane, Esq.—Two specimens of the "Glass Thread Sponge" *(Hyalonema mirabilis)*, from Japan.

[The Rev. J. E. Tenison Woods made some observations on this very remarkable object, and expressed his intention of giving further details in reference to it at the next meeting.]

24. From N. J. Browne, Esq., M.H.A. — Specimens of Opalized Wood from Meadow Banks.
25. From Mr. Prescott—Two specimens of the gladius or "pen" of a species of Squid.
26. From the Hon. J. Maclanachan, Esq.—A Mountain Duck *(Casarca tadornoides).*
27. From Mr. Hissey.—Skin of the "White Bird" of Kerguelen's Land *(Chionis necrophaga).*
28. From Mrs. Buckland.—A framed portrait of the late Sir Henry Young.

The following presentations to the Library were reported :—

From the Royal Colonial Institute.—Proceedings for 1873-4.

From the Rev. J. E. Tenison Woods.— "Hume's overland journey from Lake George to Port Phillip, 1824." Roots, &c., used as food by the Aboriginals of Northern Queensland;" by A. Thozet. "Extract from Bulletin of the Acclimatisation Society of France, July, 1872." "Lectures delivered at Industrial and Technological Museum, Melbourne, 1872." "Hortus Kewensis, Epitome to;" by W. T. Ayton, 1814. "Geology of Queensland,—Notes on, by R. Daintree, F.G.S."

From the author, F. M. Bailey, Esq., "Handbook of Queensland Ferns."

From the author, Professor A. Liversidge, Sydney University, "Iron and Coal deposits at Wallerawang, New South Wales." "Nickel Minerals from New Caledonia" (two pamphlets.) "On Dendritic Spots." "The Bingera Diamond Field." "The Deniliquin, or Baratta Meteorite."

From the Royal Society of New South Wales.—"Transactions," 1872-3.

From the Malacological Society of Belgium.—Reports of Proceedings of vol 8, 1873; vol.3, 1874.

From the Entomological Society of Belgium.—Transactions of, series 2, Nos. 1, 2, 3, Nos. 96 to 100.

From the Department of Agriculture, United States.—Annual Reports of Department for 1870-1-2; monthly ditto for 1871-2-3.

A specimen of Argentiferous Galena, accompanied by the following memorandum, and forwarded by Mr. S. H. Wintle was exhibited. "This specimen of argentiferous galena is Tasmanian, and according to Melbourne assay yields I am assured, 82 per cent. of combined metal, of which 48 per cent. is silver. The actual locality is not at the present time made known to the public. I have not been able to find time to make any test of it myself, but regarding it from its outward appearance it justifies all that has been said of it."

A subsequent communication from Mr. Wintle was read to the effect that the specimen submitted for analysis was a picked one, and as far as he could judge from a rough assay with the blowpipe, the sample of the ore exhibited yielded little over 60 per cent. of combined metal—silver being a little in excess of the lead.

Dr. AGNEW read a note from Mr. W. A. B. Gellibrand mentioning that in reply to some enquiries directed to Mr. L. C. Miall, of Leeds, he had recently received from England, a pamphlet and some papers upon wool, together with the following note :—

"Keighley, Nov. 30th, 1874.

"Dear Miall,—The best authority that I know has been in London at the sales for some time back or I would have replied earlier. As to New Zealand wools;

"1. It is better to wash with cold water if the fleece will 'scour' or cleanse well; if it will not scour, tepid water and little soft soap must be used.

"2. The wool must be washed before shearing the sheep; thus the wool dries easily and naturally.

"3. The fleece should not be 'sorted,' that is, made into different qualities, but only the dirt and locks taken off. Every spinner has his own idea of the kind of division he requires in the qualities of the fleece.

"4. Wool that is 'dumped,' or hard packed, is not really injured, but the idea is prevalent among importers that it does not sell so well; as the *appearance* of the wool is injured by pressure. Herewith you have printed information from the Chamber of Commerce, and remarks in the two reports containing replies to former enquiries on similar subjects.

"Yours very truly,

"JOHN BRIGG."

[The pamphlet and papers will be left on the table at the Museum for the inspection of any person who may wish to peruse them.]

The Rev. J. E. Tenison WOODS, F.G.S., F.R.G.S., a corresponding member of the Society, read a paper "On some Tertiary Fossils from Table Cape." [In alluding to the various works which he had occasion to consult when writing his paper, the author took occasion to compliment the Society on the richness of its library. He was both astonished and pleased at being able to refer to so many authorities, and it was evident that great care and intelligence had been exerted in forming a collection of books, of which, especially when the limited number of its members was considered, the Society had certainly just reason to be proud.]

A short discussion ensued, after the reading of the paper, in which the members expressed their extreme gratification at the help given by it to the subject of Tasmanian palæontology. In answer to several questions from Bishop Bromby, Mr. Woods stated that the Cretaceous formation, upper and lower, were extensively found on the western side of the dividing range in Northern Queensland. He added that fossiliferous beds of all the leading formations were found in Australia, including the Oolite, Lias, and Trias.

A special vote of thanks was then moved by Bishop Bromby to the reverend gentleman for his able and interesting paper. He was sure the members of the Society would agree with him in saying that their thanks were more especially owing because the author was known to have left himself but little leisure for such studies from the higher and holier labours to which, as every one knew, he had so completely dedicated himself, and at a time when barely recovered from a long and serious illness, he had made this effort to fulfil a former promise to them. The present instance was one which showed how the highest interest in the cause of God was combined with ardent admiration and knowledge of God's works, and it must command their warmest commendation as well as their thanks. Mr. Barnard seconded the motion, which was carried by acclamation, and the meeting separated.

APRIL, 1874.

The monthly evening meeting of the Society was held on Tuesday, the 13th April. P. T. Smith, Esq., in the chair.

The following gentlemen, who had previously been nominated by the Council, were ballotted for and declared duly elected as Fellows of the Society, viz., the Rev. W. W. Spicer, of Jutland, New Town; and A. Simson, Esq., of Brighton.

The Secretary submitted the following returns for the month of March :—

1. Visitors to Museum, 1155.
2. Ditto to Gardens, 3113.
3. Plants received at Gardens—From Mr. W. Bull, London, 12 tuberous rooted Begonias, and 1 packet of seeds. From Jules de Cock et Sœur, France, 25 packets seeds. From the North China Branch, Royal Asiatic Society, 1 packet of seeds and bulbs. From the Rev. J. E. Tenison Woods, 4 species of Dendrobium, from Queensland.
4. Plants, &c., sent from Gardens—To Department of Agriculture, Washington, U.S. America, 3 Tree Ferns, and 10 packets seeds.
5. Time of leafing, flowering, and fruiting of a few standard plants in Society's Gardens during March.
6. Books and periodicals received.
7. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq.—Table and summary for March.
2. Mount Nelson, from Marine Board.—Table for March.
3. New Zealand, from Dr. J. Hector, F.R.S., &c.—Meteorological Report for 1873; printed abstract tables from various stations for August to December, 1874. Monthly tables from Wellington, September, 1874 to January, 1875.

The presentations to the Museum were as follows :—

1. From R. Butler, Esq.—A young Black Snake *(Hoplocephalus curtus)*, beautifully marked.
2. From Mrs. Hooper, Battery Point.—A young Cuttle Fish, taken from the stomach of a fish.
3. From J. Miller, Esq., Carrick, per J. W. Graves, Esq.—A young Kangaroo, from the pouch.
4. From Mr. H. Judd, Franklin.—A curious Spider, found among tree ferns.
5. From Mr. F. Salier.—A Crab from Howe's Island.
6. From Mr. Radcliffe.—A specimen of *Ibacus Peronii* from East Coast Tasmania.
7. From Mr. J. Mezger.—Specimen of the Port Jackson Shark (*Cestracion Phillipi*), from Adventure Bay.
8. From Lady Dry.—A young Cuckoo.
9. From Mrs. Parsons.—An albino variety of the common Opossum. *(Phalangista fuliginosa)*. A White Hawk (*Leucospiza Novæ Hollandiæ*). A yellow-bellied Beaver Rat (*Hydromys Chrysogaster*). A Rat (*Mus fuscipes ?*). Specimen of (*Antichinus Swainsonii*). A Bandicoot (*Perameles Gunnii*). A Petrel.
10. From Mr. C. Weeding.—6 stone implements of Tasmanian Aborigines. Specimen of Native Bread *(Mylitta Australis)*. Two pieces of fossil Wood, ploughed up at the Eastern Marshes.
11. From J. E. Calder, Esq.—A collection of bones of Native animals procured in 1870 from a cave at Glenorchy.

In reference to this presentation, the Secretary read a note from Mr. Calder, from which the following is an extract :—"I beg to send you the bones promised yesterday, that I got from what is called a bone-cave on one of the basaltic ridges of Glenorchy, but which is only a deep narrow hole, or fissure in the rocks." (A full account of the finding of the bones was published immediately afterwards in the *Tasmanian Times.*)

12. From Dr. G. Bennett, F.Z.S.—A collection of Fossils from New South Wales; viz., teeth of *Diprotodon* and *Nototherium*, jaws of fossil Kangaroo, *Thylacine*, &c.

This very valuable and interesting contribution was examined with great attention by the meeting. The SECRETARY at the same time mentioned what he was sure would give great pleasure to the Fellows, that Dr. Bennett during his recent visit had taken great interest both in the Museum and in the affairs of the Society generally, and that he had promised still further contributions to the Museum, and also papers for their publications.

The SECRETARY read a paper on "Some New Species of Tasmanian Shells," by the Rev. J. E. Tenison Woods, F.G.S., F.R.G.S., &c. This paper, which was descriptive of eight new shells procured by Mr. W. Legrand by dredging in Long Bay, D'Entrecasteaux Channel, will be published in the next number of the Society's Transactions.

The CHAIRMAN having reminded the meeting that the question of undertaking the supervision of works for the improvement of the Domain had on a former occasion occupied their attention, begged to know if anything further had been done in the matter. The meeting was informed that a letter on the subject had been addressed to Government, but that no reply had been received. It was understood, however, that the subject was under the favourable consideration of the Government, and that the necessary works were only delayed on account of the present scarcity of labour.

A vote of thanks to the author of the paper and to the donors of presentations closed the proceedings.

MAY, 1875.

The monthly evening meeting was held on Tuesday, the 11th May, M. Allport, Esq., V.P., in the chair.

Joseph Broughton, Esq., of New Town, who had previously been nominated by the Council, was ballotted for, and declared duly elected, as a Fellow of the Society.

The SECRETARY brought under notice the following returns for the month of April :—

1. Visitors to Museum, 1163.
2. Ditto to Gardens, 2522.
3. Seeds received at Gardens—From Messrs. Macfarlane Bros., 10 packets seeds from Japan. From A. Simpson, Esq., Queensland Ferns.
4. Plants sent from Gardens—To Monsieur A. Verschaffelt, Ghent, Belgium, 12 Tree Ferns.
5. Time of leafing, &c., of a few standard plants in the Botanic Gardens during April.
6. Books and Periodicals received.
7. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq.—Table for April.
2. Port Arthur, from J. Coverdale, Esq.—Ditto.
3. New Norfolk, from W. E. Shoobridge, Esq.—Summary of observations taken during 1874.
4. Mount Nelson, from Marine Board.—Table for April.
5. Melbourne, from the Government Observatory.—Printed tables for September, October, and November, 1874.
6. From the Meteorological Office, London.—Hourly readings of self-registering instruments, at seven observatories, during October, 1874 (one sheet)

The presentations to the Museum and Library were as follows :—

1. From Mr. C. Allen, Port Cygnet.—An Opossum *(Phalangista fuliginosa).*
2. From E. D. Swan, Esq.—Nest and egg of Reed Warbler *(Calamoherpe Australis).*
3. From Mr. W. Peacock, Sorell.—A Nankeen Kestrel *(Tinnunculus cenchroides),* shot in that locality.
4. From J. K. Clark, Esq.—Specimens of Quartz, with penetrating crystals of rutile, from New South Wales.
5. From A. K. Chapman, Esq.—Specimens of a species of Fluke, taken from a large diamond snake.
6. From J. W. Graves, Esq.—Fossil Wood from Risdon.
7. From Mr. J. Bidencope.—Samples of Felt in various stages of preparation for hat making.

[This material is the first of the kind which has been produced in the colony. The various stages of its preparation, from the unwashed wool to the perfect article, are well shown in the presentation.]

8. From the author, Dr. J. Barnard Davis, F.R.S.—An illustrated treatise on the osteology and peculiarities of the Tasmanian aborigines.

[The SECRETARY requested the special attention of the Fellows to this treatise. The illustrations were admirably executed, and as a record of a race which has virtually just passed away from amongst us, it was of peculiar interest to the Society.]

9. From the India Office, London.—Part 3 of "The Flora of British India," by J. D. Hooker, C.B., M.D., F.R.S., &c., &c.
10. From Mr. S. H. Wintle.—The following specimens, obtained by qualitative assays :—Bismuth and Copper, Mt. Ramsay, from Sulphide. Bismuth freed from Copper, Mt. Ramsay. Copper from Mt. Nicholas coal. Ditto, from Ferro-cupreous Pyrites in New Town coal.

In reference to this presentation the secretary read the following note addressed to him by the donor :—

"11th May, 1875.

"Dear Sir,—The samples of metal on the card accompanying this are the result of qualitative analysis only. The copper from such a source, *i.e.*, coal is invested with interest. The gold I obtained by employing the iodine process, which is quite modern, *vide* 'Crooke s Select Methods in Chemical Analysis,' p. 271. Neither Gold or Copper exist in sufficient quantity to have a commercial value. The crude sulphide of Bismuth contains about 15 per cent. of copper.

"I remain, etc., etc.,

"S. H. WINTLE."

Presentations Nos. 2 and 3 were examined with much interest, and in connection with them the CHAIRMAN offered the following remarks :—About the middle last month Mr. Wm. Peacock, of Sorell, presented to the Museum the beautiful specimen of the Nankeen Kestrel (*Tinnunculus cenchroides*) now before you. Tasmania is not given as a habitat of this charming hawk by Gould, and this is probably the first instance of its presence here being publicly recorded, though I find another specimen in the Museum labelled from Clarence Plains, and presented by Mr. Luckman in April, 1873. These specimens are unquestionably a great addition to the Museum, but it should be borne in mind by farmers and gardeners that this bird, like its European congener, preys far more on insects than on any other food, and is therefore not only a source of attraction when wheeling in circles far over head, or poised for minutes together apparently motionless, but is also earning our gratitude by destroying heaps of grasshoppers and other insect pests. Mr. Edward Swan has presented the Museum with the nest and one egg of the Reed Warbler (*Calamoherpe Australis*) obtained by him in Victoria, and has written me from Launceston, recording the presence of the bird in Tasmania as follows :—

"St. Leonards, 21st April, 1875."

"My Dear Allport,—During the past summer I observed a pair of Reed Warblers *(Calamoherpe Australis)* that had taken up their quarters among a bed of reeds on the banks of the North Esk, near Launceston. They arrived there in September, remained till March, and then disappeared. As the Reed Warbler is not allowed by Gould to inhabit Tasmania, and has not, so far as I am aware, been previously noticed in this colony, knowing the interest you take in all matters ornithological, I have much pleasure in informing you of its appearance among us, in order that you may add another to your list of Tasmanian birds. I did not find their nest, though I knew from the actions of the old birds that they had either eggs or young near at hand; but I readily obtained several nests in Victoria along the river Yarra, and in other localities. These were, for the most part, supported by three or four reeds, or suspended from the branches of willows overhanging the water, so that they could not be reached from land. In one case the nest was built at a greater height than usual, on a tree growing some distance from the water. The Reed Warbler is a late breeder ; the nest, which with an egg is forwarded you, was not finished till near the end of January, nor the eggs laid till February. It is probable there are two broods, for the young had left some of the nests found a month earlier. As a songster, it is a success, its only rival here being the striated Reed Lark *(Calamanthus striatus)*, with which and the little Grass-bird *(Sphenœacus gramineus)* it may have been confounded, or, I think, it would have been oftener noticed, as it most likely occurs in other parts of the colony similar to the one indicated. The Melbourne bird-stuffers did not possess any skins of this kind, else I would have procured specimens. Gould's is a good illustration, and to him I refer you for description of plumage.

"Yours sincerely,
"EDWARD D. SWAN."

A letter from Mr. A. K. Chapman, addressed to the secretary, was read. The following is an extract :—

"Sir,—I have the honour to bring under the notice of the Royal Society the desirability of some steps being taken to restore the rapidly diminishing stock of our most valuable timber tree, the blue gum *(Eucalyptus globulus)*.

"The blue gum is so eagerly sought after by shipbuilders that most of the available timber has been cleared from the accessible spots in the Huon district and other localities where blue gum formerly abounded. Hundreds of young trees, of little present value as timber, but inestimably valuable in a few years time if allowed to grow, are annually felled merely for the sake of the seed, which is exported in large quantities to countries, the inhabitants of which have more forethought than ourselves. "In France, Spain, Algeria, Egypt, California, the Mauritius, and, coming nearer home, in the colonies of Victoria and New Zealand, the Tasmanian blue gum is now being grown in large quantities, and is highly esteemed, not only as an ornamental and useful timber tree, but for the protection afforded by its shade, and for the valuable medicinal qualities of its leaves.

"Even in the cold climate of England an attempt is being made by certain enterprising perfumers to grow blue gum trees extensively for the sake of distilling the aromatic oil contained in their foliage. While so much is being done to encourage the growth of this valuable tree elsewhere, we in Tasmania seem to be doing our best to render it extinct, and it is with a view to reverse this very undesirable proceeding that I now address your society.

I would recommend that the society should direct its attention to the question of preserving the blue gum from extinction, and would suggest that the Government be requested to reserve a portion of the Crown land in the vicinity of Port Arthur as a state forest and nursery for young trees. Much of the land on Tasman's Peninsula is practically valueless except for the purpose of growing timber, but with care and attention I believe this land could be made a source of public wealth if devoted to the purposes I have indicated."

Discussion ensued, but the generally expressed feeling was, that considering the enormous extent of country covered with the tree referred to, it was scarcely necessary to take any immediate action towards its preservation.

The SECRETARY, after reminding the meeting that the Society on a former occasion had addressed the Government on the subject of the improvement of the Domain, mentioned that Mr. P. T. Smith had recently taken a warm interest in the matter and had lately requested a visitor to the colony, who was versed in matters of the kind, to inspect the Domain with a view to giving such hints towards possible improvements as he might think necessary. This he was kind enough to do, and subsequently addressed the letter to Mr. Smith which he (Dr. Agnew) would now proceed to read to the meeting :—

"24th April 1875.

"P. T. Smith, Esq., Macquarie-street.

"My dear Sir,—Since I had the pleasure of the drive through a portion of the Queen's Domain with yourself and Dr. Agnew, my opinion respecting that reserve for the purpose mentioned by you, is, that although unrivalled as a site for an ornamental park, not only for the very exquisite views it commands, but from the natural conformation of the surface, yet from the extreme shallowness of the soil overlying a generally impervious rock of considerable depth, it is quite unsuitable, without enormous cost, for the successful culture of trees of large growth ; and the stunted appearance of the existing trees, is abundantly confirmatory of this opinion. There may, nevertheless be isolated spots, of more or less extent, possessing a greater depth of soil; but as these will probably exist only in the lowest depressions, their existence to the landscape gardener would be nearly valueless ; indeed the probabilty is that the entire area is quite unsuitable, without a very large amount of labour, for the permanent growth of the kinds of trees necessary for the adornment of a public park ; for instance, out of the large order *coniferæ,* which contains some of the most beautiful, as well as some of the grandest trees in the world, few would be found, without the special treatment hereafter described, to attain to other than very miserable specimens, totally unlike their natural character.

"Notwithstanding this serious drawback, I consider that much may be done, at a moderate cost, to render this large area of ground more attractive than it is at present. In the first place I would recommend the entire removal, by grubbing, of all the dead and decaying trees, the holes being afterwards filled up, and the ground levelled.

"So far the work could, of course, be done without a plan, but it would be indispensable before proceeding to lay out paths, to form vistas, open out views, or to plant trees, that a design be carefully prepared for the laying out of the entire ground. It is obvious that no new work could be performed without such plan ; and with one, a great deal of labour, otherwise useless, might be saved.

"After a design is adopted, the thinning out of some of the trees, the selection of others to be left more closely together in groups, the opening out of views, the formation of paths, and the erection of seats could all be proceeded with, at a very trifling cost, under proper supervision. The sowing of English grasses on some of the more prominent open glades would also be one of the lesser expensive matters.

"The more costly work of planting new trees might follow these preliminary operations, but in order that this may be done economically, I would recommend that some of the more prominent positions for groups of trees and shrubs should be planted first, the ground for such groups to be deeply trenched for the entire area of each group, rather than the formation of isolated holes for each individual tree—the worst of all modes of planting. This preparation of the ground, in comparatively large areas, is advisable at all times, but it is especially needful here, where, in consequence of an almost impermeable subsoil, the surface soil becomes so soon arid after the cessation of rains. Some of the avenue trees might also be planted early, and in a similar manner, *i.e.* avoiding detached holes for each tree.

"Probably the portion that it may be desirable to plant first would be the comparatively narrow strip lying between the railway and the drive on the northern side of the Domain.

"If these brief notes are of any value, as showing how the work of laying out the Domain may be economically effected, and in a progressive manner, they are quite at your service to use in any way you may think proper ; and I shall be only too glad, in my periodical visits to your lovely island, where Nature has done so much, to mark the progress of substantial improvements in that eminently beautiful locality, the Queen's Domain.

"I am, my dear sir,
"Yours very sincerely,
"J. Sayce."

Mr. Grant considered that the letter contained some valuable suggestions. He thought the Domain was left in its present state for fear of the cost of improving it, but in reality very little outlay was required to effect a great amount of good. The gum and wattle trees in the Domain were generally very poor, they would be well out of the way, and the really beautiful trees of other countries planted in their stead. Trenching on a large scale would of course be expensive, but in many localities the English oak, ash and elm, might be planted without the great expense of trenching, and by the richness and depth of their foliage would be highly ornamental. The American rock maple, again, with all the splendour of its autumnal leaves, would be a grand addition to the beauty of the locality, and all these and other trees could be gradually introduced at very little cost.

Mr. Smith thought that no great outlay was proposed, but rather that everything from the beginning should be done according to some settled plan. The dead and dying wattle trees were quite an eyesore. He would have them all grubbed out forthwith, and the dead wood would pretty nearly pay the expense. By this means alone many fine views, now lost, would be opened up. It might be worthy of consideration if a public subscription to a small amount, say £200 might not be attempted. A good deal could be done with this, and Government might fairly be appealed to afterwards to carry on and complete the work. He would like to ask how it was that a large portion of the Domain was granted to be fenced off for the new cricket ground? He hoped this alienation would be only temporary, as he had a great objection to see this public pleasure ground cut into. It was a disgrace that any portion of it should have been sold, and a few wretched cottages, which were anything but an ornament, built upon it. If Government labour was all that was wanted, surely if it could be obtained for a race-course, it might also be available for the Queen's Domain.

Mr. Barnard highly approved of the proposed grubbing out of all diseased and unsightly trees, and thought the sale of the wood would repay the cost. He deprecated any idea, however, of making the Domain too artificial in its features. He would like it kept as a natural forest. He confesssd he liked the gum tree, still he would be glad to see some of our old English trees also,—not in such numbers, however, as to overshadow the native trees, as the characteristic foliage of the Colony ought to be carefully conserved.

Mr. Stephens remarked that the preliminary operations, such as the clearing out of the old trees and opening out vistas, should be entered upon with great care and judgment. These should indeed be supervised by a Committee of Taste. Government was probably afraid of the expense, but if the Royal Society were simply authorised to carry out the work according to a definite plan, he had no doubt it could be done at a very small expense. He did not agree with a suggestion which had been thrown out as to planting isolated trees here and there, without much preparation of the ground. If the ground were not thoroughly trenched, the trees would grow small, stunted, and the reverse of ornamental. Even if English grass seed were to be sown over the Domain, the ground should be properly prepared for its reception.

Mr. Rule doubted if any more carriage drives were necessary, and did not think the people generally would care to subscribe, as had been suggested, for these. If any were to be made, he thought those who would make use of them should construct them. He quite agreed with Mr. Barnard in thinking that our native and distinctive trees and foliage should be carefully preserved, and that the ground generally should be kept as nearly as possible in a state of nature, and not reduced to the condition of an artificial park or garden.

Mr. GRANT suggested if Government was asked for permission to allow the Superintendent of the Society's Gardens to undertake the work, it would be granted at once. Private subscriptions might be got up for the expense of fencing, and the whole might be under the direction of a committee chosen from the Council.

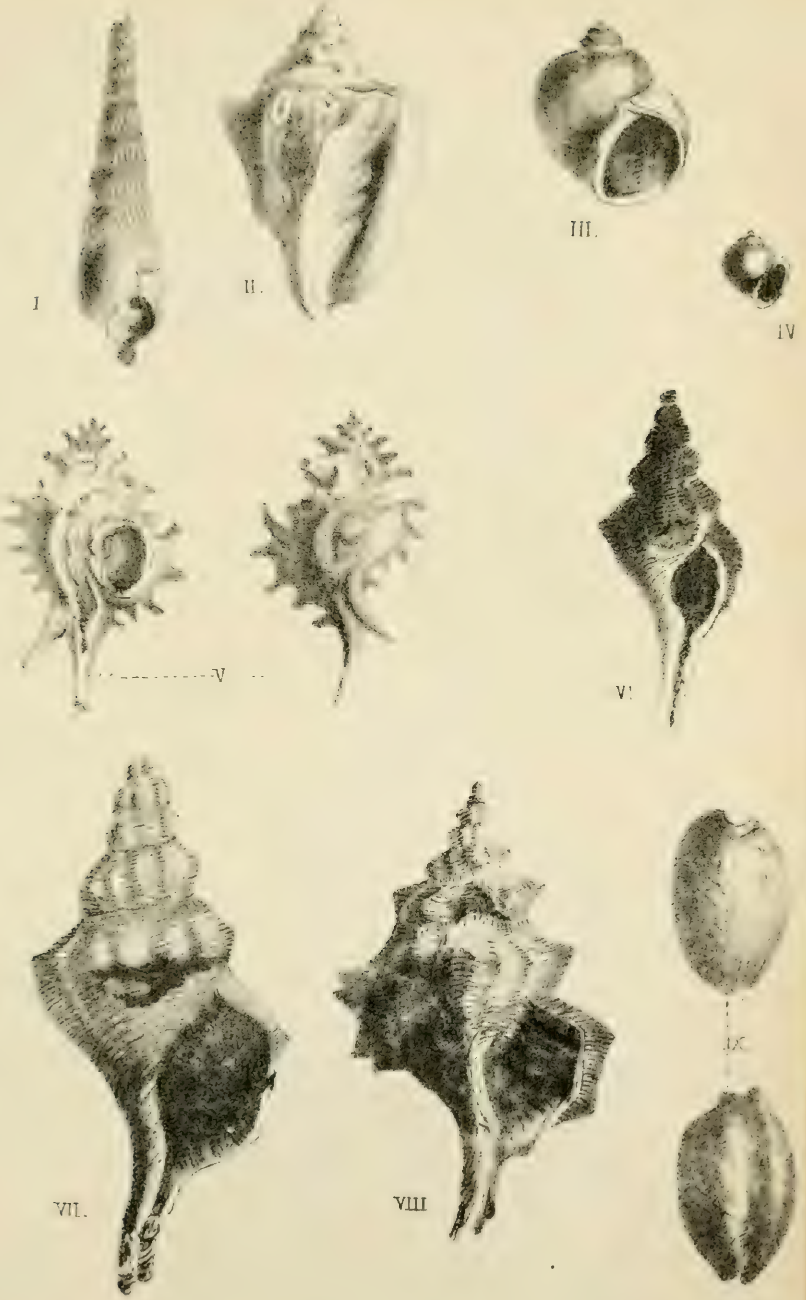
Mr. RULE thought the suggestion might be acted on, and proposed that Mr. P. T. Smith, Mr. M. Allport, Mr. Stephens, and Dr. Agnew be appointed as the committee.

The motion was put from the chair and carried.

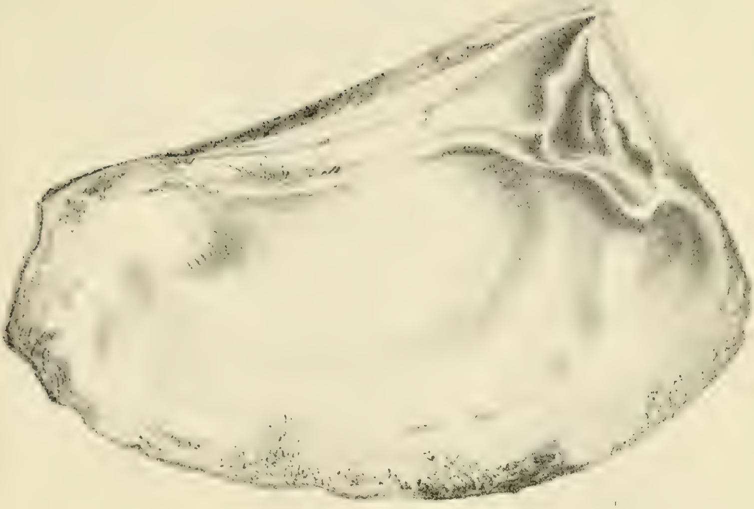
A vote of thanks to the donors of presentations closed the proceedings.

FIGURES OF TERTIARY FOSSILS FROM TABLE CAPE TASMANIA.

No. I.—Torebra simplex	*(Woods)*
II.—Voluta Weldii	,,
III.—Natica Wintlei	,,
IV.——— polita	,,
V.—Typhis McCoyi	,,
VI.—Fusus Meredithiæ	,,
VII.——— Roblini	,,
VIII.—Tritton Abbotti	,,
IX.—Cypræa Archeri	,,
X.—Venus Allporti	,,
XI.—Crassatella oblonga	,,
XII.——— aphrodina	,,
XIII.—Lyonsia Agnewi	,,
XIV.—Solecurtus Legrandi	,,



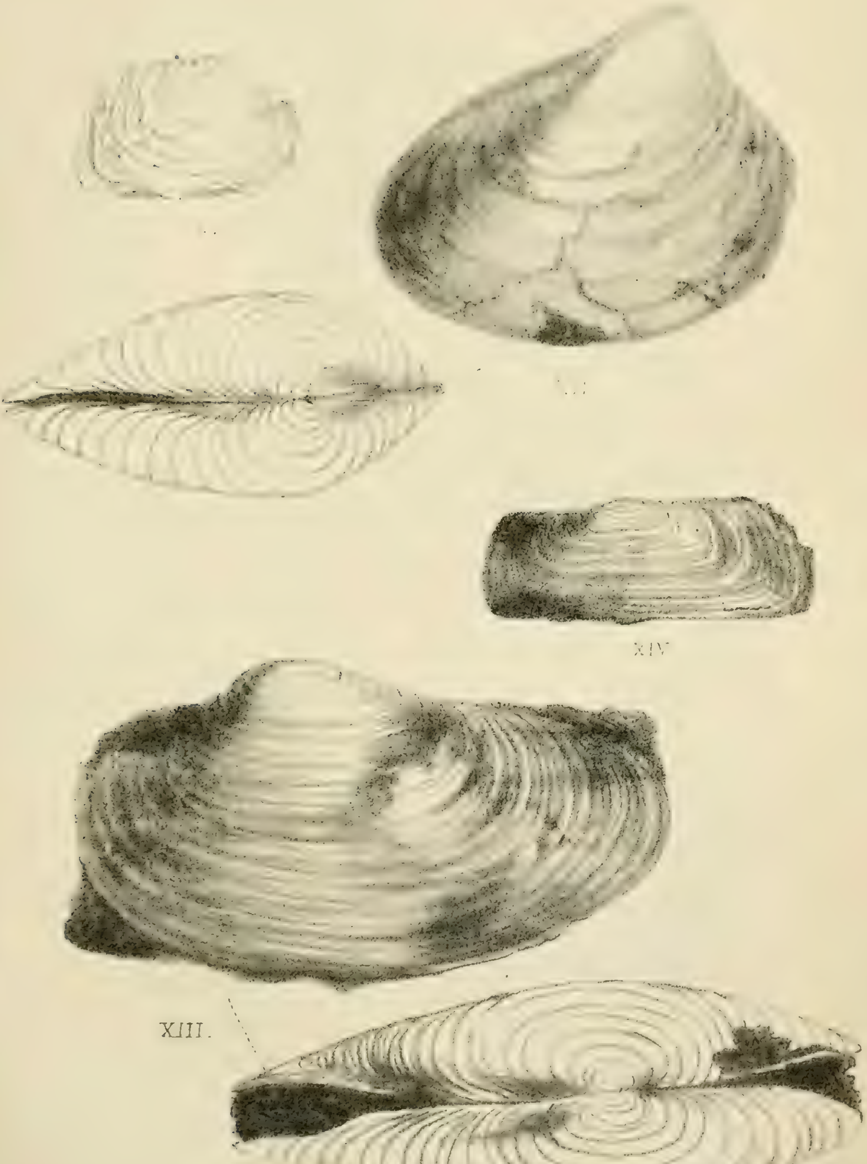
L.A. MEREDITH DEL. ET LITH.



XI

[illegible] Lith

L. Henn & Co Lith.



L. A. Meredith Del et Lith.

L. Henn & Co. Lith.

ON SOME TERTIARY FOSSILS FROM TABLE CAPE.

By the Rev. J. E. Tenison Woods, F.L.S., F.G.S., &c.

[Read 9th March, 1873.]

My attention has been called to some fossils in the Museum of the Society, which are alleged to have been collected close to the sea-side at Table Cape. They were presented to the Society by Dr. Milligan, and consist of remains taken, as far as I can judge, from three different deposits. In perusing the transactions of your Society, I do not find that an attempt has yet been made to determine the relations of these beds to similar deposits in Australia. Neither can I learn that a classification of the imbedded remains has been attempted. The following observations on the subject may, therefore, be of some little value.

Most of the members of the Society are probably aware that extensive tertiary deposits are found in Australia. They are, as far as known, restricted to the southern portions of the continent. From Carpentaria I have seen fossils from quarternary raised beaches, and also similar fossils from Perth in Western Australia. Generally the eastern, northern, and south-eastern portions of the continent are occupied by Palæozoic rocks, and this seems to be the case in Western Australia. The series of tertiary rocks in Southern Australia is very complete. Commencing in the west side of the Great Australian Bight, they are but little interrupted until the high land of Cape Otway is reached. The only interruptions are, granite outcrops about Fowler's Bay, Port Lincoln, &c., and the axis of the Flinder's range, which terminates at Cape Jervis. Upon the flanks of all these, up to a certain height, the tertiary rocks rest.

In some places, such as the Australian Bight, the beds are nearly 400 feet in thickness, which give almost at one glance a conspectus of the whole of our tertiary formations. Between Warrnambool and Cape Otway there are equally perfect series, but not superimposed. It will very much elucidate what I have to say in this paper if I give an abstract of Mr. Wilkinson's report on geology of the Cape Otway district. (See Reports of Geological Survey of Victoria.)

"The carbonaceous range which rises near Loutit Bay reaches 2,000 feet, 12 miles north of Apollo Bay, and which again falls to Moonlight Head, seems to have been an elevated portion of the sea bottom during the deposition of the miocene strata. From position and the horizontal manner in which the upper beds of the series repose on the flanks of the range, I am inclined to believe they never wholly covered it. This formation occurs, at intervals, round the dividing range to

Moonlight Head and thence to Cape Otway. Though not again seen to the east of the Cape for more than 40 miles, there can be little doubt that it was once continuous from Moonlight Head, to Point Addis. The cliffs on the coast near Spring Creek, 16 miles south of Geelong, expose a thickness of about 300 feet of miocene strata. The upper portion of the series is nearly 100 feet in thickness, consisting chiefly of yellow sandy limestone, the calcarious portion composed almost entirely of polyzoa and fragments of echini spines. The characteristic fossils are *Cellepora Gambierensis*, Busk, *Hemipatagus Forbesii*, Duncan, and the little *Terebratula compta.* Sow.—The middle series, which is about 150 feet thick, consists of soft, blue, brown, or yellow sandy clays. Bivalve shells are characteristic of these beds, the most common of which are *Pectunculus laticostatus*, Quoy. The fossils from the lower beds Professor M'Coy regards as belonging to the Upper Eocene.

" We find next Miocene occupying the base of the cliffs, about a mile and a half west of the Aire river. Here occurs a plant bed 17ft. thick, containing fossil leaves. This bed consists of dark, almost black, argillaceous clay, with crystals of selenite, and the crevices filled with a yellow substance, determined to be basic sulphate of iron. This bed rests on miocene strata, with fossils soon covered over with more recent tertiary fossils, almost exclusively polyzoa, and a large *Pecten* (*Hinnites Coriensis* M'Coy ?) Here a fossil seal's tooth was found *(Phocodon Wilkinsoni* M'Coy ?) which Professor M'Coy regarded as belonging to the same species as that found in the miocene of Malta."

I need not quote the abstract further. I only want to draw attention to the leading tertiary deposits found in Australia.

1. The polyzoan limestone, with *Hemipatagus Forbesii* and *Cellepora Gambierensis.* 2. Brown clays and sandstones, with *Pecten laticostatus*, &c. 3. Plant beds, with leaves of species not belonging to the existing flora, highly ferruginous, and interstratified with mud, sand, lava, and volcanic ash.

The fossils in the Museum of the Society appear to me to be taken from beds belonging to the lower part of No. 1, and the upper part of No. 2. There are also plants taken from a bed similar to No. 3, and I have but little doubt that the plants recently described by Mr. Johnson in your last year's Transactions will be found to belong to the same age. I now proceed to describe the fossils.

1. *Cellepora Gambierensis* Busk.—This fossil was named by Dr. Busk sixteen years ago, from specimens furnished by me ; but as no diagnosis has ever been given, I proceed to describe the species myself. Polyzoary, large cylindrical branching

irregularly, branches hollow, rarely encrusting, cells inflated, irregular, with large avicularium at each side of mouth, probably a socket for a vibraculum above.

2. *Hemipatagus Forbesii* Duncan.—Ann. Nat. Hist., vol. xiv., p. 165.—I regard the above two fossils as very characteristic of the upper (so-called Miocene or lower Pliocene beds of Australia.) They are never found mingled with the lower fossils, except in intermediate beds, and then only sparingly, as in the present case.

3. *Pecten laticostatus* Quoy.—This shell is still a common existing species in New Zealand, from whence I have received specimens; I believe from Dunedin or Invercargill, Middle Island.

4. *Dentalium Kicksii* Nyst.—This shell is described in Nyst's Coquilles, &c., des terrains tertiaries de la Belgique. As the work is scarcely accessible to Tasmanians, I give his diagnosis, *D. testa tereti, subarcuata, longitudinaliter striata, striis irregulariter dispositis.* He adds that this fossil is quite distinct from *D. striatum* Sow. of the London clay, though somewhat like *D. grande* and *D. Bouei* of Deshayes, Paris basin. The ends of all the species seen were constantly broken.

Dentalium long and narrow, finely streaked lengthwise. Striæ variable in number and position, and sometimes a vacant space or groove instead, sometimes irregularly placed between slightly elevated narrow and sharp ribs, prolonged along whole surface, and variable in number. Numerous transverse striæ indicating lines of growth.

6. *Waldheimia.*—This species was described by me in the Transactions of the Adelaide Philosophical Society, and figured by that Society in 1866. I find the synonym *W. macropora* M'Coy attributed to a specimen in the collections of the Victorian Geological Survey. It is very common in the Murray beds, and in the Geelong miocene.

7. *Rhynchonella lucida* M'Coy.—I think the species found at Table Cape will be found identical with *R. lucida* of M'Coy. It is common in the Geelong beds, and though probably now an extinct species, one like it occurs in the tertiaries of Spain in the glacial deposits, in the Norwich Crag (pliocene), and is still living in Australia: that is, *R. psittacea* Sowerby.

8. *Cucullœa concamerata* Reeve.—Very common in No. 2, Australia, and many specimens here. Living at present in the Mauritius seas, Nicobar, China. Figured by Sowerby, Gen. Char. Shells, Vol. 1, and in Woodward's manual.

9. *Cypræa eximia* Sow.—This shell was described by Sowerby in Strzelecki's New South Wales, &c., from a specimen said to have been found in a well at Franklin village, 130 feet below the surface. This, I presume, is near Laun-

ceston, not Franklin, at the Huon, where the surface rock is volcanic tertiary dolerite. It would be very interesting to ascertain if the tertiary formation is found at great depths in the southern part of the continent, though *a priori* we might conclude it would be so. I append a translation of the diagnosis as the work is not generally accessible. Shell, ovately ventricose somewhat thickened, smooth polished, produced anteriorly and posteriorly, anterior prolongation the longest with two dorsal tubercles; posterior slightly reflexed; spire with two conspicuous whorls; aperture long, narrow, sinuous, canaliculate at each end; the posterior slightly ascending; external lip toothed in its interior margin; the posterior teeth small, anterior somewhat inconspicuous and interrupted; the internal lip with sharp transverse sulci on the inner margin, the interstices thicker and longer anteriorly, basal sides thickened at the extremities snd somewhat margined above. Mr. Sowerby adds:—" A fossil cowry of very remarkable form, bearing but a slight resemblance to any known species. It slightly resembles *C. Scottii*, but distinguished by its lengthened anterior and posterior canals, and by the two tubercles on the posterior dorsal part of the anterior canal, and by the very remarkable grooves or ribs of the inner edge of the inner lip.

I may add that the fossil is not uncommon in the Victoria Upper Tertiary, though it occurs in the lower beds as well, having a wide range.

10. *Trigonia semiundulata* M'Coy.—I take this name from the collections of the Geological Survey, Victoria, though no diagnosis has been published. The species is very common in the middle tertiaries of Victoria, and is easily recognised by half the ribs on the shell radiating, and half being concentric. In this respect it resembles a fossil British Oolite species, *Trigonia costata*.

Corbula sulcata, Lamarck.—This species is still living on the west coast of Africa, as Prof. M'Coy (see Annals of Nat. Hist. for 1866) has pointed out. It is very characteristic of the Australian Lower Cainozoic. It is figured in Woodward's Manual, pl. 23, fig. 2; there are also excellent figures in Martini (Chemnitz) pl. 172, fig. 1668 to 1671. Habitat of living species, Senegal, about lat. 16 N.

Voluta Hannafordia, M'Coy, Ann. Nat. Hist., vol. XVIII., new series, p. 367.

Voluta antiscalaris, M'Coy, loc. cit.

Voluta macroptera, M'Coy, loc. cit.—Several specimens, but few old enough to manifest the peculiar extended outer lip. All these volutes are well known forms in the Australian L. Cainozoic.

Cassidaria reticulospira M'Coy. Exhibition reports, 1866. Victoria.

Ancillaria mucronata. Sowerby Thes. Conch. pt. 63, pl. 211, f. 11.—This species exists in Tasmania, one of the very few forms surviving in the present series. There are trifling variations of character, but not, I believe, of specific value in the fossil form.

Dentalium lacteum ? (Ditrupa ?) Deshayes. Monograph of Dentalium. Living in the Indian seas. This is a doubtful identification. The fossil is very common, and may be a variety only. Another smooth Dentalium is living, and is found fossil in the Vienna basin. (*D. entalis* Linn.) but is very distinct from our species.

Turritella Tasmanica. n.s. (Diagnosis reserved for better specimens.)

Natica ovata Hutton, Catal. Ter. Mollusca of New Zealand, p. 9, No. 61.—This is a Pliocene fossil of New Zealand.

Natica Wintlei. n.s.

Triton Abbotti. n.s.

Fusus Roblini. n.s.

Terebra simplex. n.s.

Typhis M'Coyi. n.s.

Solecurtus Legrandi. n.s.

Crasatella oblonga. n.s.

Crasatella aphrodina. n.s.

Lyonsia Agnewi. n.s.

Venus Allporti. n.s.

Besides fragments of a large Trochus, Haliotis, Corbis, Waldheimia, too imperfect for identification.

Polyzoa are few in number, as well as Foraminifera, but this must not be wondered at, as the deposits are evidently transported from a distance. They are much broken and mingled with coarse fragments of quartz and ferruginous gravel, which seems to have comminuted the softer and smaller particles into fine mud. This mud has even preserved the colour of the shells at times. Thus in the *Solecurtus Legrandi*, which is very closely allied to the existing but larger species in Brisbane, the pink colour of the shell is quite perceptible.

The corals of the deposit are not numerous, but of a larger size than any found in Australia. I have found three described species and two unknown hitherto. They are—

Placotrochus deltoideus. Duncan, Journal of Geological Society, vol. xxvi., p. 300, et. seq.

Sphenotrocus excicus. Duncan, loc. cit.

Conotrochus M'Coyi. Duncan, loc. cit.

The above are well known Australian Lower Cainozoic forms. They are pedicellate corals and very characteristic. I have found none of the eight described Australian L. C. *Balanophyllia*, which give such a peculiar facies to the Australian Tertiary coral fauna, since eight species of one genus, and that a rare one, is a remarkable palæontological fact. There is, however, a large cylindrical and much branched Balanophyllia, with a dense rugose epitheca and peculiar systems of cycles, which, I have no doubt, will prove most interesting to science when determined, as it will be, by our greatest living authority on corals, Prof. Duncan. There is also a coral of the Heliastræan type, which is also new in Australian palæontology. Both have been sent to Europe.

Amongst the Forminifera identified, we have *Textularia pygmea*, *T. agglutinans*, *Cassidulina oblonga*, *Rosalina bertholetiana*, and some few others, all evidence of deep water, say from 200 to 300 fathoms.

From the foregoing facts there can be little doubt that we have in Northern Tasmania a portion of the great tertiary formation which occupies so much of the Southern Australian continent. From this we may conclude that Tasmania has shared the general upheaval, of which there is so much evidence as occurring in the continent during tertiary periods. Until the beds have been carefully examined it will not be competent for any one to hazard an opinion as to whether the upheaval in Tasmania has been greater or less than that observed in Australia, and whether now continuing or followed by subsidence. The position of the beds is in longitude eastward of any deposits in Australia, and proves one more link to the union of these beds with the great tertiary formations of New Zealand. There can be but little doubt also that the tertiary leaf beds, which Mr. Johnson has lately described in so interesting a manner, form a part of this upper tertiary formation, and are connected with similar deposits near Cape Otway. A careful examination by a competent botanical Palæontologist would lead, no doubt, to the most interesting results.

As to the age of the beds, I cannot do better than append the published opinion of Dr. Duncan, one of the secretaries of the London Geological Society, whose kindness and industry in attending to all my communications on the subject of Australian tertiary fossils have led to the great progress which Australian Palæontology has lately made. I may add that to him, Professor M'Coy, Professor Etheridge, and Mr. Moore, F.G.S., we owe nearly all we know of the fossils of Australia.

In the Quart. Journ. Geo. Soc., Vol. 26 p. 313, he says that the corals of the Australian tertiaries are very characteristic. They were not reef builders, but forms which tenanted the sea bottom from low spring tide, much to the depth where polyzoa abound. The species of the different beds have so great a general resemblance, that they do not offer evidence of any biological changes during the deposition of the whole. He points out that it is inconsistent with the rules of geological classification to subdivide the series into Oligocene, Lower, Middle, Upper Miocene and Pliocene, which in Europe have very distinct fauna. The percentage system cannot yet be applied to Australian beds, as the Mollusca existing are so little known, and a comparison of the corals would make them older than the evidence of the physical geology warrants. There was evidently in these periods much disturbance and alteration of currents in the sea bottom, formed of Silurian rocks, basalts, and carbonaceous sandstones; conglomerates, pebbly sandstones, clays and clayey sandstones alternated under different conditions during a vast period of subsidence connected with the outpouring of trap rocks, covering littoral deposits and the gradually denuded rocks. The leaf beds show temporary upheavals. The relations of the leaf beds, clays, gypsum and basic sulphate of iron, so frequently seen in Europe, are repeated in Australia. The chemical decomposition of these beds accounts for their contortion. No other disturbance is manifested in Australia in which the beds contrast with the changes to which the tertiaries of the West Indies, Europe and Sindh have been subjected.

Dr. Duncan thinks that during the long duration of time during which Australia was a sea, there was open water to the north, with reefs in the lava district and corresponding formation, opening into what is now the Mediterranean, and the Sahara to the north-west. The Indian peninsula, and the area now occupied by the Himalayas, and stretching far away to the east, were not a part of a great continent. The greater part of the American continent was submerged, and the Carribean Sea was a coral sea. He then suggests that the bulk of land must have been to the extreme north and south of the globe. Australia and New Zealand, he adds, were bounded on the north by a coral sea, and on the south by a deep sea, as now. In this way he accounts for the persistence of earlier types in Australia, and its perfect disconnection from Europe in its present and existing fauna and flora. For though corals are known to have an enormous range, very few are common to Australian and European tertiaries. "The absence of any littoral connexion between Australia and the points to the north in the tertiary period, and the remoteness of the south of its area from any great centres of frequent terrestrial oscillations, may explain the persistence of type." This persistence was infinitely less in Europe on account of the more frequent changes in its physical geology. The distinct and comparatively quiet area of Australia was hence tenanted by the same species, whilst vast biological and geological changes took place in the European area, formerly considered the type by which all others would be compared. He adds that the extinction of Australian volcanoes, and the change in its coral flora, were grand phenomena, which he also regards as contemporaneous with the upheaval of the Alps, Himalayas, New Zealand, and the closure of the Isthmus of Panama. He points out the enormous denudation of the Australian area from the thickness and extent of unfossiliferous deposits which cover the marine. During the glacial period of Europe, he supposes that subaerial denudation went on. The gold drifts, sandy ferruginous clays, coarse pebble grits, and hard ironstone, cements and conglomerates with the lava plains north of Cape Otway, are of this age, and younger than the polyzoic limestones.

To all these conclusions I would readily subscribe, except to that portion which supposes Northern Australia completely submerged, and no land to have been north of the tertiary sea. The following are facts on the subject:—1. The tertiary marine fossiliferous beds thin out rapidly as they are followed north. In the south-east portion of the continent this occurs in a few miles, and in any case they are not known further than 30deg. S. lat. 2. The enormous development of upper secondary beds in the north of the continent, and their complete absence from the south. This seems to show that North Australia has escaped the general tertiary denudation, which would not have been so had these beds been submerged. Besides, they are very soft in character, and so horizontal, that they do not appear to have suffered any disturbance in tertiary periods. Thirdly, the only tertiary rocks which are found in North Australia appear to be either subaerial or lacustrine. Last of all, the physical geology of the tertiary deposits serve to show that the sea encroached upon the present area of Australia in a great horse shoe form, and that the contour of the continent gives a good general idea of the shape of the great tertiary sea basin. Add to this that the flora and fauna of the land seem to be a connecting link with the secondary fauna and flora of Europe, which is very easily understood, if we suppose a part of the Australian continent to have been undisturbed. South Western Australia possesses these features in the most marked way, and this is the portion of the land, too, where the physical geology is against the supposition of any submersion.*

* Dr. Hooker says the Australian orders (abundant there and rare elsewhere) are very unequally distributed in Australia. There is a greater specific difference between S.E. and S.W. Australia than between Australia

In conclusion, Dr. Duncan suggests that the word "Tertiary" should only be used relatively in Australian geology, but all above the carbonaceous sandstones should be called Cainozoic; but this, I presume, is for Victoria and South Australia, as there is a full series of intermediate Mesozoic rocks in Queensland, and probably Western Australia. He would refer all below the Mount Gambier limestones to Lower Cainozoic. That deposit he would call Middle Cainozoic, and all above Upper Cainozoic. The Table Cape beds should therefore be called Lower Cainozoic. He says that the tertiaries of New Zealand should be studied in relation to those of Australia, and he regards the polyzoic limestones of the North Island as the equivalents of the Mount Gambier Middle Cainozoic. "At present," he says, "all that can be arrived at, concerning the relative position of the Australian tertiaries, is that they were formed on a sea bottom of the oldest rocks in increasingly deep water, during a period when the denudation of the neighbouring coast line to the east and north-east was rapid. They were very distinct from the reef area of the period, and the physical conditions of such an area were never present during the deposition of these beds, which have a facies characteristic of all the European marine tertiary deposits above the nummulitic. They were subjected to frequent volcanic outbursts, which covered large areas with basalt and ash, and they were covered after the general upheaval of the centre of Australia with lacustrine, dune, river and torrent deposits, whose depth testifies to the enormous denudation of the older rocks. The condition of the *high land* on the extreme *east and west of Australia* was probably *that of dry land* during *the whole Cainozoic period*, and these districts probably bounded the tertiary sea."

The italics are my own, as I wish to indicate those conclusions which are borne out by all that Australian geology has taught me in many years' investigations.

DIAGNOSIS OF NEW SPECIES.

Fossils from Table Cape.

(Note all measurements in French millimetres.)

Terebra Simplex, n.s. *T. testa fusiformi-turrita, acuminata, striis numerosis, flexuosis, tenuibus, transversalibus : anfractibus planulatis superné, sutura vix impressa; apertura angustata; columella contorta, recurva, basi emarginata, labro angusto.*

Anf. 13. Long 50 mil. Lat 11 mil. T. shell terete, smooth, without grooves, finely wrinkled, with undulating transverse

and *the rest of the globe*, and the most marked characteristics of the flora are concentrated at that point, which is geographically most remote from any other portion of the globe.—*Flora of Tasmania.* The Introd.: xxxiii.

lines, suture overlapping, aperture narrow, columella arched, twisted and recurved at the base, outer lip sharp.

A very simple shell with smooth whorls. The specimen in the museum has mottled brown spots at the suture, which seem very much like the traces of former coloring. There is no described species at all like it.

TYPHIS M'COYI, n.s., *T. testa ovato-oblonga, fusiformi-lævigata, quadrifariam varicosa ; varicibus spinosis* (*ult. anf. spin.* 5) ; *anfractibus convexiusculis, tubiferis ; ultimo anfracto canali longo, angusto, arcuato, clauso, terminato ; apertura ovata, integra ; labro incrassato, varicibus* 2 *et* 3 *canali recurvo terminatis.* Long 38 mill. Lat. 22. Anfr. 7.

T. shell ovately oblong, fusiform, smooth, with four spinose varices in each whorl (5 spines on each of the varices of the last whorl) whorls convex, tubiferous, last whorl terminating in a long narrow recurved closed canal, mouth ovate entire, with a thickened lip, second and third varices uniting into a recurved canal.

This fossil is somewhat near the *Murex tubifer* Brug. of the European eocene at least as far as Nyst's figures and descriptions guide. Brugière says (Encycl. Method.) that the species is living in Ceylon, but no such shell is figured in Reeve or Sowerby. The nearest congener in Southern deposits is the *T. Zealandica*, Hutton, of the Wanganui Pliocene, but it is very distinct.

FUSUS ROBLINI, n. s. *F. testa contorta, fusiformi, anfr. tenuiter longitudinaliter sulcatis et striatis, superne ad angulum plicato-tuberculatis, tuber., acutis, subdistantibus (in ult. anfr.* 13) *apertura elongato-pyriformi, superné angulata, columella contorta, canali recurvo.* Long. 75. Lat. 37. Añfr. 7.

F. shell twisted, fusiform ; whorls finely spirally sulcate and striate, whorls seven, with a row of sub-distant somewhat sharp tubercles on the outer sloping margin, which is there angulated; tubercles 13 in body whorl, aperture elongately pyriform, columella twisted, canal recurved. I have named this species which is very distinct, after Mr. Thos. Roblin, the industrious curator of the Society's Museum, whose ready and prompt assistance has been of the greatest service to scientific investigators.

FUSUS GRACILLIMUS, n.s. *F. testa lanceolato-fusiformi, gracillima, solidiuscula, transversim striata et sulcata*; *striis subtilibus, confertis, nodulosis ; sulcis peculiariter plano-excavatis ; longitudinaliter costatis ; costis brevibus interruptis ; anfractibus convexis ; apertura angusto-ovata, superne angulata cauda prælonga, aperta, gracili terminato.* Anf. 8. Lon. 33. Lat. 12.

F. shell, lanceolately-fusiform, most graceful, somewhat solid, transversely striate and sulcate ; striæ very fine, close and nodulose ; sulci in peculiar flat grooves: ribbed lengthwise, with short interupted costæ, whorls convex, angulate above, terminated by a long open graceful canal.

This beautiful fossil is very near to *Fusus acris* (Reeve and Adams) of the China seas, and *F. longirostris* of the Vienna basin. If many of each species were put together I have no doubt gradations from one to another would readily be traced. They may be identical. Many miocene forms exist still in China, and some of the European types closely approximate to those living in the Eastern seas.

NATICA WINTLEI, n.s. *N. testa canaliculato-umbilicata, obliqué globosa, subtus concava, solidiuscula ; spira elongata, apice acuta ; anfractibus rotundatis, tenuissime striatis ; apertura lunari-ovata, callositate parva, columnari umbilicum, vix intrante.* Anfr. 5. Long. 25. Lat. 19.

N. shell canaliculately-umbilicate, obliquely globose, concave beneath, rather solid, spire elongate, whorls rounded, apex acute, very delicately striate, aperture lunately-ovate, columnar callosity small and only slightly entering the umbilicus.

This fossil I have dedicated to Mr. Wintle, who has long and industriously worked amid the Tasmanian rocks.

NATICA POLITA, n.s., *N. testa parva, nitida, ventricosa, subglobosa, umbilicata, fragili, levigata, transversim substriata, long. lineis obsoletis fasciata ; anfractibus* 5, *subglobosis, ad sutur. profunde canaliculatis ; apertura ovato-semilunari, margine sinistro reflexo, dextro tenui acuto.* Anf. 5. Long. 13. Lat. 11.

N. shell small, shining ventricosely sub-globose, umbilicate, fragile, smooth or transversely substriate, banded with obsolete lines, suture profoundly canaliculate, aperture ovately semilunar, left margin reflexed ; right thin acute.

This shell is very different from any existing or extinct species, coming nearer to some European Eocene fossil forms than any other.

CYPRÆA ARCHERI n.s. *C. testa ovato oblonga, lævigata, medio inflata, utrinque sub-attenuata, antice subrostrata, postice attenuata, utrinsque emarginata, spira vix cooperta: apertura basim versus latiore ; dentibus parvis, numerosis, subaequalibus,* long. 23, lat. 14.

C. shell ovately oblong, smooth, inflated, somewhat attenuate at each end, slightly rostrate above, attenuate below, emarginate at both ends, spire not quite covered, aperture broader towards the base and furnished on both lips with numerous sub-equal teeth.

This fossil is not very different from *C. sanguinolenta* Gmelin (in Lin. Syst. Nat., p. 3406, N. 38) which is found in the miocene faluns of Touraine and in the Vienna basin. Compared with Haidinger's figures, the difference is slight, but the actual fossils side by side are very different. I have named this after my esteemed friend, Mr. W. H. Archer, the learned Victorian statist, whose labours in every branch of science are well known.

Triton Abboti, n.s., *T. testa elongata, acuta, turrita, varicibus tribus, longitud. striatis, striis plus minusve interruptis vel nodosis, (ad lab. et canal. regulariter alternatis); anfractibus irregulariter convolutis, globosis, angulis tuberculisque biseriatim armatis; ultim. anfract. canali longo, arcuato, recurvo, aperto, terminato; apertura ovata integra, labro incrassato, intus denticulato.* Long. 50. Lat. 30.

Triton shell elongate acute, turrited, with three varices, spire-twisted, whorls globose, armed with two sharp angles, on which are a series of sharp tubercles, the upper larger, 12 in first whorl, the lower becoming very small and obsolete at the outer lip, shell long. striate, the striæ becoming obsolete or dotted, at the mouth on alternate lines; last whorl terminating by a long, open, arched, and recurved canal, aperture entire, outer lip denticulate interiorly.

This shell I have dedicated to Mr. F. Abbott, the curator of the Royal Society's gardens. It is common. As in other shells in these beds, there are distinct traces of color on the shell, which has a bluish ground, with brownish square spots in zigzag lines.

Crassatella aphrodina, n.s. *C. testa trigono-ovata, obliqua, tumida, crassa, tenuiter striata et sulcata, umbonibus sulcatis angustis; lunula impressa, latere postico subangulato, productiore.* Long. 53. Lat. 44.

C. shell ovately trigonal, oblique, solid, faintly striate and sulcate, umbones sharp, with more distinct sulci, lunule impressed, posterior side subangulate and prolonged.

Voluta Weldii, n.s., *V. testaovato-conica, ventricosa, solida, long. tenuissime striata, spira conica, mammillata; anfractibus ad angulum tuberculis acutis coronatis (tuber. ultim. anfr. 9); apertura angusta; labro simplici, crassiusculo, superne emarginato; columella arcuata, medio 4-plicata; callo magno.* Long. 41. Lat. 22. Anf. 8.

V. shell ovately conical, ventricose, solid, long. finely striate; spire conical, mammillate; whorls with sharp-edged tubercles at the angle (last whorl 9, and coming towards the middle of the whorl near the aperture), aperture narrow, lip thickened, simple, emarginate above, columnella somewhat curved with four plaits in the middle, enamel, widely spread over the lower part of the shell.

This shell is very near Nyst's *Voluta depressa* Lam. (See Nyst Recherches sur les coq. foss de Hoesselt et de Kleyn Spauwen. p. 37, no. 29, et pl. iv., fig. 99.) It is a miocene form common at Bordeaux. Our shell is however thicker, and the four plaits on the columella show its distinctness, though it adds one more to the many instances of mimetism, that is to say, forms, which seem closely approximate to types in contemporary European beds. This is especially seen in the volutes, which Professor M'Coy was the first to point out in describing *Voluta antiscalaris.* The only living form at all near it is *V. flavicans* Gmelin, which is Australian.

LYONSIA AGNEWI n.s. *L. testa ovato-transversa, inæquilateralis, convexa, concentrice striata et sulcata; latere postico attenuato-rotundato, antico oblique producto, latiore, aperte antice et postice hiante.* Long. 82. Lat. 1. 44.

L. shell transversely ovate, inequilateral, somewhat solid, convex concentrically striate and sulcate, posteriorly attenuately rounded, exterior obliquely produced, broader, gaping at both ends.

This fossil I have dedicated to Dr. Agnew, secretary of the Society, to whose indefatigable labours the flourishing state of the Society is owing.

SOLECURTUS LEGRANDI n.s. *S. testa polita, oblonga, inæquilateralis, latere postico elongato, utrimque subtruncato, hiante, medio et postice oblique sulcata, sulcis prope marginem dorsalem retrosim angulatis.* Long. 44. Lat. 19.

S. shell polished oblong inequilateral, prolonged posteriorly, subtruncate at both ends, gaping, obliquely grooved, grooves angularly turned back near the dorsal margin and radiating from the umbones towards the margin.

This fossil is very near to the *Solecurtus Australis* of Dunker, which now inhabits N. Australia; it is, however, smaller. Traces of the pink color of the shell are plainly visible. I have dedicated the species to Mr. W. Legrand, of Hobart Town, the learned conchologist, whose most painstaking enquiries into our living molluscan fauna have resulted in his monograph of Tasmanian land shells, besides many additions to the marine fauna. I have also thankfully to acknowledge the assistance I have received from him in preparing this list.

CRASSATELLA OBLONGA, n.s. *C. testa ovato-transversa, inæquilateralis, crassissima, convexa, transversim sulcata, sulcis posterioribus tenuibus, latere postico angulato, sinuato.* Long. 93. Lat. 67.

C. ovato trigonal, inequilateral, very convex, obliquely truncate behind, closely concentrically ribbed, the ribs becoming fine striæ on the posterior flattened portion, hinge large thick, lunule impressed, with a distinct ridge from the umbo to the base of the truncated flattened posterior margin.

This shell which is very distinct from any existing species, and very large, is somewhat similar in form to *C. attenuata,* Hutton of the Lower Miocene, New Zealand. It is apparently rare.

VENUS ALLPORTI n.s., *V. testa ovata, obliqua, anterius angulata, subdepressa, tenuissime striata, albida, lamellis transversis, subdistantibus, appendiculatis.* Long., 29. Lat., 19.

V. shell ovate, oblique anteriorly, angulate, subdepressed, slenderly striate, white, with transverse subdistant appendiculate lamellæ.

This shell which very closely resembles *V. lamellata* var. *subdepressa* of Lamarck (1st edit. Hist. des Moll. Vol. 1, p. 349). It is, however, a smaller shell and more irregular in the lamella and not striate on the anterior side of the same. There is but one specimen of this fossil in the Museum, and that very much damaged. It is possible that a larger suite of specimens may show it to be identical with the living form whose habitat is Tasmana.

ON SOME NEW SPECIES OF TASMANIAN MARINE SHELLS.

By Rev. J. E. Tenison Woods, F.G.S., F.L.S., &c.

[Read 13th April, 1875.]

The following species of marine shells have been placed at my disposal for description by Mr. W. Legrand, the well-known conchologist of Hobart Town. They were all procured recently in a series of dredging operations, conducted by the Rev. H. D. Atkinson, in Long Bay, D'Entrecasteaux Channel. They are eight in number, comprising three species of Marginella, and one species respectively of the genera. Triforis, Odontostoma, Eulima (?) Neæra, and Cardita. Apparently they have hitherto escaped the attention of naturalists, owing no doubt to their very small size, and probably also because dredging in the interests of conchology has been almost untried in Tasmania. All the shells have an Australian *facies*, that is to say, they are all more or less allied to those species which are characteristic of Australia. The Odontostoma seems to me, however, inseparable from a well-known miocene fossil. It would be interesting to find well-proved instances of survivors from the extinct cainozoic fauna of Europe. Analogy would lead us to look for the survivors here, and further investigation may show that the search has not proved in vain. The following is the diagnosis:—

1. Cardita Atkinsoni, *nov. spec. C. testa parva, fusca, suborbiculato-cordiformi, sub-obliqua, 16-costata; costis radiantibus, nodoso-imbricatis, lunula obsoleta.* Long. 13. Lat. 12. millimetres.

C. shell small dusky, suborbiculately cordiform, sub-oblique, 16-ribbed; ribs radiating, nodosely imbricate, lunule obsolete.

This shell has, at the request of Mr. Legrand, been named after the Rev. H. D. Atkinson, who has given much attention to dredging investigations. The shells are rather common, but found in few other places besides Long Bay.

2. Neæra Tasmanica, n.s. *N. testa parva, fragilis, sub-fusca, transversa, tenuis, inequivalvis, clausa, transversim regulariter sulcata; sulcis paucis, latere antico rotundato, postico rostrato.* Long. 5. Lat. 3. millimetres.

N. shell, small fragile, dusky, thin, *inæquivalve*, closed, regularly transversely sulcate, sulci few, anterior end rounded; posterior prolonged or rostrate. Long Bay, 6 fathoms. The small size and regular sulci of this species easily serve to distinguish it. Rare.

3. Marginella minutissima, n.s. *M. testa, minutissima, ovata, ovuliformi, nitente-fusca, spira immersa; anfractibus superne productis; labro modice incrassato; apertura curvata; columella triplicata, superne obsolete dentata.* Long. 3. Lat. 1. millimetres.

M. shell ovate, most minute, ovuliform, shining fawn color, spire immersed, whorl produced above, lip moderately thickened, aperture curved, columella tri-plicate, and above obsoletely unidentate. Dredged at a depth of 6 fathoms. A single specimen, the only one seen during many years' collecting in Tasmania by Mr. Legrand.

4. Marginella Allporti, n. s. *M. testa parva, ovato-turbinata, nitida, anfractibus superne sulcatis, spira conica, exserta; labro incrassato, superne emarginato; columella 4-plicata, apertura ad basin latiuscula; albofusca pallide tri-fasciata.* Long. 9. Lat. 5 mill. Anfr. 4.

M. shell small, ovately turbinate, shining, whorls sulcate above, spire conical, exsert, outer lip thickened, emarginate above, columella distinctly 4-plicate, aperture slightly wider at the base, color whitish brown, with three pale bands. Found in the dredge at the same time as the above, with three other specimens.

5. Marginella Tasmanica, n. s. *M. testa fusiformi-oblonga, diaphano-alba, nitente, spira acuta, elevata, anfractibus(5) ad angulum callosis, labro rotundato, incrassato, eburneo; columella tri-plicata, exteriusque callosa.* Long. 10. Lat. 4 millim.

M. shell fusiformly-oblong, translucently white and shining, spire acute, elevated, whorls five, suture obliterated by a kind of callosity, lip rotundately thickened, waxy-white, columella tri-plicate, exteriorly callous.

This shell is much smaller and much narrower than *M. muscaria* Lam. with a somewhat sharp spire. It has little or no colour, but the callosity at the suture gives it a white banded appearance round the spire. It has rather a prominent callosity above the columella at the mouth, and resembles *M. muscaria* in the way the outer lip is thickened. Not uncommon in Storm Bay.

4. Triforis Tasmanica. *T. testa, parva, sinistrorsa, elongata, subulata, angusta, acutissima; anfractibus numerosis, planatis, triplici serie granulorum cinctis, ad suturam rufo maculatis; columella contorta, arcuata.* Long. 9 mill. Anfr. 13.

T. Shell small sinistral, elongately subulate, narrow, very sharp, whorls numerous, flat, circled with a triple series of granules at the suture, spotted red between the granules; columella twisted and arched.

Two specimens dredged up at Long Bay.

Odontostoma. This genus was proposed by Fleming in the year 1819 (Edinburgh Encyclop., Art. Conchology) for turriculate subconical shining shells with flattened whorls either smooth or long, or transversely sulcate, aperture suboval, peristome continuous, first two whorls sinistral. Fleming named the shell Odostomia, but Haidinger (Abhandlungen der Kaiserlich-Koniglichen Geologischen Reichsanstalt, 3 band 1856), has pointed out that since the word is derived from the genitive inflexion *οδοντος* and *στομα*, the name should be Odontostoma which I adopt.

5. Odontostoma Tasmanica. n. s. *O. testa, minuta, sub-fusca, elongata conoidea, turrita, lævissima, polita; apice, sinistrorso; anfractibus, 6-8, planiusculis; suturis distinctis; ultimo anfracto subangulato; apertura semi-ovata; columella uniplicata; labro, acuto, intus dentato.* Long. 2 mill.

O. Shell minute elongately conoidal, turriculate, polished, apex sinistral, whorls 6 to 8, somewhat flattened, suture distinct, last whorl subangulate, aperture semi-ovate, columella uniplicate, outer lip acute, and toothed within.

I can find no difference whatever between this shell and the minute shell of our Upper European tertiary (*O. plicatus* Wood in the monograph of Crag, Mollusca synon. *Turbo plicatus* Montague Testacea Britannica, vol. 1, p. 85. Plate 9, fig. 3.) It is probable, however, that an extensive comparison of specimens might show them to be distinct. The present species was dredged up from Long Bay by Mr. Legrand.

It should be remarked that Odontostoma is a synonym of of D'Orbigny (1841) for Proserpina and the name should be carefully distinguished from Odontostomus, separated from Bulimus by Beck, in 1837. The present species seems to be very near *O. nitida*. Alder.

6. Eulima Tasmanica, n.s. *E. testa minuta, sub-fusca, elongato-conoidea, imperforata, lævigata, polita; apertura integra, rotundata; labro incrassato; labio reflexo. Anfractibus* (6) *convexiusculis.* Long. 3 mil.

E. shell minute, dusky, elongately conoid, imperforate, smooth, polished, aperture entire, rounded, outer lip thickened, inner lip reflexed; whorls 6, somewhat convex. Long Bay; 6 fathoms. W. Legrand.

This minute shell is doubtfully referred to Eulima; but there appears to be no other genus now under which it can be appropriately placed. Its somewhat depressed form makes it like the preceding species in shape, but it is a larger shell. Under the microscope, the absence of any folds on the columella, the entire or reflexed lip, readily distinguish it. It is not common.

JUNE, 1875.

The monthly evening meeting of the Society was held on Tuesday, the 8th June. There was an unusually large number of the Fellows present. The chair was occupied by His Excellency the Governor, as President of the Society.

Messrs. W. J. J. Reynolds and F. S. Edgar, who had previously been nominated by the Council, were ballotted for and declared duly elected as Fellows of the Society.

The Hon. Secretary (Dr. Agnew) brought under notice the usual monthly returns, viz.:—

1. Visitors to Museum during May, 1,017.
2. Visitors to Gardens ditto, 2,349.
3. Plants and seeds sent from Gardens:—To Mons. A. Verschaffet, Ghent, Belgium, 12 tree ferns. To Dobroyd Nursery, Ashfield, Sydney, one package of plants. Packages of seeds were forwarded to Mr. C. F. Creswell; Mr. B. E. Heyne, Adelaide; Baron von Mueller; the Department of Agriculture, Washington, United States; the Royal Gardens, Kew, England; Mr. W. Bull, London; the Acclimatisation Society of Queensland; Mr. C. Hollinsdale, Mr. Latham, and Colonel Crawford.
4. Plants and seeds received at Gardens:—From Baron F. von Mueller, seeds of *Vaccinium macrocarpum*, and *Rhus coriaria*. From the Department of Agriculture, Washington, four packets of seeds. From Colonel Crawford, four packets of seeds of coniferæ from India. From Mr. E. B. Heyne, Adelaide, 200 packets seeds. From Mr. C. Hollinsdale, 21 packets seeds. From Mr. T. Johnston, seeds of five species of Palms. From Botanic Gardens, Christchurch, New Zealand, two cases of plants. Through detention in transit, all the latter had perished.

[His Excellency remarked he had recently received a number of plants, many of them of great value, from New Zealand. After reserving a few for the Gardens at Government House, he would be happy to present the remainder to the Society's Gardens.]

5. Time of leafing, flowering, and fruiting of a few standard plants in the Botanic Gardens.
6. Books and periodicals received.
7. Presentations to Museum and Library.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq.—Table for May.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Mount Nelson, from Marine Board.—Ditto.
4. Sydney, N.S.W., from the Government Observatory, printed tables for December, 1874.—Results of observations made during the year 1873.

The presentations to the Museum and Library were as follows:—

1. From Mr. B. R. Dyer, Battery Point.—A Hooded Dottrell (*Ægialites monacha)*, shot at Sandy Bay.
2. From Mr. D. Chisholm.—Casts of Roots of Trees, from the Five-Mile Beach, Forcett.
3. From G. Bennett, Esq., M.D., F.Z.S., Sydney.—A specimen of a Curious Bird (*Didunculus strigirostris*), from the Samoan Islands. A specimen of the Frilled Lizard (*Chlamydosaurus Kingii*). Two specimens of the very beautiful Sponge, known as "Venus' Flower Basket" (*Euplectella aspergillum*), from the China Seas.

[This remarkable object, certainly one of the most beautiful in the whole range of Natural History, was examined with great interest by all present. The secretary mentioned that Dr. Bennett had informed him a full description of the presentation would be forwarded in time for next meeting.]

4. From Master Stanfield, Clarence Plains.—A Black-cheeked Falcon *(Falco melanogenys).*
5. From Mr. J. Bailey, Blue Hills, Oatlands.—The cast skin of a Snake, very perfect.
6. From Captain Reynolds.—The tail of a species of Ray.
7. From Mr. Thomas Genge, Sandy Bay.—Nine Pheasants' Eggs.
8. From Dr. Wm. Walker.—A large specimen of Native Copper from New South Wales.
9. From Miss Wilson.—Specimen of "Copper Moss" from Swansea, Wales. A water-color view of Hobart Town, taken in 1820.
10. Water-color drawings by Mrs. C. Meredith of fossil shells from the North Coast, described in a paper lately read by the Rev. J. E. Tenison Woods.

[The Rev. J. E. T. Woods drew the special attention of the meeting to these drawings illustrative of his former paper. They were beautifully executed, and most accurate in drawing, and he was sure would receive, as they well deserved, the warmest thanks of the Society.]

The Rev. J. E. Tenison Woods, F.G.S., etc., read a very able and interesting paper "On the Fossil Genus *Fenestella.*" The paper was introduced by some preliminary remarks by the writer, and various portions of it were illustrated by observations bearing on the general subject of Fossil Polyzoa.

In connection with the discussion held at last evening meeting on the improvement of the Domain, the following letter from Mr. Abbott, the Superintendent of the Gardens, was read :—

"Royal Society's Gardens,
"8th June, 1875.

"The Council of the Royal Society.

"Gentlemen,—As it is probable the question of improvement of the domain will engage the attention of the Council at its next meeting, I have thought it advisable to forward a few remarks bearing on the subject.

"As to the desirability of the work being undertaken, provided sufficient funds are forthcoming to carry it to a successful issue, there can be but little or no doubt. Having resided in the domain for a period of 24 years, and having during that time repeatedly traversed every part of it, the question of its improvement has frequently been present in my mind, and one time or another I have bestowed a good deal of thought on the matter.

"The removal of dead or dying trees, and surface stones, and the extraction of stumps, from the more prominent parts, are but preliminary operations, that would be necessary in any case, before any real improvement could be undertaken. There seems to be an impression that the sale of the timber would repay the cost of collecting and grubbing, but I consider this to be quite a mistake. The Society has had the privilege for many years of removing the fallen timber, and I have had an opportunity of estimating the actual cost, and labour, of collecting and carting it. This I have always considered to be equal to 12s. per ton, or about one third more than better wood could be bought for in bulk.

"Supposing a large quantity to be cut down at once, the cost of collecting would probably be lessened, and perhaps the sale of the timber might realise sufficient to pay for cutting and collecting, but not more than this ; it would certainly not cover the expense of extracting the stumps.

"Mr. Sayce in his letter read at the last meeting of the Society, speaks of the subsoil as being impervious, but this I cannot admit in the true sense of the word. To a certain extent it may be impenetrable to the roots of plants, but certainly not impervious to moisture. It is in fact just the reverse of this. Being composed of greenstone gravel, one of its great merits would be its efficient drainage, and, although not wishing to advocate planting in holes—for I agree with all Mr. Sayce says on this point—yet I would not hesitate to adopt this plan, to facilitate operations, in most parts of the Domain. This, however, should only be done where plants are ready for planting before the ground has been thoroughly prepared, and the intermediate spaces should be trenched as soon as possible afterwards.

"Too little attention is often bestowed on the proper planting of trees; the prevailing desire appears to be immediate effect, and this is too frequently purchased at the expense of the after welfare of the plants themselves.

"When entering on a work of this kind it should be remembered that it is not the present generation which will reap the full benefit of it—that will remain as a valuable and enduring legacy to future generations.

"There is ample scope for improvement without doubt, and I hold a higher estimate of the capabilities of the soil itself than has been attributed to it. I believe it will be found that there are but few parts of the Domain where a depth of 3 feet could not be obtained by trenching, and even a greater depth on many of the lower parts, were it desirable. A free admixture of the greenstone gravel with the top soil would be beneficial to most plants, especially to coniferæ, which appear to luxuriate in a soil composed of little else than this loosened greenstone.

"If the surface soil was properly attended to this depth would be sufficient to enable most plants to grow to more or less perfection; but certainly not to that degree of perfection which trees attain to in their most favourable natural habitats, as this is rarely arrived at in artificial plantations.

"Attention has been drawn to the stunted appearance of the trees at present in the Domain, and this has been taken as an indication that the soil was not capable of growing trees to perfection, but I do not think the reasons for this stunted appearance have been properly considered. In the first place there can be no doubt that between 20 and 30 years ago, many of the largest gum trees were cut down, some, I believe, for shipbuilding purposes; and, again, during the whole of this time the surface has been depastured by sheep and cattle, which has had the combined effect of consolidating the surface, and preventing any seedling trees from springing up to supply the place of those removed. The wattles again present a most unsightly and stunted appearance, and, being naturally short-lived trees, are evidently rapidly hastening to decay. This is partly due to the cause just mentioned, and partly to the fact that the lower branches have generally been browsed off when the trees were young. Again, the depasturing of cattle has not only consolidated the surface, but it has kept the grass close grazed, which may be considered as removing nature's mulching, the effect of which is that the rains, instead of soaking into the ground, rush precipitately to the water-courses, and thence to the sea, and what little does enter the soil is quickly dried up by the sun and wind. Here we have another cause for the stunted appearance of the remaining trees.

"One of the greatest difficulties that would be met with, when the operations for planting were taken in hand, would be procuring plants of a suitable size. It would be useless to depend on these gardens for a supply; there is in reality no skilled labour available for this work. The most the Society could do would be to supply young plants from time to time of any kind suitable, which would have to be grown in a nursery set apart for the purpose, or by some nurseryman who might undertake the work by contract. It would be essential to grow the plants to some size in the nursery before final planting, as they could be much more easily attended to, and the chance of loss would not be so great; besides which it would be necessary to have a reserve in case of accident.

"But after all the real question just now is not what to do nor how to do it; but where are the funds to come from to employ the necessary amount of labour?—for I am inclined to think the day has gone by when much could be accomplished by prison labour. The fact is the numerical prison strength is daily decreasing, and there is the greatest difficulty in keeping up the strength of the present gangs. Our own garden gang has not for some time been in a satisfactory state. Just at the time when additional strength was urgently required it has been numerically less than ever, and I fear much work pressing for attention will now have to be abandoned for the season. Any gang that might be supplied under present circumstances would make slow progress indeed. Nor am I inclined to think that much could be done permanently by public subscription. Although a few hundred pounds might be collected at first, which might be applied to clear away some of the stumps and stones and open up vistas, yet a much greater outlay would be necessary before planting operation could be undertaken. An expenditure of 30s. and perhaps more, would be required to prepare the ground for every tree planted with a view to ultimate success.

"Although it is desirable that this work should be undertaken with as little delay as possible, especially as the appearance of the Domain will become year by year more uninviting if left to its present fate, yet I think great caution is necessary before entering upon a work of this description until the ways and means have been duly considered. I have always thought the undertaking should be a national one, for unless this is the case it will never be adequately supported. I think it very desirable that sites should be found for numerous test plantations, which would ultimately be of national importance, while they would add to its interest as a place of resort. The garden contains numerous plants that can never attain their full development in their present sites, because there is not sufficient space to do justice to them all; if these are not propagated and planted under circumstances more favourable to their growth, many of them will stand a chance of being destroyed altogether in a few years.

"I am, gentlemen,
"Your obedient servant,
"F. ABBOTT, JUN.,
"Superintendent."

The SECRETARY reported that, with the exception of Mr. Stephens, absent on duty, the Members of the Domain Committee appointed at last meeting had had an interview with the Hon. the Colonial Secretary, and the Hon. the Minister of Lands and Works, and had explained the views of the society as to the proposed improvements, and the material assistance required to carry them out. These views were entertained by the Ministers present with the greatest cordiality, and were very carefully discussed during a prolonged interview. The only difficulty in fact was the want of labour. Mr. Moore mentioned that at present he was most anxious to complete the new cricket ground as soon as possible, having promised to do so. To finish this work, he thought it would be also advisable to make a carriage drive all round the fence, and perhaps open out vistas looking towards Government House, and down the harbour. These works would absorb almost, if not all, the available labour for some time to come ; still, as the object of the deputation was certainly a very important one, he would make every effort to meet their views by getting together as much labour as possible, and placing it at their disposal.

His Excellency, after referring in complimentary terms to Mr. Abbott's letter, observed that he was thoroughly convinced of the necessity of a very carefully considered plan being laid down before any practical action was taken. The Domain was most beautiful in itself and also possessed great capabilities of improvement, but when developing these capabilities great care should be taken at the same time to preserve generally the natural features of the locality. Were he about to undertake such a work himself he would in the first instance spend weeks in walking over and over every portion of the ground so as to become thoroughly acquainted with its every feature. By this means all its latent capabilities would be discovered. The greatest caution should be exercised in the after proceedings, especially in removing old, and planting new trees, etc. If one ugly tree were rashly removed it might only uncover another still more ugly, or if a rock were taken away something worse might appear and require removal in turn, and thus we might go on improving everything off the face of the ground till nothing was left. Without going into very extensive plantations, excellent effects could be obtained by planting the best and most ornamental trees in those localities which were most suitable. The natural formation of the ground would assist them in choosing what and where to plant. For instance, in hollows, where masses of foliage would naturally occur, there they ought to plant. In this manner other natural indications should guide them in forming their plans. For his own part, as he (His Excellency) had always taken a very great interest in matters of this kind he would at all times be most willing to give his personal assistance to any well-considered action which might be taken to improve the Domain. (Applause.)

Mr. Grant was glad to find that the views he had given expression to at a previous meeting, on the economical improvement of the Domain, were likely to find favour. Without going to the expense of trenching on a large scale, a very great deal could be done by carefully selecting proper spots and planting suitable trees here and there, and as the general formation of the ground was favourable for easy drainage, this could be carried on in a gradual and progressive manner at little comparative expense.

The Bishop of Tasmania observed that any one undertaking a work of this kind should possess the practical knowledge of the horticulturist, with the taste of the landscape gardener. Good results could be obtained only by the combination of both. His Lordship gave an instance of a locality well known to himself in England, which, in its unimproved state, was rude and uninviting, and greatly inferior in its capabilities to the Domain, yet, under such skilled management as he had alluded to, was converted, at comparatively small expense, into one of the most attractive public resorts with which he was acquainted. He congratulated the meeting on the fact that the restoration to health of the learned author of the paper they had had the pleasure of listening to had been the means of laying them under a fresh obligation to him. The paper was one of great interest, and this interest was much enhanced by the running commentary with which it was accompanied. Its full value, however, could only be realised by a careful study of it when printed, which he hoped it would soon be, in their "Transactions." He was about to propose that the cordial thanks of the Society were due to the Rev. Julian Woods, but before doing so he would take the opportunity of alluding to the exquisite drawings by Mrs. Meredith, which had been brought under their notice. Every one must be struck by their beauty, but their great merit was, that with so much artistic finish, they possessed all that scientific accuracy without which they would have been comparatively valueless in connection with the paper they were designed to illustrate. The vote then proposed by the Bishop to the Rev. Julian Woods was carried by acclamation.

Mr. M. Allport cordially agreed with all that had been said in praise of Mrs. Meredith's admirable and valuable drawings. It gave him great pleasure to move that the best thanks of the Society were due to Mrs. Meredith for her very valuable contribution.

This having been carried, thanks were also voted to the donors of presentations, with special reference to the very valuable and interesting contributions both of specimens and books from Dr. George Bennett, F.Z.S., of Sydney. The proceedings then terminated.

JULY, 1875.

The monthly evening meeting of the society was held on Tuesday, 13th July. A large number of Fellows were present; His Excellency the Governor in the chair.

J. K. Clark, Esq., who had previously been nominated by the Council, was ballotted for and declared duly elected as a Fellow of the Society.

The SECRETARY (Dr. Agnew) brought under notice the following returns, etc., for the past month :—

1. Visitors to Museum, 1010.
2. Ditto to Gardens, 2006.
3. Plants received at Society's Gardens—From His Excellency, F. A. Weld, Esq., 15 packets seeds of Coniferæ ; 3 ditto (various). From Mr. Geo. Brunning, St. Kilda, Melbourne, 80 plants. From A. Simson, Esq., plants of *Todea barbara* and *Dicksonia dubia*, from the vicinity of George's Bay. From Rev. W. W. Spicer, plants of various Sedums.
4. Plants and Seeds sent from Gardens—To Mr. G. Brunning, St. Kilda, 1 case plants (various). To Royal Gardens, Kew, 1 packet seed of Waratah (*Telopea truncata*). To Mr. Wm. Bull, London, 1 packet ditto.
5. Plants supplied for decoration of public places—To Brickfields Depôt, 60 plants. To Memorial Church, Elizabeth-street, 30 plants. To the Cornelian Bay Cemetery, 198 plants. For Government House grounds, 20 plants.
6. Time of leafing, flowering, etc., of a few standard plants in Society's Gardens during June.
7. Book and periodicals received.
8. Presentations to Museum and library.

Meteorological Tables :—

1. Hobart Town, from F. Abbott, Esq.—Table and summary for June.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Mount Nelson, from the Hobart Town Marine Board.—Ditto.
4. Swan Island, from Ditto.—Tables for April and May.
5. Port Arthur, from J. Coverdale, Esq.—Table for May.
6. From Government Observatory, Melbourne.—Printed tables for January.
7. Wellington, New Zealand, from Dr. Hector.—Tables for February, March, and April. Abstracts of observations from various stations in New Zealand, for January, February, and March.
8. Sydney, from Government Observer.—Printed Tables for January, February, and March.

The presentations to the Museum were as follows :—

1. From His Excellency the Governor.—Twenty-four named specimens of wood from Western Australia, squared and polished. A Japanese mirror, in case. Tusks and ear-bones of Dugong (*Halicore dugong*).
2. From Master J. C. Young.—Two mats from Fiji, originally belonging to King Thakobau. A basket made by a Fijian Chief. The first copy of the earliest newspaper struck off in Fiji. An East Indian hunting knife. Shells (*Littorina sp.*) from Great Barrier Reef.
3. From Mr. Edwin Luckman, Sorell. — An Albino Opossum (*Phalangesta fuliginosa*). Two Brush Wattle Birds (*Anthochæra mellivora*). Three specimens of the White-fronted Epthianura (*Epthianura albifrons*).
4. From R. C. Read, Esq.—Two specimens of *Antichinus albipes*.

5. From Mr. R. Thorne, junr., Forcett. — A Tippet Grebe *(Podiceps Australis)*.
6. From Mr. Weeding, Oatlands.—A Tiger Cat (*Dasyurus maculatus*). Two Native Cats *(Dasyurus viverrinus)*.
7. From Dr. Huston, New Norfolk.—An Opossum mouse *(Dromicia gliriformis)*.
8. From Master W. E. Calder.—A beautiful specimen of a fossil shell (*Spirifera bisulcata*) silicified, showing the spiracles.
9. From Dr. E. S. Hall, *pro* Mr. Hissey.—Minute Shells taken from the stomach of a mullet.
10. From Mr. J. W. Graves.—A fossil shell (*Pacchydomus sacculus*, McCoy), from limestone beds, Bridgewater.
11. From Mr. E. L. Stanfield.—Two Native Cats (*Dasyurus viverrinus*).

The SECRETARY requested special attention to the numerous presentations of books before the meeting from learned bodies with which the Royal Society of Tasmania makes exchanges. These were as follows :—

1. From the British Museum.—Catalogue of Birds, Vol. 1; Hand List of Seals, etc. Guide to Exhibition Rooms, 1874.
2. From the Royal Academy of Sciences, Munich.—Publications of the Academy, 1872-3 and 4.
3. From the Asiatic Society.—Journal of the Society, vol. 7, part I, 1874.
4. From the Royal Geographical Society.—Journal of Society, vol. 43 (1873) bound.
5. From the Zoological Society, London.—Proceedings of Society, part. 3, 1873; parts 1, 2, 3, 1874.
6. From the Royal Astronomical Society.—Memoirs of the Society, vol. 40, 1874-5.
7. From the Geological Society, London.—Quarterly Journal, Nos. 118 and 120. List for 1874.
8. From the Linnean Society.—Journal of Society, vol. 14, Nos. 75, 76, 77 (*Botany*); vol. 12, No. 58 (*Zoology*). List for 1874. Proceedings 1873-4. Additions to Library.
9. From the Government of India.—Memoirs of Geological Survey of India, vol. 10, part 2; vol. 11, part 1. "Palæontologia Indica," vol. 1, part 1; ("Fauna of the fluviatile deposits") series 10, 1. Records of Geological Survey of India, vol. 7, parts 1, 2, 3, 4.
10. From the Government of Victoria.—"Prodromus of Palæontology of Victoria," by Professor McCoy, Decades 1 and 2. Report of Chief Inspector of Mines for 1874. Do. of Mining Surveyors for first quarter of 1875. Mineral Statistics of Victoria for 1874.

The SECRETARY reported that soon after the last evening meeting the Garden Committee, with the Honorable the Colonial Secretary and Minister of Lands and Works, had proceeded to inspect a portion of the Domain. They were there met by His Excellency who kindly accompanied them over the various improvements which had recently been effected in the enclosure round Government House. Afterwards the committee carefully inspected that portion of the Domain which lies beyond the Gardens. Here great numbers of trees, some very unsightly, others in the last stage of decay were noticed, none of which could be either useful or ornamental. After some discussion it was thought best to request the Governor, in conjunction with Mr. Abbott, to mark such trees as it was desirable to remove. The Committee were led to adopt this course on considering the practical interest which His Excellency had shown in the matter, and they were also influenced by the evidence of his skill and taste which their recent visit to the Government House grounds had afforded. His

Excellency when applied to, at once took action at the earliest possible date, and in conjunction with Mr. Abbott had marked a number of trees which would soon be removed by means of labour promised by Government.

His Excellency remarked that agreeably to the request of the Domain Committee he had carefully gone over that portion of the Domain lying between the Gardens and Cornelian Bay, and he had also, to some extent, inspected it generally. In making his observations he had been greatly assisted by Mr. Abbott, to whom he was indebted for many valuable hints. He had marked some trees, which as a beginning, he had no doubt, ought to be removed. Some of these were ugly and deformed in themselves, whilst others obscured the view of finer trees. Many again were so nearly dead already, that if not quickly removed they would soon fall of themselves. He expected that the removal of these trees would open up some pretty vistas looking both up and across the river. Afterwards it could be determined by careful observation if any further clearing was advisable But the removal of trees was not the only matter which should engage their attention. It was of great importance, even at the present early period, that planting operations should be considered and that some definite plan of operations should be adopted. He might, perhaps, be allowed to suggest, that planting might advantageously be commenced somewhat outside of the Domain along the border of the creek near the bridge in Macquarie-street. This, however, was rather a matter for the consideration of the Town Council. In a sanitary point of view the blue gum might be of great benefit to this locality. Then the railway works might be enclosed by ornamental trees. Some appropriate and pretty trees such as *Pinus maritima*, etc., might be planted behind the Battery and would look well from the harbour. The sides of the railway also at certain points would furnish good sites for planting. Coming round by Government House we find the large and unsightly quarry. This might be made very ornamental at a very trifling expense by judicious planting, etc. Beyond this, the ravine above the pond might easily be converted as suggested by Mr. Abbott, into a pretty fern tree valley. Round the domain and at its upper entrance he had found a stone-crusher at work, and the engine was fed with firewood from trees in the vicinity. In cutting down trees for this purpose great care should be taken that those only should be removed which could be advantageously spared from the locality.

Mr. Grant had no doubt that the planting on the borders of the creek as suggested by His Excellency would be both beneficial and ornamental. The planting of the railway enclosure which had also been alluded to by the President would be undertaken by the Railway Company. (Applause.) At many other points along the railway cuttings in the domain there was plenty of soil for the growth of trees of considerable size.

Mr. Stephens directed the attention of the meeting to specimens of the *strata* traversed by the prospecting shaft at Spring Bay, which had been forwarded by Mr. Robinson of Triabunna. For the first 23 feet the sinking appeared to have been through surface soil and a yellowish sandstone, succeeded by a grey sandstone charged with thin streaks and irregular bands of carbonaceous matter, and occasional nodular patches of an indurated fire-clay ; the whole extending to a depth of about 70 feet. Though the evidence up to the present time was of a somewhat negative character, it was quite as favourable as could be expected, where nothing is accurately known of the order or thickness of the various members of the carboniferous series. Had section boxes, or any kind of specimens, been preserved to show the results obtained in the other shafts by which these coal measures have already been proved to a depth of at least 400 feet, it might now have been possible either to assure the promoters of speedy success, or to point out a more eligible locality. He (Mr. Stephens) hoped that they would persevere in their spirited undertaking, and that all persons engaged in such works would remember the importance of preserving an exact record of the results of sinking or boring in any part of the colony, with specimens of the different rocks which are met with.

The SECRETARY read a paper, contributed by Dr. G. Bennett, F. L. S., F.Z.S. of Sydney, a corresponding member of the society, "On the Frilled Lizard (*Chlamydosaurus Kingii*), of Queensland." A paper by the same learned author on the beautiful Sponge from the Philippine Islands, known as "Venus' Flower Basket" (*Euplectella aspergillum*), was also read by the Secretary.

This paper was listened to with marked attention, and specimens of the silicious skeletons of the *Euplectella*—than which there is, perhaps, nothing more exquisite in the whole domain of natural history—were examined with the greatest interest by all present. For these fine specimens the society, as noticed at the last meeting, is indebted to the liberality of Dr. Bennett.

M. ALLPORT, Esq., F.L.S., F.Z.S., etc., etc., read a paper entitled "Some Further Notes on the Salmon Experiment."

Mr. RULE observed, although he could not speak scientifically as to the distinctions between the grilse and salmon trout, he could do so from a practical point of view. He had been told by experienced fishermen —and from his own long experience, he knew it to be a fact—that the grilse and trout could be readily distinguised by simply grasping them a little above the tail, and then lifting them up. The trout could only with difficulty be held in this position, owing to the thickness of the flesh at the point grasped ; whereas, the thinner structure of the salmon affords a firm hold. After applying this test with others) to our fish, he had no doubt whatever it was a true salmon.

Mr. STEPHENS proposed that the "thanks of the meeting should be given to Dr. Bennett for his very interesting papers, and, also to Mr. Allport for his able and vigorous championship of the Tasmanian salmon." Carried by acclamation.

Mr. BARNARD then moved "that a vote of thanks be accorded to the donors of the various presentations to the Museum and Library."

Mr. STEPHENS, in seconding the motion, called attention to the large collection of West Australian woods, presented by his Excellency, whom he was sure they were all glad to see presiding at the meetings of the society. (Hear, hear.)

The vote having passed, the President left the chair.

AUGUST, 1875.

The monthly evening meeting was held on Monday, the 9th August. His Excellency F. A. Weld, Esq., President, in the chair.

The Secretary brought under notice the usual monthly returns, viz.:—

1. Visitors to Museum during July, total 1375.
2. Ditto to Gardens ditto. total 2772.
3. Plants and seeds received at Gardens—From Botanic Gardens, Christchurch, New Zealand, 46 plants. From Mr. J. Latham, 9 packets seeds, 45 varieties, Anemone and Ranunculus.
4. Plants and seeds sent from Gardens—To Messrs. Vilmorin, Andrioux and Co., France, one ditto. To Messrs Fardey and Co., France, one ditto To Jules Cock and Sœurs, France, one ditto. To Mons. Huber, Hyeres, France, one ditto. To Shepherd and Co., Sydney, a small box of seeds. To the North China Branch Royal Asiatic Society, Shanghai, one package of seeds. To the Botanic Gardens, Queensland, one small box of plants and seeds.
5. Times of leafing, etc., of a few standard plants in Society's Gardens during July.
6. Books and periodicals received.
7. Presentations to Museum and Library.

Meteorological Returns.

1. Hobart Town—From F. Abbott, Esq., table for July.
2. New Norfolk—From W. E. Shoobridge, Esq., ditto.
3. Port Arthur—From J. Coverdale, Esq., ditto for June.
4. Kent's Group—From the Marine Board, tables for May, June, July.
5. Mount Nelson, from ditto.—Table for July.
6. Sydney, from the Government Observer.—Printed tables for April.

The presentations to the Museum and Library were as follows:—

1. From Mr. Quinlan, Montpelier-street.—A Pouched Lamprey *(Geotria Allporti* Gthr.*)*
2. From Mr. Bealey.—A Pelican *(Telecanus conspicillatus.)*
3. From J. R. Scott, Esq., M.H.A —Specimens of the stone implements of the Tasmanian Aborigines. An explanatory letter from Mr. Scott accompanying the presentatation was read. The following is an extract:—

"It has long been desirable to fix upon a spot where the aborigines obtained their flint or stone implements. I am now able to fix upon two places, viz.—First, about ten chains immediately in front and to the north-east of the stone hut in Stocker's Bottom, County of Somerset, parish of Peel.

"The second is about one mile more to the south-west, on Lot 443, on a branch of Dismal Creek, running out of Stocker's Bottom.

"These two places are about six miles distant from the Macquarie River, where I found the stones forwarded some years since, known as the 'Mount Morriston' collection, and now in the Museum."

On the presentation of the Stone Implements, the Rev. Julian Woods called attention to the extraordinary similarity of one of them to a spear-head figured in the *Geological Society's Journal* some years previously. He observed that probably the arguments based on the antiquity of such relics might require modification, seeing that in this island the "stone age" and "flint implements" belong to the present century.

4. From F. Groom, Esq, Harefield, St. Mary's. An unusually fine specimen of the "Sharp-nosed Eel," measuring 2 feet 5 inches in length. [It is believed that this fish has not yet been scientifically named and described. A specimen, however, was last year forwarded by Mr. M. Allport to Dr. Günther, of the British Museum, from whom information relative to it will doubtless be received in due course.]

5. From Mr. Hissey. Four specimens of the young of the Bandicoot (*Perameles obesula*) from the pouch.
6. From His Excellency the Governor—Rock Specimens from the variegated ferruginous sandstones of Western Australia, and probably belonging to the lowest secondary formations. Egg of "Native Pheasant" *(Leipoa ocellata)*, and other eggs.
7. From W. Lovett, Esq.—A specimen of the "Sooty Oyster-catcher," or "Black Red Bill" *(Hæmatopus fuliginosus)*, shot at Kangaroo Bluff.
8. From J. W. Graves, Esq.—A Ring-tailed Opossum, *(Phalangista viverrina.)*
9. From the Ven. Archdeacon Davies—A fossil from a hill on Mr. Pitt's property, Hunting Grounds.

[In reference to this presentation, the Rev. J. E. T. Woods remarked that it was a very fine and unusually large specimen of the coral known as *Stenopora informis*, Lonsdale, with a shell of *Myacites curvata*, Lonsdale, adhering. The both belong to the Marine Devonian period, of which so many examples occur in Tasmania.]

Presentation to Library.

1. From Sir Robert Officer—Benthams "Flora Australiensis," six vols. bound.

[The Secretary requested special attention to this valuable presentation. Being the standard work on Australian botany, it was much wanted, but the council had never been able, from want of funds, to procure it. Other works, indeed, were still required, and as several of the Fellows had already shown their practical interest in the welfare of the society by making presentations, he hoped that others, whether resident in town or country, would be induced to follow their example. Good books could not be better placed than in a library, where they could be utilised by all comers. A list of such as are required could at all times be had from the curator.]

2. From Mr. T. Roblin—Tables of Affinities of the Classes of the Animal Kingdom, by Prof. J. Reay Greene; three sheets mounted on rollers.
3. From Baron F. von Mueller—Proceedings of the Zoological and Acclimatisation Society of Victoria, vol. 4, 1875.
4. From the Royal Society of New South Wales—Transactions, 1874.
5. From the Government of New Zealand—Census for 1874.
6. From the Malacological Society of Belgium—Proceedings for 1874.
7. From the Entomological Society of Belgium.—Proceedings for 1874.

The Rev. J. E. Tenison Woods, F.G.S., F.L.S., read a paper on the Freshwater shells of Tasmania, prefacing it by some remarks on the study of fresh water shells generally. "It must not be supposed," he said, "that such studies meant no more than merely naming certain specimens new to science. To the outside public it might seem no more, but to the man of science it was different. A name when applied to a new species thenceforth became not only a tally by which it might be known and referred to, but it meant all the details of observation in its description, and it was a centre around which a multitude of useful observations would be grouped. Thus *Scalaria Australis* is a name applied to a marine shell of a peculiar, and at one time, rare genus. Other naturalists had found that its habits were most interesting and various. Thenceforth the name was the repository in which those observations were collected, and they were conveyed to the mind of those familiar with them by the mere association of the name. Finally the same mollusc had been found to contain a beautiful purple dye, and this also became, if we may so speak, a property of the name. All natural science is more or less open to the reproach that it is a science of names, but this would also be strictly true of all human knowledge, since it is only by names or words that it can be communicated. The fresh water shells did not present a very inviting field to the naturalist in the early history of science, but they were not long studied before they were found to possess features worthy of attention. A great impetus had been given to the study by Mons. Draparnaud, a young French surgeon, whose brilliant career was stopped all too soon by the insiduous ravages of consumption. His work forms a standard on the subject, as it is a model of accurate observation, careful delineation, and charming interest. It was owing to the knowledge thus given that the eminent osteologist Baron Cuvier was so much aided in his determination of the fossils of Montmartre, Paris. There bones were found associated with shells, and the bones might have been supposed to belong to marine drift, but an attentive consideration of the shells showed them to be fresh water, and of a kind whose habits of life were now known. This tended materially also to explain the conditions under which the extinct mammals of the bed existed. Much light had been thrown on the conditions of life in the coal formation from the freshwater and land shells found embedded in it. The reverend gentleman went on to describe generally the natural history of that order of Mollusca known as *Pulmo branchiata*, that is Molluscs with lungs and gills, breathing both air and water. Water is their natural element, but they can also live out of it. As they live in creeks and waterholes, which are liable to diminish or totally dry up in certain seasons, they must have means for withstanding a drought, or the order would soon perish. They are therefore provided with an apparatus which is part lung and part gill. The organ is a respiratory sac through which the blood flows, and is aerated in a network of minute vessels, and it is filled with branchial plates or lamellæ for the purpose of extracting the necessary oxygen from water. He called attention to the observation of Draparnaud, who said that if we consider the very small number of points by which the animal is attached to the shell, one is astonished to understand how so fragile a covering could withstand the action of external agents, and at the same time preserve its solidity, its colour, and its transparency, especially as upon the death of the animal it bleaches and exfoliates on slight exposure. We must then admit some sort of intercommunication between the shell and the animal which it encloses. We must admit also that it is animated with vitality, although it appears to our eyes, which are too feeble to unravel its interior structure, as if it were mere inert matter." The reverend gentleman then read the introduction to his paper.

The Governor observed that the remarks made by the Rev. Julian Woods, as to the stone implements, showed the care that should be taken not to allow preconceived theories to hurry our conclusions in matters of fact. He thought that it was very easy for even very able, honest, and painstaking men to miss facts that lay just to the right or left, or close behind them, whilst they were looking straight at their theory. The lapse of a very few years often was sufficient to cover up and bury facts or traditions that might be of great value. An instance of this had occurred in New Zealand. A very eminent scientific man there had argued, in a most interesting paper, that the race who made and used the stone knives and implements found in the kitchen mounds on the Rakaia together with moa bones were probably a race distinct from, and anterior to, the Maori, and of immense antiquity; that the moa (*Dinornis*) itself had been for ages an extinct bird; that there was no reliable evidence from Maori sources of the recent existence of the moa (*Dinornis*), still less any trace at all of any tradition of the newly-discovered *Harpagon Moorei*, the gigantic eagle, or bird of prey, whose bones had very recently been discovered at Glenmark. These general views had been combated by Dr. Hector, and also contradicted by Sir G. Grey and others whose testimony was of greater weight upon native evidence that even Sir George's.

For himself, he (the President) might say that having been one of the early settlers of New Zealand, he had opportunities of knowing the traditions of the New Zealanders, which were not available to scientific men who came to New Zealand at a later period, and who, generally inhabitants of towns, were less thrown amongst the natives. Now in the first place he could remark that the "stone age" of the New Zealander had not passed when the early settlers arrived; they were still making stone implements, and though in the northern island the tradition regarding the moa had assumed in some cases a wild and legendary form (of which he gave examples) yet when he first visited the Southern island the natives warned him when he explored the Kaikora inland country to be careful in attacking the moa, a huge bird that he would certainly meet, for if he approached it from behind it would "kick like a horse" and possibly break his leg, thus showing their acquaintance with the habits of a bird closely allied to the ostrich and emu family. In the Wairau also the natives had a quill said to be of the moa, and in the Wellington museum, a portion of the skin of the neck of one of these birds with feathers adhering is at present preserved, he himself had exhumed the skeleton of a moa lying on the clayey side of a hill, and only partially covered by a slight slip of a few inches of vegetable mould from a hillock above. The gristly rings of the windpipe of this bird were in a perfect state of perservation. It is yet more remarkable that when early in January. 1851 he travelled on foot from Port Cooper, the present site of the Canterbury settlement to Warau, being the first European who had traversed that district, at Kaikora, under the mountains named by Cook, the "Lookers on," an old chief "Kaikora" "of that Ilk," told him that on the tops of those mountains an enormous bird of prey rufous in colour, built its nest, and that in their forefather's time it sometimes descended suddenly and was large enough to carry off a good sized boy or girl. Was not this a tradition of the Harpagon Moorei? This bird had not been seen for some generations, but though it was doubtful whether their fathers had seen the moa their grandfathers I have been assured certainly had, and natives doubted not but that it still existed in wild localities.

Mr. M. Allport had listened with the greatest pleasure not only to the admirable paper just read, but also to the highly interesting introductory remarks by its learned author, to whom he proposed a special vote of thanks should be accorded. (Applause.)

The Bishop of Tasmania, in rising to second the vote of thanks to the reader of the paper, wished to make a few observations upon the argument previously advanced upon the stone or so called flint implement before them. That implement was, as he was assured, the work of an Australian savage, and if so, a presumption was raised that the inferences drawn by Sir C. Lyell, and others, upon the antiquity of man have been rash. It is quite possible that hasty conclusions have been drawn, and that calculations will have to be corrected by some thousands or perhaps hundreds of thousand of years. But the main argument is not disturbed by that flint implement before them. Put by the side of another such weapon upon which Sir C. Lyall and others have reasoned, it plainly tells us that those savages who lived some untold periods ago, and those who till lately inhabited this island, are of the same human race, and with common instincts have fallen back in the same stage of civilisation, upon the same rude weapons suggested to them by the same flint material lying before their eyes. The flint was altogether in a scientific point of view different from another found associated with organic remains of animals that existed in an exceedingly remote period of time. Besides, there are other parallel lines of evidence, resting upon ethnological science, and the science of language, which supported the inference drawn by Sir C. Lyell. The flint implement before them, and the facts related by His

Excellency have an exceedingly interesting value of their own, but he could not accept them in the sense which had been sought to be put upon them. As to the paper which had been read subsequently, he had pleasure in seconding the vote of thanks for the gratification Father Woods had afforded him personally, the obligation he had again placed upon the Society, and the benefit conferred upon science. The prefatory remarks had also a valuable educational character, and he should rejoice if these remarks had the effect of introducing more largely the study of natural science in the curriculum of popular education. It was not the acquisition of shells that made the naturalist, or a cabinet of fossils the geologist; but the study of natural objects as a branch of Education developed first the observing faculties, then the classifying and then the inductive and reasoning faculties. The paper was an exceedingly interesting one, and he had much pleasure in adding his testimony to its value.

The vote having been put by the chair, was carried by acclamation.

Mr. RULE observed that the immense age of the flint implements of Europe was shown by the conditions in which they existed in the caves where they were found. They were covered by stalagmitic deposits of many feet in thickness, and other matters, and mixed up with the bones of extinct animals of pre-historic times. It was these surroundings which gave a guarantee as to the enormous antiquity of the implements.

HIS EXCELLENCY said that he had not understood that the Rev. Julian Woods meant to adduce the facts he had alluded to as proofs of a theory, but as instances of how a pre-conceived theory might unconsciously influence conclusions—for himself, in the few unpremeditated remarks he had made, his object had been simply to illustrate the desirability that collectors of facts should be very careful, in their statement of facts, not to allow their judgment to be influenced by pre-conceived opinions, or to jump too readily at conclusions from a partial view. He remembered talking in England to a late well-known naturalist, a gentleman respected not only for his personal efforts in the cause of science, and for his attainments and knowledge, but also for the honest zeal which he threw into whatever interested him—part of his creed was that cannibalism was only the result of want of animal food and hunger—never deliberate and systematic. Being appealed to as a resident of New Zealand he (the President) was obliged with much humility to express a contrary opinion, and to instance cases in which slave girls had been slain for feasts or the bodies of enemies killed in battle had been eaten, it being, moreover, supposed that the heart of a chief imparted his courage to the child who feasted on it—having eaten a former possessor was, moreover, a valid title to land—and it also appeared to him, for several reasons, that the "Kai Tapu," sacred food, was in some degree connected with an obsolete idea of sacrifice. These reasons, however, had no effect whatsoever, upon the gentleman to whom they were addressed. It was, vulgarly speaking, a case of so much the worse for the facts. He (the President) could only excuse this digression on the ground that he wished to point out the advantages of bringing calm criticism and a dispassionate mind to bear upon the registration and discussion of facts, and of viewing both sides of every question.

Mr JUSTIN BROWNE, in proposing a vote of thanks to the donors of presentations, referred especially to the donation of books from Sir Robert Officer. He hoped the remarks made by the Secretary might induce some of our town or country members, or others, to consider if they could not do something towards our library. Some might contribute in money, which would be the preferable mode, but other might have recent works which they could spare, or recent editions of old works which we already possess.

The vote having been agreed to, the meeting terminated.

ON THE GENUS FENESTELLA.

By the Rev. J. E. Tenison Woods, F.G.S., &c.

[*Read 8th June*, 1875.]

As species of Fenestella are very common as fossils in the Devonian rocks, but especially those of Tasmania, a few observations on the genus and its affinities will be found useful to geologists.

Fenestella is a genus placed now by all palæontologists in the Class Polyzoa, Order I. *Infundibulata.*

Sub order *Cheilostomata*, that is to say, with the aperture of the cell filled with a thin membranaceous or calcarious velum, with a crescentic mouth provided with a movable lip. This latter feature in the case of Fenestella is concluded from analogy and certain anatomical details, because the fossils themselves are never so perfectly preserved as to manifest them.

Fenestella is also placed in the subdivision *B. inarticulata* or continuous, and in the section *bimultiserialaria*, that is, the cells disposed in a double or multiple series. It is also placed by most authors in the family *Escharidæ*, of which the definition is as follows :—Polyzoarium erect, rigid, foliaceous, and expanded, lobate, or reticulated. Cell disposed quincuncially in the same plane on one or both sides of the polyzoarium. But in some cases this hardly applies, as the cells are sometimes, as in the case of *F. internata*, Lonsd. in a double series only. The genus was also placed with the Retepora, of which the definition is foliaceous, calcareous, reticulated, cells immersed opening on one surface only. But in 1830 Mr. Miller suggested a new genus for certain reticulated polyzoa in the carboniferous limestone which Mr. Lonsdale adopted. All cup-shaped reticulated polyzoa were hitherto called Retepora, but now it was agreed to name Retepora those only on which the openings of the cells were inside the cup, and those in which the cells opened on the outside only were henceforth erected into a new genus, and called Fenestella. But difficulties in applying his distinction soon arose. The cup-shaped or conical figure is nearly always absent. In Tasmania the distinction would be of no avail. The polyzoary, though very wavy and irregular, is always fragmentary, and often lies perfectly flat. Prof. Phillips suggests (Pal. Foss. of Cornwall, Devon, &c., p. 22) another mark of distinction. He says that the non-poriferous surface of Fenestella is usually marked by longitudinal, more or less continuous ribs, united by bars of smaller diameter, leaving oval or subquadrangular spaces. In Retepora these spaces look more like holes or perforations through the coral. The external poriferous interstices of Fenestella are in several species, but perhaps not in all, carinated in the middle.

It seems to me that there is a better mark of distinction than this, at least for the Tasmanian species. In Retepora the holes are at rarer intervals, and the term bars cannot be applied to the tissue above or below them. It is a mass of cells like the rest of the polyzoary. In Fenestella the bars are sparsely celluliferous. There are calcareous points of attachment to give mutual strength and support to dichotomously dividing and spreading ligulate series of cells. The transverse bars are much narrower than the celluliferous portion, and they are given off almost at right angles, and in some species only very slightly arched. It is this peculiarity which causes the interstices to be more quadrangular than oval.

Prof. Phillips thus defines the genus (*loc. cit.*) :—" General figure spreading from a narrow base to an infundibuliform or foliaceous figure; substance, a thin stony expansion, composed of slender radiating or longitudinal ribs variously connected by transverse bars, so as to constitute a more or less regular open network. He adds (but the italic words marked by me do not apply to all the Tasmanian species) the longitudinal ribs margined on each side by *one row of pores* on the outer face only."

It must be always borne in mind that we very seldom find anything but *casts* of these beautiful fossils. The calcareous matters have been so completely dissolved away that nothing remains of the old polyzoary. The casts too seldom show any markings of the front or back of the cells. The most of the specimens preserved by collectors are valueless as showing any details. They are merely impressions of the interstices or net-work markings, and nothing more. Those who are very familiar with the species might determine them from this alone, but it is hardly a safe identification. There are, however, in the Museum of this Society some specimens from Maria Island, where the whole polyzoary has been beautifully preserved. The calcareous matter is untouched, and the detail of the cells is plainly evident. In one species, *Fenestella ampla*, there is a raised margin round the mouth and circular depressions, probably for avicularia. In one place also there is the embossed dome of what appears to be an ovicell. Thus the functions of nutrition and reproduction were in no way different from the polyzoa of the present day. It is seldom that such an opportunity is offered for studying the details of these interesting organisms. Prof. Phillips (*loc. cit.*) says "that owing to the decomposition of the whole or part of the coralline substance in argillaceous rocks these beautiful fossils must be studied in such cases by very careful comparison of the impressions of the surfaces. In limestone beds the substance is often well exposed by atmospheric influences, but in such instances the poriferous face seldom clearly appears, owing apparently to the former adhesion of this face to the rock." This passage is especially applicable to the fossils of Tasmania. In most cases we have only impressions on argillaceous rocks, while the well preserved specimen now referred to is a limestone rock. Here but for the dark compact surrounding matrix and the accompanying mass of *Stenopora ovata* Lonsd. the white crystalline network of Polyzoan fragments might almost seem to be from the Polyzoan limestone of the middle Cainozoic of Australia. But except in few instance the fossils are most provokingly nearly all face downwards.

There are 28 known species of Fenestella in British rocks according to Morris' Catalogue, in which are none of the Australian species. They range from the L. Silurian to the Permian formation, but their principal horizon seems to be the Devonian. Three species and a variety are known in Tasmania, the species all represented in Australia and the variety also probably. They are thus described:—

Fenestella ampla Lonsdale.* Cupshaped, celluliferous, surface internal, branches dichotomous, broad, flat, thin; meshes oval; rows of cells numerous, rarely limited to two, alternate; transverse connecting processes sometimes cellular; inner layer of non-cellular surface very fibrous; external layer very granular, non-fibrous, gemmuliferous vessel small.

"Among the specimens of this coral," continues Mr. Lonsdale, "contained in the collection under consideration was one which afforded some interesting changes dependent upon age, the absence of which in the series originally examined was alluded to in the species. In the uppermost portion of this specimen the casts of the cellular surface exhibited similar characters to those displayed in Mr. Darwin's series, with the addition occasionally of a crescent-shaped impression under the mouth, and due, it is believed, to a local modification of the sculpturing on the surface of the other cells. A little lower the ridges, or furrows representing, them began to disappear, and still lower by a further thickening of the exterior all traces of them were obliterated, the interspaces between the mouths displaying irregular protuberances; and that which was considered as a state bordering upon decrepitude exhibited casts of minute oral apertures, with longer projections immediately beneath marking the original exten-

* These and the two following descriptions are taken from Darwin's Geological Observations in South America, etc., page 163. Appendix. Quoted also in Strzelecki's New South Wales and Van Diemen's Land, page 268.

sion of the mouths." Query, Were these protuberances ovicells.

Fenestella internata, Lonsdale. Cup-shaped; celluliferous surface internal; branches dichotomous compressed, breadth variable; meshes oblong, narrow; rows of cells, 2—5, divided by longitudinal ridges; transverse connecting processes short, without cells; non-cellular surface, inner layer sharply fibrous, outer layer minutely granular.

Fenestella fossula. Lonsdale. Cup-shaped; celluliferous surface internal; branches dichotomous, slender; meshes oval; rows of cells two; transverse processes non-cellular; inner layer of non-celluliferous surface minutely fibrous, external layer smooth or granular.

Variety *a F. densa*. Etheridge.* Of this variety, if it be not a distinct species, Mr. E. says:—"Form of polyzoarium not known, probably cup-shaped, one portion is foliaceous, meshes or fenestrules oval, small, densely arranged upon the expanded cœnœcium or polypidom, transverse processes or bars non-cellular. These unsatisfactory casts of Fenestella I refer to Lonsdales species *F. fossula*. No good characters are left for determination. The transverse processes or bars and the fenestrules are so obscure that any attempt to give definite characters would mislead. It so closely resembles *F. fossula* from Mount Wellington, Tasmania, and St. Patrick's Plains, New South Wales, that I feel obliged to refer it to that form. Any additional species would only multiply names. I had, however, proposed the name of *F. densa* for this Queensland specimen. The original habit was probably infundibuliform or cup-shaped; but whether the bars were rectangularly dichotomous with oval meshes, cannot be distinctly made out. Locality, Gympie, Queensland, Smithfield reef. Form, Devonian.

It will be seen that the above characters differ from what I have said on the cup-shape which many specimens in the Museum will show to be untenable, and in the transverse bars bearing cells. But as the observations were all apparently made from casts mistakes might easily arise.

We may now enquire, what are the affinities of the genus Fenestella, or its relations with other genera. It cannot strictly speaking, be classed with Retepora for the reasons I have given. As a slender ligulate polyzoarium strengthened and held together by transverse bars its disassociation from Retepora is very evident; and this is plainly seen in the British Devonian species, *F. laxa*, Lons., where the bars are irregular at rare intervals, and giving rise to interstices of three or four lines square. Among existing polyzoa we have

* Proceedings of Geological Society, April 24th, 1872, p. 332.

such a form in *Canda arachnoides* (Lamouroux Encyclop. Methodique 5, p. 64, figs. 18 to 22), where the branches are connected with tubular fibres, but these are flexible, horny, and not calcareous. There is, however, a species of Hornera, *H. Gambierensis*, Busk, in the polyzoan limestone of Mount Gambier, a middle cainozoic tertiary fossil, where the ligulate celluliferous portions are united by transverse calcareous bars. The analogy of this fossil to Fenestella is very great. In Hornera, however, the back of the cells shows concentric ridges of growth, whereas that of Fenestella is fibrous. The casts of the two forms are the same, and widely as they are separated in point of time, I am much inclined to the opinion that *Hornera Gambierensis* is one of the recent analogues of the Devonian Fenestellæ.

Were these fossils entirely calcareous? In answer to this it must be remembered that a corneous substance, the nature of which has not received the attention it deserves, forms the root byssus or point of attachment of many polyzoa. It also forms the point of attachment between each cell in Catenicella, and the junction of the internodes, in Calpidium, Salicornaria, &c. I have reason to believe that it lines the cells in all polyzoa. Something like that is seen in Catenicella under the microscope. In examining many hundred specimens I remarked that similar species showed the same optical peculiarities under the polariscope. In Catenicellæ these were generally slight; in Bugula on the other hand most brilliant. Sometimes when the whole calcareous portions of Fenestella are removed, there remains a series of rounded cells, which are not effected by acids. These may be the corneous lining of the cells. It would seem from the fact that a calcareous root is never seen in Fenestella, that it had a fibrous byssus like Canda, &c. How these bars and extra cellular portions are formed is not known, even in existing species. The body contained in the cell must not, however, be considered as an individual. Indeed, in living species when thousands of the cells are open one of them is touched, the whole draw back, and close instantly. We must consider the polyzoarium like a plant with leaves, bark, buds, flowers, seeds, and the different processes belonging to each. These constitute one whole which they subserve by different functions endlessly repeated in one individual.

Finally the fewness of species of one genus, though individuals are as common as in any deposit is a remarkable fact. In recent rocks genera of polyzoa can be counted by tens, and species by hundreds. It must, however, be remembered that the past forms are as highly organised as those of the present day, and belonging to specially developed classes.

FURTHER NOTES ON THE SALMON EXPERIMENT.

By Morton Allport, F.L.S., F.Z.S., &c.

[*Read* 13*th July*, 1875.]

The Fellows of the Society may remember that since the capture of the female grilse at Bridgewater in December, 1873, and which fish I shall in this paper refer to as "the first grilse," a male specimen of nearly the same size and weight, and which I shall refer to as "the second grilse," was caught in the lower Derwent. The second grilse was, in January last, forwarded to Dr. Günther, of the British Museum, for examination, and in reference to it I received by last mail from Dr. Günther the following remarks:—

"The most important specimen is that described in your letter as a migratory salmon, weighing three pounds, taken in the salt water of the Derwent estuary.

"This fish has a short, broad tail, with a perfectly truncated caudal fin, fourteen scales in a transverse line between the adipose fin and lateral line; numerous x shaped spots on the body; 54 pyloric appendages, characters which leave no doubt whatever in my mind that it is a *salmo trutta*, as which it has been recognised by other men well versed in the distinctions of salmonoids.

"It had in its stomach eight anchovies, a diet which will account for the rapid growth of salmonoids in your waters, but which will not improve the flavour of their flesh.

"I have placed this specimen into our public galleries, as evidence of the remarkable success which has attended the efforts of the colony to introduce salmonoids."

Before referring to the above remarks in detail, I desire to express my sense of the obligation we are under to Dr. Günther for the prompt courtesy with which he has at all times examined and reported upon the salmonoids sent from the colony, and my conviction is that any light thrown upon the obscure life history of migratory salmon by the experiment in this colony will always be hailed by him as a scientific gain, even though such light may change somewhat his own preconceived opinions.

In determining the species of any indivividual belonging to the genus *salmo* in this colony, as we have not the advantage of undoubted fresh specimens for comparison, we have to rely on the written descriptions of recognised authorities on the subject, aided by what we may gather of the life history of the particular individual, so that when dealing with the first grilse, its determination rested on a careful detailed comparison with the descriptions contained in Dr. Günther's admirable "Catalogue of Fishes in the British Museum," published in 1866, coupled with the knowledge that out of nearly 10,000 fish turned into the Derwent, barely 300 were salmon trout, and the remainder salmon; and that the 300 salmon trout had been liberated in 1867, while 3,000 of the salmon had been liberated in 1865, and the remainder with the salmon trout in 1867. I now propose to deal *seriatim* with Dr. Günther's reasons for concluding that the second grilse is a salmon trout, and first the "short broad tail, with a perfectly truncated caudal fin." Though Dr. Günther, in the catalogue, gives, as one test, "the form of the caudal fin in specimens of a given size, age, and sexual condition," there is no statement which implies that this is an infallible test in immature fish, and as an actual matter of fact, the caudal fin of the first grilse is decidedly emarginate or forked, which was one argument used by me for deciding that it was a true salmon, because salmon trout of even less size almost invariably have this fin truncated, or even rounded. (See Proceedings Royal Society, Tasmania, 1874, p 15). Again, it is remarkable that every salmonoid (except the second grilse) caught in the Derwent estuary last year, and of which four had reached the size at which the caudal fins of salmon trout usually become truncated had the caudal fin more or less distinctly forked. Two of those fish are now before you, and speak for themselves, especially when compared with the male smolt sent to the salmon commissioners from England, and in which the caudal fin is but slightly more forked than in its larger companions. In spite of this discrepancy I wish it to be distinctly understood that I regard the second grilse as identical in species with all these salmonoids, and am disposed to place little reliance on this test where the fish are approaching the adult stage.

An enormous diversity will be found in the form of the caudal fin in specimens of *salmo fario* or common trout, many of which have it truncate when the fish are but 5 or 6 inches in length, while others show emargination when 17 or 18 inches long.

There appears to be, as hinted by Dr. Günther, some subtle connection between the state of sexual development and the form of the caudal fin, and as we know that a percentage of the male salmon parr at only 6 inches in length do arrive at actual sexual maturity, and are capable of impregnating the ova of the full grown female salmon, is it not quite possible that these rapidly developed male fish may exhibit the truncate fin at an earlier stage than their sexually immature brethren?

The second reason assigned is "14 scales in a transverse line between the adipose fin and lateral line." Here again a marvellous discrepancy exists amongst the salmonoids taken in the estuary of the Derwent, for out of some 30 specimens examined the numbers have ranged from 11 to 14, but in no instance in fish taken below Bridgewater has the number exceeded 14.

In the detailed descriptions of various specimens of *salmo salar* in the British Museum the number of these scales is unfortunately omitted, but in four instances the number in the transverse series descending obliquely backwards from the origin of the dorsal fin to the lateral line is given as well as the number of the longitudinal series of scales between the lateral line and the base of the ventral. In one adult the numbers are $\frac{25}{20}$; in another adult $\frac{26}{22}$; in the third in the grilse stage $\frac{25}{19}$; and in the fourth a parr $\frac{22}{20}$.

Next let us turn to Dr. Günther's descriptions of the salmon trout in the Museum, and we find that the number of scales between the adipose fin and the lateral line varies even in the adult fish from 13 to 15, the latter number never having yet been found in any of our salmonoids taken in salt water.

The male smolt from England already mentioned contains only one scale less in this series (viz., 13) than the second grilse, while the salmon parr preserved in our Museum, which was hatched from an English ovum, has 14 on one side and 13 on the other.

Now, finding this discrepancy coupled with the great variation in the numbers exhibited by our own salmonoids, are we not justified in concluding that, however constant within certain limits, this test may be in mature fish, that as applied to immature specimens, it is all but valueless?

Dr. Günther's next reason—" numerous x shaped spots on the body "—requires very few words. When fresh from the water the second grilse was perfectly free from spots below the lateral line, and had but few above that line; shortly after the immersion in spirit, however, several more spots became apparent, and the same thing took place with the first grilse. On turning to Dr. Günther's descriptions, I find details of only one specimen of true salmon, which approximates in size to the second grilse. This is a male, 22 inches long, in reference to which Dr. Günther writes :—" Upper parts greenish, which colour gradually passes into the silvery hue of the belly. There are some scattered x shaped black spots on the side of the back above the lateral line."

It is curious that the above description occurs only in the solitary instance in which the size and sex agrees with the second grilse, because no test is so variable as the fleeting one of colour, which in the *salmonidæ* (as in most fish) is perpetually liable to change rapidly from causes as yet unexplained.

As to the last reason, "54 pyloric appendages," as I had not dissected the fish I was, of course, unaware of the number, which I now find, is three or four less than in the first grilse and 13 or 14 less than in some others of the Derwent salmonoids. Nevertheless I should have regarded the number 54 (having no other light than Dr. Günther's own descriptions), as a proof of the fish being a true salmon, because the Dr. gives as his own formula for salmo salar, "Cœc. pylor., 53 to 77," and also mentions a mature male from the River Tamar in which the Pyloric appendages were only 51. Again Dr. Günther's formula for salmon trout is "49 to 61, rarely less," but in the descriptions of salmon trout in the British Museum, out of 20 specimens seven contain the minimum number 49 or less; six more contain less than the number found in the second grilse; while the average number in the remaining seven only slightly exceeds 54. On the strength of this test, therefore, we should be justified in regarding the second grilse as a true salmon.

Dr. Günther speaks of the rapid growth of salmonoids in our waters, and attributes it to the presence of the anchovies, but it is at least doubtful whether the fish would thrive better here on anchovies than in Britain on whitebait, sprats, herrings, or others of the schoolfish abounding on the coast. If the first and second grilse could be regarded as true salmon, nothing extraordinary could be found in their size, as it is about the average of grilse taken in spring on their first journey from sea. But the case is very different if they are salmon trout,—because the majority of salmon trout on the first return from sea do not weigh more on an average than from one pound to one pound and a half. That the first and second grilse were on their first journey from sea is all but certain from the presence of several of the deciduous teeth still left on the vomer, and the fact that they should both so much exceed the average weight of a large majority of the salmon trout of a similar age from the best British rivers, is difficult to explain if they are salmon trout.

Had Dr. Günther been able to examine the first smolt sent from this colony in 1869 by the light which the further conduct of the experiment has since thrown on the subject, we should never have been told that that smolt was a stunted salmon trout, because the statement that it was stunted was due to an erroneous conviction that no migratory salmon could return from the sea to a Tasmanian river, and that as we had only received one lot of ova of salmon trout in 1865, the smolt must have been three years and-a-half old. The determination of the species of the second grilse proves that the first smolt was no stunted individual; but that it was what it appeared, a healthy well-fed fish which had travelled more than 30 miles seaward in obedience to the migratory instinct, and it also proves to my mind that inasmuch as it could not be one of the fish originally hatched from an English salmon trout egg, and there had not been sufficient time for the salmon trout to have bred and produced a smolt of that age; that, therefore, that first smolt could only have been a true salmon—the whole difficulty in the determination of its species having arisen from the fact that, however valuable the tests applied may have been for the elucidation of the species of adult specimens, those tests are valueless when applied to immature fish. So with the determination of the second grilse. If we are to regard it as adult,—that is to say, if it has arrived at such a stage that there would be no further change in the anatomical details of the fish on its next journey seawards, beyond mere increase of size,—then the tests applied by Dr. Günther would doubtless be sufficient to warrant the conclusion that it is a salmon trout (*Salmo trutta*); but if, on the other hand, any further change might take place in those details, its species cannot with absolute certainty be determined till the sum of that change has been recorded; and, therefore, nothing but the capture of a full-grown specimen will ever satisfactorily set the whole question at rest.

NOTES ON THE CHLAMYDOSAURUS OR FRILLED LIZARD OF QUEENSLAND (*Chlamydosaurus Kingii*, GRAY), AND THE DISCOVERY OF A FOSSIL SPECIES ON THE DARLING DOWNS, QUEENSLAND.

BY GEORGE BENNETT, M.D., F.L.S., CORR. MEMBER OF THE ROYAL SOCIETY OF TASMANIA.

[*Read 13th July*, 1875.]

This remarkable lizard was first described by Mr. John E. Gray, in 1827, and published in the appendix to the "Narrative of a Survey of the Intertropical and Western Coasts of Australia, by Captain P. P. King, R.N. He considers it closely allied to the Agamæ, but differing from them in the peculiar frill that is appended to the neck, and named it *Chlamydosaurus Kingii.* This interesting lizard was found by Mr. Allan Cunningham, who accompanied Captain King's Expedition as His Majesty's Botanical Collector for Kew Gardens, on the branch of a tree in Careening Bay, at the bottom of Port Nelson. Mr. Cunningham's journal contains the following remarks respecting it, he says:—"I secured a lizard of extraordinary appearance, which had perched itself upon the stem of a small decayed tree. It had a curious crenated membrane like a ruff or tippet round its neck, covering its shoulders, and when expanded, which it was enabled to do by means of transverse slender cartilages, spreads five inches in the form of an open umbrella. I regret that my eagerness to secure so interesting an animal, did not admit of sufficient time to allow the lizard to show by its alarm or irritability, how far it depended upon, or what use it made of this extraordinary membrane when its life was threatened. Its head was rather large, and eyes, whilst living, rather prominent, its tongue, although bipfid, was rather short and thick, and appeared to be tubular." The colour of the tongue and inside of the mouth was yellow. The discovery of the fossil species occurred as follows:— In a letter dated Toowoomba, Queensland, July 22nd, 1874, received from my son, Mr. G. F. Bennett, he says:—"I have just returned from a visit to Gowrie Station, on the Darling Downs, and was successful in securing a good specimen of the jaw of *Notoherium Mitchellii,* a portion of the jaw of *Diportodon,* and other specimens, but the most curious of all is a small portion of a jaw with a good many teeth, either of a fish or snake." On receiving this specimen and examining it very carefully under a powerful lens, I considered it was decidedly reptilian. On afterwards showing it to Mons.

Henri Filhol, one of the naturalists attached to the Museum of Natural History of Paris (this gentleman had just arrived at Sydney *viâ* Batavia and Singapore, forming one of the French Expedition for observing the Transit of Venus at Campbell's Island, South Pacific, and brought a letter of introduction to me), he kindly gave it a very attentive examination, confirming my opinion as to its reptilian character, and on the following day informed me that he considered it a fossil of an extinct species of the *Chlamydosaurus* or Frilled Lizard of Queensland. I immediately transmitted it by post, by the mail steamer, to my friend Professor Owen, and in a letter dated November 5th, 1874, received the following reply :—"I lose no time in acknowledging yours of September 3rd, 1874, and the small box therein referred to, which has safely reached me. The portions of jaw with teeth, are those of a *Chlamydosaurus;* but of a species with a shorter, more obtuse, and higher head than *Chlamydosaurus Kingii.* I have therefore entered it, and shall find a place for it in some plate for figuring fossils, as of a *Chlamydosaurus Bennettii.* By the way, I should like to have from some competent and trustworthy observer an opinion whether the Frilled Lizard walks erect on its hind legs, or ever walks at all, or in any fashion, on that pair solely, after the manner of birds. I can understand its sitting itself up, and outspreading its frill, and perhaps snapping its teeth when attacked. But some, here, have rested their argument on *Iguanodon*, etc., walking on their hind feet, on a statement in Krefft's list of specimens in your Museum, that *Chlamydosaurus* does so."

In reply to the enquiry of my distinguished friend respecting the Frilled Lizard walking on its hind legs, I communicated to him the information I had obtained from several competent and trustworthy observers, and which led to the conclusion that the *Chlamydosaurus* did move solely on the hind legs occasionally, but when in that position the mode of progression was more hopping than walking, in some degree resembling the mode of progression as observed in the kangaroos. Mr. Krefft, who had an opportunity of observing these reptiles alive in a very large cage, says:—"It rises occasionally on its hind legs, squatting like a kangaroo. When suddenly disturbed it has this habit more particularly, sometimes it hops not unlike a bird for a short distance, say one or two yards, and then takes to all fours again. The common Lace Lizard (*Hydrosaurus varius*) has similar habits, and I have noticed some of them rise up and start, body erect, for fifteen or twenty yards. The Lace Lizard only rises up when on the ground, but the 'Frilled Lizard' does so when in trees, and probably jumps from branch to branch." The movement of the "Frilled

Lizard" on its hind legs was mentioned to me by Mr. Brown, who observed them in the vicinity of Rockhampton, and we have further confirmation of the fact by the following letter from Mr. Charles Coxen, of Brisbane, dated February 27th, 1875, who says:—"Respecting the locomotion of the *Chlamydosaurus Kingii* or 'Frilled Lizard,' I will state what came under my own observation. While on a visit in 1871 to my friend Mr. W. Archer, of Gracemere, near Rockhampton, my attention was aroused early one morning by seeing one of these reptiles standing erect on the garden path, with its head and nose in a line with its body. Not wishing to disturb it, I stood still and observed its movements, when seeing there was no desire on my part to disturb it, it quietly walked with its nose in the air amongst the shrubs; on my following it rather quickly, it ran away on its four legs for a short distance, but not being further interfered with, it again took to its bipedal progression, but on being startled a second time, it started off on all fours and ran up a tree. On mentioning this to Mr. Archer, he appeared to be aware of this peculiar habit of the reptile, and informed me that this lizard had been for a long time a denizen of his garden, and that the creature was tame, no one being allowed to frighten or interfere with it. Since making these observations, I have had an opportunity of stuffing one for the Queensland Museum, and have placed it in the bipedal position I have just described, with its frill in repose, that being in accordance with my observation of the one I saw at Grasmere, for I believe it is only when at bay, or showing fight, that the frill is erected."

In part illustration of these notes, I have sent a specimen of the "Frilled Lizard" (*Chlamydosaurus Kingii*) in spirits for the Museum of the Society.

Sydney, N. S. Wales,
May 20th, 1875.

ON THE *EUPLECTELLA ASPERGILLUM*, Owen; OR "VENUS'S FLOWER BASKET,"

A SPECIES OF SPONGE BELONGING TO THE ALCYONOID FAMILY;

AND

A NOTICE OF THE *HYALONEMA* OR "GLASS ROPE" SPONGE.

By George Bennett, M.D., F.L.S., &c., Corr. Mem. of the Royal Society of Tasmania.

[*Read* 13*th July*, 1875.]

Sponges assume a great variety of forms, some are cylindrical and cup-shaped, others are flattened, spherical, and finger shaped, varying in size from small specks to gigantic dimensions, the latter exemplified in the so-called "Neptune's Cup," (*Thalassema Neptuni*) a specimen of which is in the Museum of the Society. Some of the sponges display a great variety of rich colours, from bright scarlet and mauve, to pale yellow and rose, but the beautiful and delicate tints change when exposed to the air to a dull brownish hue. Sponges are formed of a soft glairy substance termed sarcode, which envelopes a skeleton composed of silicious, calcareous, or horny material. The first exemplified by the *Euplectella*, *Hyalonema*, *Holtenia*, *Rossella*, &c., &c.; the second by the genus Grantia, and the last by the common sponge (*Spongia communis*) forming an elastic substance extensively employed for domestic purposes.

The most delicate and beautiful of the silicious sponges are those composed of threads or filaments of almost pure silex, beautifully interlaced and terminating at the base in delicate threads of exquisite fineness like spun silk, as seen in the *Euplectella aspergillum* of Owen, popularly named "Venus's Flower Basket," resembling in its form a bouquet holder of spun glass; others form hollow cups, from which beards of long, flossy filaments are pendent, consisting of silex resembling spun glass, as in *Holtenia*, *Rossella*, &c. Another remarkable silicious sponge, is the Hyalonema, known as the "Glass Coral," or "Rope Glass;" this sponge or rather a portion of it, I had an opportunity of examining in the Museum of the Royal Society at Hobart Town, and also some specimens in the possession of Mr. James Macfarlane, of that city, who brought them from Japan, and presented the examples in the Society's Museum. The portions of the *Hyalonema* I examined consisted of a rod of twisted fibres varying in thickness, and about six or seven inches in length, encased in a brownish leathery coating, the surface of which was studded with a species of parasitical Zoophyte; the lower portion was frayed out, so that the glass threads were separated from one another. It was evidently not perfect, and a question had arisen where specimens were first seen brought from Japan, whether it was a natural production or a misdirected industry of those ingenious people. It appears that Ehrenberg took this view, when he examined the *Hyalonema*, recognising the silicious strands as the spicules of a sponge quite independent of the Zoophyte with which they were encrusted. After an examination of the specimens, the conclusion I arrived at, and the opinion I gave, was, that the Zoophyte was imperfect. On my return to Sydney, I found on reference to Professor Wyville Thompson's recent work on the "Depths of the Sea," that the conclusion I arrived at was correct, and that perfect specimens of this remarkable sponge had been obtained, not from Japan, but at first from the coast of Portugal and subsequently from the coast of Scotland. The species obtained from the coast of Portugal was discovered by Professor Barboza de Bocage, and is named *Hyalonema lusitanicum* (of which an engraving is given from which I send a copy) it is closely related to the glass rope sponges of Japan, which have so long perplexed naturalists to determine their position in the animal series, and their relation to their constant companion the parasitic Palythoa, a genus of Zoophytes. Respecting the capture of *Hyalonema* on the coast of Scotland, Wyville Thompson says :—Off the Butt of Lewis, north of the Hebrides, or western islands of Scotland, "we met in water of 450 to 500 fathoms, on two occasions, with full grown specimens of a species of the remarkable genus *Hyalonema*, with the coils in the larger examples upwards of forty centimetres in length. *Hyalonema* is certainly a very striking object, and although our specimens belong apparently to the same species, *H. lusitanicum*, of Professor Barboza de Bocage, from the coast of Portugal, it is one of the most interesting additions made to the British Fauna during our cruise." He further describes this curious sponge as follows:—"A bundle of from 200 to 300 threads of transparent silica, glistening with a silky lustre, like the most brilliant spun glass, each thread from 30 to 40 centimetres long, in the middle the thickness of a knitting needle, and gradually tapering towards either end to a fine point; the whole bundle coiled like a strand of rope into a lengthened spiral, the threads of the middle and upper portions remaining compactly coiled by a permanent twist of the individual threads; the lower part of the coil, which, when the sponge is living, is imbedded in the mud, frayed out so that the glossy threads stand separate from one another, like the bristles of a glittering brush; the upper portion of the coil, close and compact, is imbedded perpendicularly in a conical or cylindrical sponge; and usually part of the sponge-substance, is covered with a brownish leathery coating, whose surface is studded with the polyps of an alcyonarian zoophyte. Such is the general effect of a complete specimen of *Hyalonema.*" In the same work he says "*Hyalonema* was also common; but we got few perfect specimens with the sponge and glass rope in connection. The conical sponge heads were very numerous; they seemed to have been torn off by the edge of the dredge, the rope remaining in the mud, and the ropes were frequently brought up without the sponge. Almost all the ropes were encrusted with the constant 'commensal' of *Hyalonema, Polythoa fatua.* Very young examples of *Hyalonema*, with the whisp from 5 mm. to 20 mm. long, had usually no *Palythoa* on them; but when they had attained above the latter dimensions in almost every case one could see the first Polyp of the *Palythoa* making its appearance as a small bud, and its pink-encrusting cænosarc spreading round it." When the Challenger was in the South Atlantic it has been mentioned that the trawl was put down in 1,375 fathoms, and on the following day in 1,600 fathoms, between Prince Edward's Islands and the Crozets, the number of species taken in these two hauls was very large, and many of them belonged to especially interesting genera, while many were new to science. There occurred with others the well-known genera *Euplectella* and *Hyalonema*, showing the wide range of those beautiful sponges. It has only been during the last few years that specimens of the beautiful silicious frames or skeletons of the sponge belonging to the Alcyonoid family named *Euplectella* has been discovered in greater numbers, and have been brought from the Philippine Islands to New South Wales by the ships arriving from those islands with cargoes of sugar. The Euplectella is of a most singular and beautiful texture, exciting admiration by the clear transparency of its exquisite lace like work, and the delicacy with which the threads are apparently interwoven, forming a construction of delicate network not to be equalled by any human fabric. They assume for the most part the form of a cornucopia, and are attached, when partly buried in the mud, to the sand, coral rock, or other objects, even to the mud itself by a bundle of terminal fibres or threads having a silky or silvery lustre, situated at the smaller and narrower end or base of the sponge. In the living state this silicious or flinty skeleton is enveloped by a delicate gelatinous organic tissue of a pale brown colour. This beautiful sponge can now be seen in our public museums, and also in many private collections, and as I have been able to send two specimens for your Museum, some account of them may be interesting to the members of the Society. This elegant generic form of reticulate alcyonoid sponge was first described by Professor Owen, in 1841, from a specimen brought from the Philippine Islands by Mr. Hugh Cuming, and published in the Transactions of the Zoological Society of London (vol. 3, 1849.) In a letter to Professor Owen, Mr. Cuming relates how it was obtained, as follows:—"The *Euplectella* brought home by me from the Philippines, was taken by a fisherman, in ten fathoms, rocky ground, off the Island of Bohol, one of the Southern Islands of the Philippine Group. The fisherman was employed in catching a species of cod which abounds in those islands, and finding, after some time, the fish did not take his bait, he drew up his line, when to his surprise he found the specimen of Euplectella attached to his hook, near the orifice, and fearing to injure it by disentangling the hook from such a fragile substance, he cut out that portion to which the hook was attached. On his arrival on shore, at St. Nicholas de Zebu, he made a present of it to the Governor of the town. On my arrival a few days after, I was introduced to the Governor, who, upon knowing the object of my visit to the island, presented me with it, as the greatest curiosity he had to offer me, as he had never seen the like before. On my showing it to the Bishop of that city, and the principal inhabitants, they confirmed the opinion of its rarity expressed by the Governor." This beautiful and singular marine production forms part of a member of the lowest class of organised bodies, being the skeleton of a species of sponge, belonging to the cylindrical or reticulate, or alcyonoid family. "If," says Professor Owen, "the basal aperture of the cone were open, the resemblance to some of the known reticulate alcyonoid sponges would be very close, especially to that called *Alcyonellam gelatinosum* by Blainville, its closure by the reticulate convex frilled cap, in the present instance establishes the generic distinction; and, in the exquisite beauty and regularity of the texture of the walls of the cone, this species surpasses any of the allied productions that I have yet seen, or found described. I propose, therefore, to name it *Euplectella aspergillum*," the generic name being derived from Eu, well; and Plecto, to weave. The specific name given by Professor Owen, is simply a translation of the popular name by which it is known among the fishermen at the Philippine Islands, who call it "Regadera," which means "Watering Pot," from the resemblance of the reticulated cap at the upper end to the spout of a watering pot; but Dr. J. E. Gray has given to it, a very pretty and appropriate popular name of "Venus's Flower Basket." *Euplectella* is an excellent generic name, being indicative of the exquisite regularity and complexity of the interweaving of its component threads, resembling the most delicate spun glass, and of a silvery lustre. The specimens brought to Sydney, New South Wales, varied in size from eight to fifteen inches in length, and of a proportionate diameter. An account was published in the annals of Natural History (vol. 3, 4th series, 1869) of the method adopted to capture the *Euplectella*. It was as follows :—" The only place where the Regaderas are to be found is about three miles from the shore, in front of the small village of Palisay, which is about five or six miles south of the town of Zebu, Island of Zebu, Philippine Islands. The mode of catching them is very ingenious, and is as follows :—When the tide is about its full, the natives go out in very small canoes to the bed in which they are found, which is about a mile in circumference, and from 130 to 135 fathoms deep. The native, when he considers he has come to about the extremity of the bed, then lets drop his fishing tackle, composed of a piece of iron of the shape of a T, to the two extremities of which are attached two flexible pieces of bamboo, armed with hooks. This sinks to the bottom, and the native sits perfectly still in his tiny canoe, which is then gradually drifted by the tide or current over the ground on which the Regaderas are found ; so soon as he feels that his trawling apparatus has caught something, he begins to haul his line gently in, and generally finds two or three impaled on the hooks. When taken out of the water the Regaderas are dirty and yellow, but after being put into fresh water, or exposed to the rain, and dried in the sun, they become perfectly white. The bottom of the sea where the Regaderas are found, is composed of soft mud and sand. The extended fibres or root of the Regadera is embedded in this, and the top or broad part always looks, as the natives say, to the setting sun. In the Regadera, when fished up, are generally found from one to three small animals of the crab species, of about the size of very small shrimps. The hooks, of course, often catch Regaderas without bringing them up, and many that have been recovered show signs of having a new piece of netting put over the part torn by the hook. It is said that the first Regadera discovered in Zebu was sold for fifty dollars, and that a Dr. Caloo, who took it to Manilla, was then offered two hundred dollars for it ; for some time after that they continued to be worth sixteen dollars each. It was only in 1865 they became abundant, through the present bed of them being discovered." The Regaderas' usual form is that of a cornucopia, although some have been occasionally seen nearly straight, but those are comparatively rare. The inclination of the growth is outward. When first caught they are covered with a yellowish brown gelatinous tissue veiling the beautiful texture of the crystal framework.

The first specimen obtained by Mr. Hugh Cuming was sold in London for thirty pounds, others afterwards realised from ten to fifteen pounds; but fresh discoveries having lately been made, they have become more plentiful, and the prices have been very materially reduced. In nearly the whole of the specimens I examined, there were different species of crabs and other crustacea, imprisoned in the crystal frame without any opening to admit a possibility of escape, as secure as if in a corked or sealed bottle, the mystery of their entrance has puzzled learned naturalists, as the apples in the dumplings did George the Third, or as the liqueurs in the sugar plums have also mystified many wise heads. A question arises, how they got in? This can only be satisfactorily explained, either by their having effected an entrance previous to the completion in growth of the skeleton of the sponge, or what is still more probable, when a rent has occurred accidentally in the delicate net work, an entrance was effected before the injury had been repaired, and which, when completed, render their escape impossible, for that this sponge has the power of secreting silicious matter for the reparation of any injury it may sustain, can be proved by the examination of specimens in which repairs of injuries have been made; for the restoring power of the sponges displays remarkable activity of their vital power as shown by the rapidity and strength with which injuries are repaired, for according to experiments made by Mr. Bowerbank, injuries that had been sustained by some sponges were repaired in less than twenty-four hours. By some naturalists it was supposed that the crabs were the architects of this fairly-like structure, but they might have reflected, that although crabs have the power of secreting calcareous, they cannot produce a silicious or flinty matter, but as this class of sponges is known to be capable of creating this silicious material, we may readily be convinced that this elaborate and exquisitely delicate lace tracery is their work. In 1857 Professor Owen and Dr. Arthur Farre, published in the 22nd vol. of the Linnean Transactions, an account of another beautiful species of Euplectella, under the name of *Euplectella cucumer*, or Cucumber Euplectella, from the peculiarity of its form, which when first seen in the engraving, might readily, and has been mistaken for the representation of that singular vegetable production the Cactus, and it certainly bears a close resemblance to the form of some of the species. It is stated in the description to have been given to Captain Etheridge, R. N., by the King of the Seychelle Islands, but as no monarch resides at that group, it is most probable a mistake for the ruler of the Comoro Islands, which are situated between the East Coast of Africa, and the North point of Madagascar, or for the Sultan of the Island of Zanzibar. Professor Owen says that "To the question put by almost every one to whom the *Euplectella* is shown, as to how the threads could have been so regularly, yet intricately interwoven, I have sometimes replied, that there has been no such thing as interweaving in the case; that no thread, as such, was ever laid across another in the construction of the Euplectella, that the analogy of human textile fabrics does not apply to this beautiful natural object. In artificial lace work, the several stages of a complex result must be taken in the succession indicated by painful and exact calculation; in organic lace work, different stages are done at once. Thus it is that the Divine works surpass those of man's utmost ingenuity. The threads of the *Euplectella* were not first spun, and then interwoven, but were formed as interwoven, the two processes going on simultaneously or 'pari passu.' Just as in the cancelleous texture of bone, the plates of bone are not first formed, and then fitted to one another, as in building a house of cards; but the forming and the fitting go on together in the course of molecular growth. I presume also that in the beautiful object which we call the *Euplectella* we have but its skeleton, and that in the living state the exquisite structure of the flinty framework may be veiled by the delicate gelatinous enveloping organic tissue." This beautiful sponge will now be still more plentiful as it has recently been discovered on the coast of Portugal, for in a letter in the *Daily News* from that journal's special correspondent on board the "Challenger," he says, "on the evening of 4th of March, 1873, Professor Wyville Thompson gave a popular lecture on the objects of the expedition, and after giving an account of the very satisfactory results which they had already obtained, the Professor described some of the most interesting objects brought up by the dredge. One of the most interesting of these objects was a beautiful specimen of the Philippine Island Sponge (*Euplectella aspergillum*) obtained off the coast of Portugal at a depth of 2,000 fathoms. This is the first specimen of this species of sponge ever found in any waters but those of the Philippine Islands, and it was always believed to be indigenous to them."

Sydney, New South Wales,
June 2nd, 1875.

ON THE FRESHWATER SHELLS OF TASMANIA.

By Rev. J. E. Tennison Woods, F.G.S., F.L.S.

[*Read 9th August*, 1875.]

Introduction.—No attempt has yet been made to arrange the freshwater shells of Tasmania. The land shells have been carefully catalogued by Mr. Legrand, so that little remains to be desired in that department of our island fauna. The marine shells have received much attention from most eminent naturalists, though a list carefully criticised, with a well arranged account of the bibliography is much wanted. But the freshwater shells have been almost entirely neglected. There have been one or two descriptions of Physa in Reeve, and one or two other notices of species scattered through various scientific publications, but the majority of the shells here described are new to science. This comparative neglect has one advantage, which is, that the whole can be done without a troublesome synonomy. There are other advantages in describing species in their native country. Mistakes as to the habitat are thus avoided by the examination of large collections, all the variations to which any species is subject can be observed, and details which in isolated specimens might be regarded as of specific value are rightly estimated, and the unnecessary multiplication of species obviated. For this reason I am sure that it is no real gain to science to send one or two natural history specimens to scientific men at home no matter how eminent they may be. In this way, a hopeless confusion of names and habitats arises, no accurate knowledge is gained, and science is, in fact, really retarded. I say this because in the very subject I am now writing upon, I find in various eminent scientific works descriptions of Australian freshwater shells, which I have very little doubt were derived from Tasmania; and, further, I also find shells described as Tasmanian, which the most careful and painstaking collectors assure me have never been found in this island. Such instances I will note as I proceed.

The first fact that strikes us in the examination of the freshwater fauna of Tasmania is its perfect distinctness from that of Australia. The latter is well marked, and there is the greatest distinctness between shells gathered in different parts of the continent. But with this fact there is another still more remarkable, that one of the Tasmanian Physæ, and that the most common seems scarcely to be distinguished from the common *Physa fontinalis* of Europe, and it is found in places which preclude the supposition of its having been introduced. Moreover the *facies* or general character of our freshwater shells is not Australian, which certainly is most singular, considering that the geographical relations of the two places are so close. These facts, however, are quite in keeping with the teachings of both the zoology and geology of Tasmania, namely, that the island has been separated from the continent in very remote periods of the earth's history, perhaps since the close of the mesozoic.

Secondly, we find in the freshwater shells of Tasmania a singularly restricted habitat for some species, and an unaccountably capricious distribution for others. Thus some species are only found in small inland lakes, and others are found in one restricted habitat, and then strangely reappear at other and remote parts of the island, while between the two localities there seems to be no present communication. Every species, too, which has a wide range has a local variety. It would seem from these facts that the present physical features of Tasmania have undergone little change in recent times, but the outpouring of lavas, etc., in tertiary times, of which there is such evidence, has altered some of the inland characters, and so divided districts which may have been formerly united in their freshwater streams. This, however, is merely a supposition, which is only one of many which may be offered in explanation of the phenomena.

There are in all 32 species of freshwater known shells in Tasmania, that is to say, 28 univalves and 4 bivalves; the proportion of bivalves to univalves for Britain is 29 to 9. The Tasmanian species are distributed in the following genera:—Physa, 12; Limnea, 4; Bythinia, 7; Ancylus, 2; Pomiatopsis, 1; Planorbis, 1; Assiminea, 1. The latter is a very doubtfully referred to freshwater, being usually found only in brackish streams. Still, as it seems to live in streams where the tidal influence of the salt water is scarcely felt, I must place the one Tasmanian species amongst the list of our freshwater fauna.

Of the genera, Physa is the largest in number, and this is the case also in Australia, where it takes the place occupied by Limnea elsewhere. But the Australian species are generally very globose with short spires or with a peculiar elongation of the penultimate whorl, with a deeply impressed suture, and these features are not marked in the Tasmanian species. Their form rather approximates to the European and American types. The only exception is in *P. ciliata*, which has a short spire, and in the Bruni Island variety a globose habit. Those from Lake Dulverton are not globose. This species is also remarkable for being clothed with long reddish hairs in its young state, a feature not seen in any other of its congeners except one from India. It is very strange that this species is only found in Lake Dulverton and Bruni Island, places more than eighty miles apart, and separated by an arm of the sea. In Lake Dulverton is found *P. mamillata*, which is also found in Bruni Island. I may here remark that a variety of the latter exactly corresponding with Sowerby's *P. attenuata* is found in the same lake, and though described as coming from Australia, Mr. W. Legrand assures me it came from Lake Dulverton, as it was sent to Mr. Sowerby from Tasmania by Mr. Legrand. Under these circumstances, the species and name should be suppressed, but the matter is one for Australian naturalists. The common Physa of Tasmania I have named *P. tasmanica.* It varies very much according to the place in which it is found, and is closely allied to *P. fontinalis* of Europe. The number of Physas (12) for such a small island is very large, and it may be that some of the species will yet need reduction, yet it must be remembered that Tasmania is an extremely mountainous country. The ridges acting as complete barriers between different parts of the island.

The genus Bythinia contains species which may possibly need further reduction. Some authors have referred those species, of which the Tasmanian creeks, etc., are so full, to the genus Paludestrina. Under the head of that genus I have given my reasons for classing them as I have done. The partly calcareous operculum appears to me, in the absence of the animal, decisive of the point. Two species of Paludestrina have been described by Mr. Brazier as from Tasmania in the Zoological Society's proceedings, but I have never been able to find any collector who has seen them. I therefore conclude there is some mistake in the habitat. Nevertheless I have included them in the list, hoping that future investigations may throw some light on the point.

The four species of Limnea do not call for any remark except that they are local and very distinct from any European or Australian congeners.

The two species of Ancylus are very remarkable, in fact, Tasmania can boast of the largest and finest species of Ancylus known, being so distinct from every other species, that at one time it was proposed to erect a separate genus for its reception. The other species in no way resembles it, being small and inconspicuous.

The other genera have nothing peculiar about them. They are the representatives of European species in our streams. It is said that our Pomiatopsis is found in Australia, but as there it is claimed as a Blanfordia, the indentification is doubtful.

It is remarkable that there is only one *Unio* in Tasmania, and that is entirely restricted to rivers emptying themselves on the north side of the island.

Altogether the fresh water shells of Tasmania present a novel and peculiar character which, when carefully studied, may help to explain much of the distinctive zoology and geology of the island. So far as my observations go, its results seem more adverse than favourable to the Darwinian hypothesis, but the nature of this paper prevents my stating at any length the reasons which incline one to this opinion.

UNIVALVES. ANCYLUS. Geoffroy, 1767.

(Traite des coquilles de Paris par Etienne Louis Geoffroy, Paris, 1767.)

Testa tenuis, oblique conica, apice acuto, posterius inflexo, apertura ovali; marginibus simplicissimis.

Shell thin, obliquely conical, apex acute, posteriorly inflated, aperture oval with quite simple margins.

These freshwater limpets are air breathers, and not numerous in species. They are found, says Mons. Bourguignat (who has made the genus the subject of a most elaborate paper in the Zool. Soc. Proceed. for 1853 p. 77) in all the great divisions of the world, but the section *Velletia* has hitherto only been found in Europe. About 50 species are known.

Ancylus cumingianus, *Bourguignat (loc.* cit.) *A. testa antice gibboso-convexa, postice concava, apice recurvo, contorto, ad marginem aperturæ lateralem dextrorsus dejecto, ac duos anfractos præbente; anfractibus depressionem apicalem convexitate penultimi obtegentibus. Testa parum diaphana, lævi vel striata, præsertim ad aperturam; anfractibus apicis sæpissimi rugoso-radiatis; epidermide supra cornea vel virescente, intus albida; apertura subangulato-rotundata.*

Shell gibbosely convex anteriorly, posteriorly concave, apex recurved, twisted and dextrally turned down to the lateral margin of the aperture, so as to make two whorls; whorls covering the apicial depression by the convexity of the penultimate. Shell slightly diaphanous, smooth or striate about the aperture, the apicial whorls very often rugosely radiate, epidermis greenish or horny above, white within; aperture subangulately rounded. Length 6—7. Breadth, 5—5½. Alt., 2½—3 mill. But specimens have been placed in my hands by Mr. Legrand of nearly double this measurement.

This species is truly the finest Ancylus known, having no congeners in any way approaching it. *Latia neritoides* of New Zealand may be compared with it in some respects. Its peculiar features are its size, the excessive deviation of the apex, its peculiar spiral apex, its mode of growth and the form of its aperture. These separate it completely from all species hitherto known. Habitat, in streams between New Norfolk and Hamilton. The large ones referred to from a small stream running into the Derwent near Dunrobin.—*R. Maddock.*

ANCYLUS TASMANICUS. n.s. *A. testa parva, oblongo-ovata, diaphana, cornea, concentrico striata, et subtillisime rugoso-radiata, epidermide nigro plus minusve induta et maculata, apice obtuso, postico; apertura postice subatenuata.*

Shell small, ovate, diaphanous horny, concentrically striate and very faintly rugosely radiate, more or less covered and spotted with a black epidermis, apex obtuse, posterior aperture subattenuate posteriorly. Long., 3—3½. Lat., 1½—2. Alt., 1½—2.

Common near Hobart Town in streams, on stems of water-cress (*Nasturtium officinale.*)

LIMNÆA. LAMARCK, 1799.

Testa oblonga, interdum turrita; spira exserta, apertura integra, longitudinalis. Labrum acutum, inferné ad sinistram revertens et ascendens, in columellam versus aperturam decurrit, plicamque obliquam mentitur. Operculum nullum. Hist. Nat. des Anim. s. Verteb. 2 edit par Deshayes et Milne Edwards. Paris, 1838.

Shell oblong, sometimes turretted, spire exsert. Aperture entire, longitudinal. Outer lip acute returning to the left, and ascending decurrent with the columella towards the aperture making a false oblique plait. No operculum.

The Limneæ are world-wide in their distribution, and inhabit ponds, lakes, and running water. The species have a wide distribution, so that it is difficult to distinguish between those found in America and Europe. Sowerby says that the Australian species have generally an inflated form, while Lovell Reeve (Land and Freshw. Moll of Brit. p. 155) says, "In India, neighbourhood of Calcutta, the shell is cylindrically oblong. In Malayan Islands and Punjaub districts of India it is of a peculiarly silvery horny substance, marked with opaque white brown streaks. Western Asia, north of the Himalayas, over the whole of Europe, extending to Greenland, and over all the United States, the Limneæ produce a dull horny malleated shell. The inland waters of Central America and Australia have few Limneæ. They are chiefly inhabited by Physæ.

1. LIMNÆA TASMANICA *n.s. P. testa tenui, pellucida, eleganter pyramidata, corneo-fulva; spira elevata, acuminata, apertura longitudine, paulo superanti; anfractibus (5-8) obliquis; ultimo anfracto inflato; apertura late ovata; labio externo tenuissimo, fragilis; labio interno subexpanso, plica inconspicua, columella alba, vix contorta.*

P. shell thin, pellucid, elegantly pyramidal, horny fulvous; spire elevated acuminated, aperture little larger than the spire, whorls 5 to 8, oblique, last whorl inflated, aperture widely ovate ; outer lip extremely thin, fragile ; inner lip somewhat expanded, columella fold inconspicuous ; columella white, scarcely twisted. Long. 25. Lat. 12. Apert. 15 mill. But this is a large size.

Habitat.—Everywhere in South Tasmania about Hobart. This shell is very like *Limnæa stagnalis*, Linn, but the spire is not so attenuated, the aperture not nearly so expanded, the columella fold is inconspicuous, the columella white, and the shell much smaller and thinner. It also comes near some American species.

2. LIMNÆA HUONENSIS. *L. testa tenuissima, pellucida, nitida, ventricosa, pallide cornea, rectiuscula, spira brevi, acuta; anfractibus (4) productis, labio externo tenuissimo, acuto; labio interno expanso; plica contorta, columella arcuato.*

Shell very thin, pellucid, shining, ventricose, pale horny, rather straight, spire short, acute, whorls 4, penultimate whorl rounded; last whorl large, concave behind the columella, aperture ovate, produced; outer lip very thin, acute; inner lip expanded, fold twisted, columella arched. Long. 8. Lat. 4½. Apert. 5 mill.

Habitat, River Huon, upper part, Craycroft River, &c. This very interesting species comes somewhat near *L. pinguis* of America.

3. LIMNÆA HOBARTONENSIS, *n.s. L. testa ventricosa, subumbilicata, obliqua, pallide-cornea, spira brevi, anfractibus 4, duobus apicalibus parvis, rotundis, penultimo majusculo, ultimo inflato; post columellam concavo, apertura obliqua, pyriformi, antice oblique expansa; labio externo tenui; labio interno vix expanso, plica quasi obsoleta.*

L. shell ventricose, subumbilicate, *oblique*, horny, spire short, whorls four, the two apicial ones small, rounded, the penultimate somewhat larger, the last inflated; concave behind, the columellar aperture pyriform, obliquely expanded in front, outer lip thin, inner lip expanded, columellar plait almost obsolete. Long. 11. Lat. 8. Aperture 9 mill.

Habitat, very common about waterworks near Hobarton. Closely allied to preceding, but the spire is more conspicuous and the shell oblique, more solid, and altogether larger.

4. LIMNÆA LAUNCESTONENSIS *n.s. L. testa tenuissima, pellucida, alba, nitidissima, ventricosa, rectiuscula; spira brevi, acuta; anfractibus 4, ultimo magno, post columellam concavo; apertura pyriformi; labio externo expanso, acuto, fragilis; columella arcuata, plica inconspicua.*

Shell very thin, pellucid, white, very shiny, ventricose, somewhat straight, spire short, acute, whorls four, last large, concave behind the columella ; aperture pyriform ; outer lip expanded, acute, fragile; columella arched, plait inconspicuous. Long. 15. Lat. 9. Aperture 11 mill.

Habitat, Creek near Launceston. While in habit this shell much resembles the two preceding it is larger and of shining white or silvery lustre. I also think that there are signs of a band circling the shell formed by two parallel lines.

PHYSA.

Genus Physa Draparnaud. *Hist. Nat. des Moll. &c., de la France, 1805.*

Testa fluviatilis, cornea, tenuis, spiralis, sinistrorsa, plerumque ovato-acuminata; labio externo acuto, simplici; labio interno expanso, cum columella continuo; columella contorta, uniplicata, operculum nullum.

Shell fluviatile, horny, thin, spiral, sinistral, generally ovate, acuminated; outer lip expanded, continuous with the columella; columella tortuous, singly-plaited. No operculum.

The Physæ may be considered sinistral or reversed Limneadæ. They are most numerous in warm countries, but are found in Britain. The usual species are found in Europe and South Africa, and they prefer running streams.

1. P. APERTA. *P. testa parva, brevi, ovata, inflata, epidermide olivaceo-fusca induta; spira brevissima, anfractibus duobus, ultimo inflato, superne sub-gibboso; apertura magna, lata, intus sub cœrulea, columella contorta, plica prominula.*

Shell small, short, ovate, inflated, covered with an olive brown epidermis; spire very short, with two whorls, last whorl inflated, rather gibbous above: aperture large, broad, bluish within, columella tortuous, fold rather prominent. Sowerby, in Reeve's Icon. Plate xi., figs 88, a b.

Habitat, creeks between Hamilton and New Norfolk, Tasmania.

2. P. EBURNEA. *P. testa gracili, obliqua, subfusiformi, polita, alba, fulvescenti, semipellucida; spira acuminata, quam apertura longiori; anfractibus obliquis, declivibus, attenuatis; apertura breviuscula, subauriformi, intus fusco rubescenti; columella contorta, alba medio interdum incrassata.*

Shell slender, oblique, rather fusiform, polished white fawn, semipellucid; spire acuminated, longer than the aperture, whorls oblique, sloped, attenuated; rather short, subauriform, reddish brown within, columella tortuous, white, sometimes thickened in the middle.

Sowerby, in Reeve's Icon. Pl. xi., figs 89 a. b.

Habitat, creeks near Launceston.

3. PHYSA MAMILLATA. *P. testa elongata, fusca, antice subexpansa; spira quam apertura breviuscula; anfractibus apicalibus* *minutis, acuminatis, antepenultimo inflato gibboso, penultimo inflato, gibboso, elongato; ultimo anfractu attenuato, subcylindrico, antice oblique subexpanso; apertura oblonga, intus subviolacea, columella tenui, contorta, plica elevata.*

Shell elongated, brown, anteriorly somewhat expanded, spire a little shorter than aperture, spiral whorls minute, acuminated, antepenultimate inflated, gibbous, penultimate inflated; last whorl attenuated subcylindrical, anteriorly obliquely rather expanded, aperture oblong, rather violet within, columella thin, tortuous plait elevated. Length 27; breadth at aperture 7 mill.

Sowerby, in Reeve's Icon. Pl. xi., fig 90.

Habitat, Lake Dulverton.

4. P. NITIDA. *Sowerby. P. testa parva, subfusiformi, pallide fulva, lævigata, obliqua; spira breviuscula, anfrac. apicalibus acuminatis, parvis, penultimo inflato; ultimo anfrac. ovato, tumidiusculo, antice rotundato; apertura ovato, columella contorta, plica inconspicua.*

P. shell small, subfusiform, pale, fulvous, smooth, oblique; spire rather short, spiral whorls acuminated, small, the penultimate inflated; last whorl ovate, rather tumid, anteriorly rounded; aperture ovate, columella tortuous, plait inconspicuous. Length from 6 to 9, breadth from 3 to 4½ mill.

Reeves' Icon. Pl. xii., figs 98 a. b.

Habitat, in creeks S. E. Tasmania.

5. P. BRUNIENSIS. *Sowerby. P. testa parva, oblonga, angusta, pellucida, nitenti; spira breviuscula, anfrac. 3, distinctis, prope suturam gibbosis, ultimo oblongo; apertura angustiuscula, columella tenuissima, plica, inconspicua.*

P. shell, small, oblong, narrow, pellucid, shining; spire rather short, whorls three, distinct, gibbous near the suture, the last oblong; aperture, rather narrow, columella very thin, plait inconspicuous.

Habitat, Bruni Island. Reeve Icon., pl xii., fig. 99.

6. PHYSA VANDIEMENENSIS. *Sow. P. testa solida, subquadrata, fumoso-cornea; spira brevi, anfrac. paucis, subangulatis; ultimo anfractu oblongo, prope suturam angulato; apertura subquadrata, intus obscurè purpurascenti; labio externo antice expanso, columella contorta, recurva.*

P. shell solid, rather square, smoky horn color; spire short, whorls few, subangular; last whorl oblong, angular near the suture; aperture squarish, dull purplish within, outer lip anteriorly expanded, columella tortuous, turned backward. Length 17. Breadth 8.

Habitat, northern Tasmania. I have never seen this species.

Reeve's Icon. Pl. viii. fig. 57.

Sowerby remarks of this species that its oblong, square, angular form is unusual in the genus, but that this only appears strongly in mature specimens.

7. PHYSA HUONENSIS, *n. s.* *P. testa, parva ovato-fusiformi, pellucida, nitente cornea; spira subproducta; anfr. (5), apicalibus acuminatis, parvis, penultimo longiusculo; apertura producta, auriformis; columella tenui, arcuata, plica vix visibilis.*

P. shell small, ovately fusiform, pellucid, shining, horny; spire sub-produced; whorls (5) the spiral acuminated, small, penultimate somewhat long, aperture produced, auriform; columella thin, arched, fold scarcely visible. Long. 8, Lat. 3. Aperture, 4 mill.

This shell is very distinct from *P. bruniensis* being larger and having the aperture regularly produced, but it has much the same habit.

Habitat, Huon River, near Victoria. Legrand.

8. PHYSA. LEGRANDI. *n.s.* *P. testa fusiformi, acuminata, tenuiter striata, subpellucida, pallide fulva, in partibus fusca; spira producta, attenuata, apice acuminato; anfrac (6) obliquis, attenuatis; ultimo anfractu oblongo; apertura producta, auriformis, columella arcuata, plica conspicua.*

P. shell fusiform, acuminated, finely striated; sub-pellucid, pale brown, dusky in parts; spire produced, attenuated; apex acuminated, whorls 6, oblique, attenuated, last oblong; aperture produced, auriform, columella arched, plait conspicuous. Length 15, breadth 7 mill.

This shell, which may be a large variety of the next species, has the acuminate oblique habit, which may be said to be the typical form of so many Australian and Tasmanian species.

Habitat, creeks Cambridge, near Richmond, Tasmania.

9. PHYSA TASMANICA, *n.s.*, *P. testa ovata, tenui, nitenti, pellucida, pallide fulva, rufa, fusco-subviridi, olivacea vel fusco-cornea, pallide lutea et subalba: spira brevi, acuminata; anfractibus (5) declivis; apertura obliqua; columello alba, tenui, contorta, plica subconspicua; labio interno tenuissimo, recurvo, cum columella continuo.*

P. shell ovate, thin, shining, pellucid, pale fulvous, or reddish or brownish green, or olive, or horny brown, occasionally pale yellow and almost white; spire short, acuminated; whorls, five, sloping; aperture oblique; columella white, thin, twisted, plaits rather conspicuous; inner lip very thin, recurved, and continuous with the columella. Length from 8 to 13 mill., breadth from $4\frac{1}{2}$ to $7\frac{1}{2}$ mill.

This shell which appears to have escaped the notice of previous naturalists is the common Physa of the country, and is found in all the inland streams. It is, however, so closely allied to the *Physa fontinalis* which is diffused over Great Britain and Europe that we may well doubt if it be distinct. If not, has it been introduced? It is very hard to suppose this seeing the remote places where it is found. The shell varies much in color according to the locality. Specimens from streams near the Great Lake are reddish, those from the Clyde olive, and the Coal River specimens very varied. Five varieties, with many examples of each, were furnished me by Mr. Legrand. To judge from the figure alone in Reeve's Icon. the species would be taken for *P. nitida*, but the latter is a much smaller shell, with a wider aperture and more globose habit.

10. PHYSA CILIATA *n.s. P. testa subovata, fusco-cornea, longitudinaliter striata, lineis spiralibus, sub-distantibus, ciliatis, cincta; spira brevi, acuminata, anfrac. (5) declivis, penultimo inflato; apertura subovata, magna; columella alba, plica conspicua.*

P. shell subovate, horny brown, striate lengthwise, girdled with spiral subdistant ciliated lines; spire short, acuminated; whorls five, sloping, penultimate inflated, aperture subovate, large; columella white, plait conspicuous. Length 17 mill., breadth 8 mill.

Habitat, Lake Dulverton, and Bruni Island.

This ciliated form is quite exceptional in the genus, only one other being found in India. That species is, however, cancellate, and of a different color, with an angulated aperture, though in general form not unlike the present species.

11. PHYSA TASMANICOLA *n.s. P. testa minutissima, ovata, long: striata, luteo-cornea, pellucida; spira breviuscula, anfrac. (4) distinctis, declivis, ultimo oblongo; apertura angustiuscula, columella tenui, plica inconspicua, labio interno cum columella continuo, recurvo.*

P. shell very small, ovate, longitudinally striate, yellowish horny, pellucid; spire short; whorls four, distinct sloping; last whorl oblong, aperture rather narrow, columella thin, plait inconspicuous, inner lip continuous with the columella and recurved. Length 4, breadth 2 mill.

Habitat, found by the Rev. H. D. Atkinson in a water-hole, Mount Murray, East Coast.

This species is closely allied to *P. bruniensis* but is a stouter shell, more globose, not gibbous at the sutures, and not with the peculiar shining brilliancy of that shell.

12. PHYSA HUONICOLA, *n.s., P. testa gracilis, angusta, fusiformi, fulva, nitida, intus albida, solidiuscula, spira elongata, anfractibus (6), obliquis, apicalibus parvis, plica columellari obsoleta; labio externo sinuato; labio interno albo, reflexo.*

P. shell graceful narrow fusiform, fulvous, shining, whitish within, somewhat solid, spire elongated, whorls (6) oblique, apicial ones small, columella fold obsolete; outer lip sinuous, inner lip white, reflexed. Length 15, breadth 5 mill. Proportionate length and width of aperture to whole dimensions, length 6—15, width 3—5.

Habitat, Upper Huon River. A very distinct fusiform species much larger and more solid than *P. huonensis.*

BYTHINIA. Gray. 1821.

Testa turbinàto-conica subumbilicàta, fulvo-viridà, pellùcida, lævigata anfractibus 5-7, plus minùsve rotundàtis, epidermidè obscuré corneà indùtis; apertura pyriformé-ovàta, integrà.

Shell turbinately conical, subumbilicate, fulvous green, pellucid, smooth; whorls 5 to 7, more or less rounded; clothed with an obscurely horny epidermis, aperture pyriformly ovate, entire.

It has been generally believed that no Bythinia exists in Australia and Tasmania, and the shells here described have been classed by some naturalists as Paludestrina, D'Orbigny. This genus was, however, erected for semi-globose solid thick shells with a short obtuse spire, and a callous columella, with which description none of the following would agree. But they do agree with Gray's genus of Bythinia, especially in this that the operculum is partly horny and partly, as far as I have been able to ascertain, calcareous. This feature should, it seems, enhance the importance of the other details in assigning a true position to the shells. It is a fact, however, that we have in the freshwater streams of Tasmania many species of a univalve spiral shelled mollusc so like the Bythinia of Europe, Asia, North Africa, and North America, that I am forced to include them in that genus, and believe that Australia is not an exception to the world wide diffusion of Bythinia. The Tasmanian species are all very small.

1. Bythinia legrandi, *n. s. B. testa minima, solidiuscula, elongato-conica, epidermide incompleta, obscure olivacea, spira obtusa; anfractibus (5-5½) rotundatis, apertura producta integra, pellucida, margine acuto.*

Shell small, somewhat solid, elongately conical, with an obscurely olive, incomplete epidermis; spire obtuse, whorls (5 to 5½) rounded, aperture entire, produced, pellucid, margin acute. Length, 2; breadth, 1 mill.

Habitat, Brown's River.

This shell is distinguished by its size, solidity, obtuseness, and few whorls. It retains these characters so constantly under every circumstance that it cannot be regarded as a mere variety.

2. Bythinia pontvillensis, *n.s. B. testa turbinato conica, obtusa, pellucida, nitida, fulvo-cornea epidermidé pallide lutea, anfractibus, (6) rotundatis, ultimo anfractu sub-inflato, apertura ovato, ab ultimo anfractu disjuncta.*

Shell turbinately conical, obtuse, pellucid, shining fulvous, horny, with a pale yellow epidermis; whorls (6) rounded, last whorl subinflated, aperture ovate, disjoined from the last whorl. Length, 3; breadth, 1 mill.

Habitat, Jordan River, near Brighton. Augustus Simson.

A very distinct but small species, with the whorls sometimes almost entirely separate.

3. Bythinia dulvertonensis, *n. s. B. testa turbinato-conica, fulva, epidermide alba, spira obtusa, anfractibus (6) rotundatis; apertura ovata, superné angulata, integra, ab anfractu distincta, intus albida.*

Shell turbinately conical, fulvous, with a white epidermis; spire obtuse, whorls (6) rounded, aperture ovate, angulated above, entire, distinct from the whorl, whitish within. Length 3; breadth 2 mill.

Habitat, Lake Dulverton. More turbinate than any of the preceding species. Under the microscope the epidermis is found to consist of small, oval, silvery scales.

4. Bythinia huonensis, *n. s. B. testa elongata, pyramidata, attenuata, fumoso-cornea, nitida, epidermidé fusca; spira elevata acuminata, anfractibus (8) vix obliquis, duobus apicalibus aliquando subinflatis, apertura pyriformi; labio interno reflexo.*

Shell elongate pyramidal, attenuate, smoky horn, shining, with a blackish epidermis; spire elevated, acuminated, whorls (8), scarcely oblique; the two apicial sometimes inflated, aperture pyriform; inner lip reflected. Length 4. Breadth 1½ mill.

Habitat, Huon River. A very distinct and interesting species, with a pyramidal habit.

5. Bythinia unicarinata, *n. s. B. testa elongato-conica, tenui, semi-pellucida, fumoso-cornea, anfractibus (6) rotundatis, duobus ultimis unicarinatis, carina interrupta; apertura ovata, integra crassiuscula.*

Shell elongately conical, thin, semi-pellucid, smoky horn, whorls (6) rounded, two last with one interrupted keel; aperture ovate, centre somewhat thickened. Length 4. Breadth 1½ mill.

Salmon Ponds—Not common.

6. Bythinia dunrobinensis, *n. s. B. testa elonjato-pyrimidata, tenui, pellucida, albida, epidermidé pallide rufa vel atra maculata; anfractibus (6) planatis regulariter decrescentibus; spira obtusa; apertura pyriformi, integra; labio interno superné reflexo.*

Shell elongately pyramidal, thin, pellucid, whitish, spotted with pale or black epidermis; whorls (6) regularly decreasing; spire obtuse, aperture pyriform; inner lip reflected above. Length, 3; breadth, 1 mill.

The Ouse near Dunrobin. A pale narrow shell longer and more slender than any of its congeners.

7. Bythinia tasmanica, *n.s. B. testa turbinato-conica, solidius-*

cula, olivacea; densè squamata, squamis minutissimis, nitidis, ovatis; spira acuta; anfractibus (6) rotundatis, regulariter decrescentibus; apertura integra, ovata.

Shell turbinately conical, somewhat solid, olive, thickly covered with very minute shining ovate scales; spire acute; whorls (6) rounded, regularly decreasing, aperture ovate, entire. Length 4, width 2 mill.

Habitat, creeks throughout Tasmania. In old specimens especially near Hobarton the scales are a good deal hidden by green deposits of confervoid spores.

POMIATOPSIS. Tryon.

(Contributions to Conchology. New York, 1862.)

Testa parva tenui, lævigata, elongata, subumbilicata; spira turrita, apertura ovata; labio interno reflexo. Operculum corneum.

Shell small, thin, smooth elongate, sub-umbilicate. Spire turreted. *Aperture ovate, inner lip reflected. Operculum horny.*

1. Pomiatopsis striatula. Menke (Moll. Nov. Holl. p. 9. Cox. mon. 1862 p. 95. Pl. xv. fig. 13 a.b.c.) *P. testa pyramidata (sæpe truncata), tenui, opaca, carneo-alba, intus rufo-fulva; anfractibus rotundatis, regulariter decrescentibus; spira obtusa; apertura ovata, crassiuscula, integra; labio interno ab anfractu ultimo disjuncto.*

Shell pyramidal, often truncate, thin, opaque, fleshy white, inside reddish brown, whorls (6) rounded, regularly decreasing, spire obtuse, aperture ovate, somewhat thickened, entire, inner lip distinct from the last whorl. Length 7, breadth 3 mill.

Habitat, Muddy and Clarence Plains, Rev. H. D. Atkinson. This shell was described as Blanfordia by Dr. Cox, as it was thought to be a land shell, but the Pomiatopsinæ are amphibious. This specimen is said to be found in South Australia, Victoria, and elsewhere. I believe I have found it in the interior of the continent in freshwater swamps in the Murray deserts, South Eastern district, &c.

ASSIMINEA. Leach.

(A synopsis of Moll. of G. Brit. Lond., 1820.)

Testa pyramidè-conica, solidiuscula umbilicata, umbilico parvo et ferè occulto; anfractibus lævigatis declivis convexis ad basim obtusè angulatis apertura integra, ad anfr. ultim. adherenti, columella tenuiter callosa. Operculum corneum.

Shell pyramidally conical, somewhat solid, umbilicate, umbilicus minute, small and nearly hidden, whorls smooth, sloping convex, obtusely angular at the base, aperture entire, adhering to the last whorl. Columella thinly callous. Operculum horny.

Assiminea was first discovered in the Bay of Naples and afterwards in Britain. Several allied forms occur in India and China. There is a globose form in Chili, and the genus appears to be represented by Amnicola in N. America. But as the determination of the genus rests more upon the structure of the animal than the shell, and as the new European species have not been examined, the identification must remain doubtful. For the information of observers who may pursue the subject, the following is the description of the animal. Body small; head produced into a ringed muzzle notched in front, *tentacles short, united with the eye pedicels and bearing the eye at the summit*, foot ample, broad in front, short and rather obtuse behind, carrying a slight horny, few whorled operculum.

1. ASSIMINEA TASMANICA *n.s. A testa turbinato-conica, parva, opaca, pallide viridi, intus fulva; epidermidé olivacea (sapè corròsà); spira acuta; anfractibus (5) planatis, apertura fulva.*

Shell turbinately conical, small, opaque, pale green, fulvous within with an olive epidermis (often corroded), spire acute, whorls (5) flattened, aperture, columella, and callosity fulvous. Length 4, breadth 2 mill.

Habitat, Sorell, a somewhat solid shell with much the habit of a small Littorina.

PLANORBIS. GUETTARD.

(De la Classification des Coq. Paris 1756.)

Testa discoidea, spira depressa vix priminula; anfractibus omnibus utrinque conspicuis, apertura oblonga, lunata, ab axe remotissima; margine numquam reflexo; operculum nullum.

Shell discoid, compressed, spire scarcely prominent, whorls all visible on both sides. Aperture oblong, remote from the axis, margin never reflected, no operculum.

Freshwater shells of world-wide distribution. The species also have a wide range. More than 100 are known and they are very abundant in America. The variations from the typical form are not numerous. There are two or three known in Australia but only one in Tasmania, and this appears to have escaped previous observers.

1. PLANORBIS TASMANICUS *n.s. P. discoidea, minuta, planata, tenuis, superne convexa, inferne umbilicata, confertim sinuato-striata, nitida, pellucida, pallide cornea, anfractibus (4—4½) convexis, ad basim dilatatis; sutura profunda; apertura ovata, obliqua; peristoma simplex sinuato. Diam. maj. 5, alt. 1, min. 3½ mil.*

Shell discoidal, minute, flattened, thin, convex above, umbilicate below, thickly sinuately striate, shining pellucid, pale horny; whorls 4 to $4\frac{1}{2}$, convex, dilated at the base, suture deep, aperture ovate, oblique, peristome simple, sinuated. Diam. 5., base $3\frac{1}{2}$, height 1 mill.

Habitat, still waters throughout the island.

PALUDESTRINA.

Under the head of this genus Mr. John Brazier, C.M.Z.S., has described the following species (See Proceedings of the Zoological Society of London, for the year 1871, page 696, "Descriptions of seven new species of Helix, and of two fluviatile shells from Tasmania, by John Brazier, C.M.Z.S.):—

PALUDESTRINA LEGRANDIANA.—Shell elongately conical, thin, semi-pellucid, greenish horn color, under a dark epidermis; whorls $6\frac{1}{2}$, somewhat flattened, the last three keeled between the suture, and furnished with small, solid, stunted hair-like spires, (as seen under the lens) of a bright, transparent horn color, flattened on the top; aperture ovate, margins continuous, thickened, outer lip reflected. Length $2\frac{1}{2}$ lines. Breadth $1\frac{1}{4}$ lines. Hab., Salmon Ponds, New Norfolk, Tasmania (Legrand.) This species is allied to Paludestrina Salleana, Fischer from Auckland, New Zealand.

PALUDESTRINA WISEMANIANA.—Shell elongately conical, thin, semi-diaphanous, epidermis light green; apex acute; whorls 6 to $6\frac{1}{2}$; convex smooth, grooved at the suture; aperture ovate; margins continuous, moderately thickened, columellar margin reflected, outer lip edged with green and reflected. Length 2 lines. Breadth 1 line. Hab., near Hobart Town, Tasmania, common in all creeks. Legrand and Petterd."

So far Mr. Brazier, but I must add that I have been unable to find either of the above shells nor anything resembling them in Mr. Legrand's extensive collections. I am unable to communicate with Mr. Brazier, as he has sailed for New Guinea in Mr. McLeay's expedition. I am obliged, therefore, to conclude that some mistake has occurred in transmitting the specimens. No such shells exist in Tasmania as far as at present known.

BIVALVES.

UNIO. PHILIPPSON.

UNIO MORETONICUS, Sow. *U. testa late oblonga, latere antico declivi-rotundato, postico oblique angulato, deinde oblique truncato; fusco nigricante.*

Shell broadly oblong, anterior side slopingly rounded, posterior obtusely angled, then obliquely truncated; fuscous black. Length 70, breadth 41, height 30 mill.

Tasmania, in the northern rivers, but not in the southern. The name has been applied under the idea that it is found in

Moreton Bay, Queensland, which is not the case. It appears that young specimens of *Unio cucumoides*, which occurs there very much resemble our species. This is probably the origin of the erroneous habitat in Reeve. It would be rather singular to find a Tasmanian species in a river on the Australian continent more than 1,400 miles away, and in no intermediate locality.

PISIDIUM. Pfeiffer.

(Systematische Anordnung und Beschreibung Deutscher Land und Wasserschnecken, &c., Cassel et Berlin 1821—28, 3 vols. 40.)

Testa tenuis æquivalvis, inæquilateralis, anticé producta, epidermide olivaceo-cornea induta, concentricé rugosa vel striata, intus albida, umbonibus prominentibus, tumidis, ligamentum subexternum, inconspicuum, latere minore insertum; dentibus cardinalibus minimis, in utrâque valva duobus divergentibus, in una valva binis, subdistantibus subelongatis; in altera quatuor duobus veré exiguis; impressionibus muscularibus duobus, lateralibus; impressione pallii sinu nullo.

Shell thin equivalve inequilateral, produced in front, covered with an olive epidermis, concentrically rugose or striate, whitish within, umbones prominent, tumid, ligament subexternal, inconspicuous, inserted in the shorter side, with two small hinge teeth in each valve, one of which is double in one valve, lateral teeth distant and somewhat elongate, muscular impressions two, with no pallial sinus.

This genus was separated from Cyclas on account of the difference of the siphonic tubes, and of the shells which in Pisidium are smaller, with the anterior side the longer, and the ligament on the shorter side.

They are found throughout Europe abundantly, but the foreign species are not well known, though India and New Zealand both possess species.

Pisidium tasmanicum, *n.s.* *P. testa orbiculato-ovata, tenuis, ventricosa, pellucida, albida, regulariter concentricé striata, inquilateralis, utrinque rotundata; latere antico subproducto, postico obtuse rotundato, umbonibus obtusis, ligamentum inconspicuum.*

Shell ovate, thin, ventricose, pellucid, whitish, regularly concentrically striate, inequilateral, or rounded on both sides; anterior side subproduced, posterior rounded obtusely, umbones obtuse, ligament inconspicuous. Length from 2 to 4; breadth $1\frac{1}{2}$ to $2\frac{1}{2}$; height 1 to 2 mill.

Habitat, Brown's River, Great Lake, Lake Dulverton, Dunrobin, and creeks near Hobarton. A small fragile shell in which the epidermis is not easily discovered. The specimens vary in size, and those from the Lakes are larger, a little more oblong, with shades of smoky horn, but I have never seen enough divergence of character to warrant the erection of more than one species.

Pisidium dulvertonensis, *n.s.*, *P. ovata, tenuis, ventricosa, rufo-fulva, nitida, regulariter concentrice striata; inequilateralis, latere antico producto, subangulato; postice obtuse rotundato et subangulato; umbonibus prominentibus.*

Shell ovate, thin, ventricose, fulvous-red, shining, regularly concentrically striate, inequilateral, anterior side produced, subangulate, posterior obtusely rounded and subangulate, umbones prominent. Length 7; breadth $5\frac{1}{2}$; height, $3\frac{1}{2}$ mill.

This remarkable species is much larger and different in color from the preceding. It is more angular in outline and more oblong. Like all the species from Lake Dulverton it is quite restricted in its habitat.

CYCLAS. Klein. (pars). 1753.

Testa ut supra (vide descript. Pisid. generis) ligamentum tamen latere majore insertum.

Shell as above in Pisidium, but the ligament is inserted in the longer side.

Cyclas tasmanica, *n.s.* *C. testa subquadrata, ventricosa, tenui, nitida, carneo-lutea, intus alba; eleganter striata; sulcis 3 vel 4 transversis, subcoloratis; umbonibus prominentibus sub-obliquis.*

Shell subquadrate, ventricose, thin, shining, fleshy yellow, white inside, elegantly striate, with 3 or 4 silver-like bands of colour which are lines of growth. Umbones prominent, sub-oblique. Length 9. Breadth $7\frac{1}{2}$. Height 5 mill.

Habitat, east coast, near Swansea. A very remarkable but somewhat small Cyclas, the only one known in Tasmania.

The following Valvata was found by Mr. Augustus Simson in a small trickling stream in Gould's Country, north-eastern Tasmania. It is the first Valvata known in the island, or in Australia.

VALVATA TASMANICA. *n.s. V.t. minuta, globosé turbinata, profunde lateque umbilicata, pallide cornea, epidermide atrato maculata, solidiuscula, semipellucida; anfractibus 4, rotundatis, tenuissime undulosé striatis, ad suturas subcanaliculatis; apertura semilunari, reflexa, postice angulata; labro medio producto, antice subeverso; labio recto tenui; umbilico marginato. Operculum corneum, ovale, spirale.*

Long. 1. Lat. 1, millimeter.

V. shell minute, globosely turbinate, deeply and widely umbilicate, pale horny, spotted with a blackish epidermis, rather solid, semipellucid, whorls 4, rounded, faintly undulately striate, subcanaliculate at the sutures; aperture semilunate, subreflexed, posteriorly angulate, outer lip produced in the middle, subeverted anteriorly, inner lip straight and thin, umbilicus margined. Operculum horny, oval, and subspiral.

SEPTEMBER, 1875.

The usual monthly meeting of the society was held on Monday, the 13th September. M. Allport, Esq., V.P., in the chair.

The following returns were brought under notice:—

1. Visitors to Museum during August, 1,253.
2. Ditto to Botanic Gardens, 3537.
3. Plants received at gardens:—From Captain Willet, 74 packets of imported seeds. From the Dolroyd Nursery Company, Sydney, 32 plants. From S. B. Heyne, Adelaide, 8 packets seeds. From Messrs. Shepherd and Co., Sydney, 60 plants.
4. Plants, etc., sent from gardens:—To the Botanic Gardens, Christchurch, New Zealand, 90 plants. To Dobroyd Nursery, Sydney, 32 plants. To Botanic Gardens, Adelaide, 100 packets seeds. For the grounds of St. David's Cathedral, 114 plants.
5. Time of leafiing, etc., of a few standard plants in Botanic Gardens during August.
6. Books and periodicals received.
7. Presentations to Museum and Library.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq.—Table for August.
2. Port Arthur, from J. Coverdale, Esq.—Ditto July.
3. From the Marine Board.—Mount Nelson table for August; Swan Island ditto for June and July.
4. From the Government Observer, Melbourne.—Table for March.
5. From ditto, Sydney.—Tables for May and June.

The presentations to the Museum and Library were as follows:—

1. From P. T. Smith, Esq.—A Musk Duck *(Biziura lobata)*, shot at Cleveland.
2. From Mr. E. P. Cotton, Swansea.—A young Tippet Grebe *(Podiceps Australis)*.
3. From Mr. John Crawford.—Specimen of Flax from the Huon, grown and prepared by the donor.
4. From C. E. Hogg, Esq.—Specimen of the paper-like bark of a species of *Melaleuca*, from Lake Hindmarsh, Victoria.
5. From Mr. W. E. Baynton, Kingston.—A collection of the stone implements of Tasmanian Aborigines from that district.
6. From Mr. S. H. Wintle.—Specimen of Bismuth from Mount Ramsay; tin bearing wash dirt and porphyry, cassiterite on sandstone, etc., from George's Bay. Skin of an echidna.
7. A Japanese bronze coin, value about one penny, and a note value 10 cents.
8. From Mr. W. Parker, Lewisham.—A curious growth, known as "arching" of branch of gum tree.
9. From Mr. E. Gard, Sorell.—A Ferret.
10. From G. Bennett, Esq., M.D., F.L.S., F.Z.S., Sydney.—A large collection of bones of fossil mammals from Gowrie Creek, Darling Downs, Queensland, viz.:—Fossil Kangaroo—16 Vertebræ; 7 fragments of Pelvis; 5 ditto Tibia; 1 ditto Radius; 2 ditto Humerus; 1 ditto Scapula; 2 bones of Foot; 1 fragment of Femur; 2 ditto of Jaw; 1 bone of Sternum; 5 Ribs. Fossil Wombat—1 Upper Jaw; 2 Vertebræ; 1 Radius. Diprotodon—Portion of Skull; Lower Jaw; 9 Vertebræ; 4 fragments of Pelvis; 10 Ribs; 1 Humerus; 1 fragment of Tusk. Nototherium—1 Jaw.
11. From T. Stephens, Esq.—Three specimens from the prospecting shaft, Spring Bay. In reference to this presentation the following remarks by the donor were read:—

["These specimens have been kindly furnished by the Hon. C. Meredith. The coal, which was struck at a depth of about 120 feet, is a slaty anthracite, containing some calcite, like the Jerusalem coal, and a little sulphur. It is of no value, owing to the thinness of the seam—8 or 9 inches. The specimen of shale (No. 3) was met with at about 140 feet. It contains numerous vegetable impressions, but they are so much confused and obliterated that I can only identify a fragment of *Pecopteris Australis.* So far as the evidence goes, there is nothing to discourage the promoters of this enterprise; but if they do not strike what is known as the 5ft. seam, at a depth of 180 to 200 feet, the inference will be that they are too low down in the series, and they should look out for a locality in which there has been less denudation of its upper members."]

Presentations to the Library—

1. From Dr. Agnew.—Journal of the Archeological Society of Ireland, Nos. 13 to 19, and part 4 (plates).
2. From the author, Baron F. von Mueller, on the part of the Government of Victoria—"Fragmenta phytographiæ Australiæ, vol. 8.
3. From the Government of New Zealand.—"Transactions of the New Zealand Institute," vol. 7.
4. From the author, J. Wood Beilby, Melbourne.—A pamphlet on mining for gold and coal.
5. From the Royal University of Norway.—Sundry publications on Geology, Entomology, Egyptian inscriptions, etc.

J. R. Scott, Esq., M L.C., read an account of a visit made by him to Port Davey in March last. This exceedingly interesting paper was listened to with marked attention. It was illustrated by sketches of the local scenery, the "piners" huts or "Badger Boxes," etc., and also by a large and very well executed chart of Port Davey and the surrounding country, drawn by Mr. Scott himself, partly from personal survey, and in part from the Government map of the country.

The Rev. Julian Woods drew attention to some remarks made by him at the previous meeting with reference to certain flint implements, and the antiquity of cave remains. What he intended to convey was not so much his own opinion as that of eminent geologists, whose conclusions on these subjects had undergone considerable modification of late years. He was only citing the observations of Prof. Prestwich in his inaugural address on assuming the professorship of geology at Oxford on the 29th of January of this year; in which, referring to the theories of other geologists, and to the philosophy of Hutton, Playfair, and their successors, Mr. Prestwich said it is a question whether the license which was formerly taken with energy is not now taken with time. The points at issue are, first, whether our experience on these questions is sufficient to enable us to reason from analogy; and secondly, whether all changes on the earth's surface are to be explained by the agency of forces alike in kind and degree with those now in action. Mr. Prestwich then states his reasons for answering these questions in the negative. He (Mr. Woods) merely drew attention to the fact of a race using flint implements having become extinct within the last 60 years as a case in point.

Mr. Rule took occasion to remark with regard to the cave at Brixham, mentioned last month, as one of the evidences of the great antiquity of man, that the stalagmite forming the floor was only one foot thick, not many feet, as the published report represented him to have said. He added that the thickness of the floor was not the only indication of the remote period when the cave-dwellers lived, for underneath was a bed of loam fifteen feet deep, beneath that a bed of gravel deeper still, and some of the flint implements were found at the bottom of all. Moreover, the cave was on a hill side, a hundred feet higher than the present beds of the neighbouring streams, which, since the water deposits in question, appear to have worn down their beds to that extent. This process (the formation of ravines by running water) must, under ordinary circumstances, occupy an enormous period of time.

After some further conversation on the subject, in which the Chairman and Messrs. Grant and Woods took part, Mr. Barnard moved that the cordial thanks of the meeting be given to Mr. Scott for his highly interesting paper. He would also include a special vote of thanks to Dr. Bennett for the large and valuable selection of Queensland fossils, with which he had enriched the museum.

The motion was carried by acclamation, and the meeting closed with the usual acknowledgement to the other donors of presentations.

OCTOBER, 1875.

The monthly evening meeting was held on the 12th October, the Lord Bishop of Tasmania in the chair.

A. B. Crowther, Esq., who had previously been nominated by the council, was, after a ballot, declared duly elected as a Fellow of the Society.

The Secretary brought under notice the usual returns for the past month, viz. :--

1. Number of visitors to Museum, 1,194.
2. Ditto to Gardens, 3,532.
3. Time of leafing, flowering, etc., of a few standard plants in Botanic Gardens during September.
4. Plants received at Botanic Gardens.
5. Books and periodicals received.
6. Presentations to Museum and Library.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table for September.
2. New Norfolk, from W. E. Shoobridge, Esq., ditto.
3. Mount Nelson, from Marine Board, ditto.
4. Swan Island, from ditto, table for August.
5. Port Arthur, from J. Coverdale, Esq., ditto.

The presentations were as follow :—

1. From Mr. King—A large Tiger Cat *(Dasyurus maculatus.)*
2. From Mr. J. G. Lindsay—Specimen of Lewin's Water Rail *(Rallus brachipus)*, caught in a garden at Launceston.
3. From Mr. R. B. Dyer—A Fish washed on shore at Battery Point.

With reference to this presentation Mr. ALLPORT said it was known as the "Frost Fish" *(Lepidotus caudatus)* in New Zealand, and derived its trivial name from the fact that numbers were frequently found on some of the beaches after a frosty night. It is said to be the best edible fish of New Zealand, being seldom sold at less than 2s. 6d. per lb. The specimen is the first recorded as found in this colony. [For description of the "Frost Fish" see "Catalogue of Fishes of New Zealand," by F. W. Hutton, F.G.S., pages 13 and 109, plate 3, fig. 19.]

4. From Mr. G. Peacock, Sorell—An albino variety of the common Pipit Lark *(Anthus Australis)*.
5. From Justin Browne, Esq.—A sample of virgin Olive Oil from a plantation at Adelaide.

[The great purity of this oil, and its freedom from any disagreeable taste or odour, were noticed by several of the members.]

Donations to Library :—

1. From the Royal University of Norway—"Contributions to Fauna of Norway," "On Giants' Caldrons," "On Egyptian Inscriptions," "List of Norwegian Insects."
2. From the Meteorological Department, India—Bengal Meteorological Reports, 1867 to 1874 ; ditto Administration ditto, 1870 to 1875 ; Report of Midnapore and Burdwan cyclone.
3. From His Highness the Maharajah of Travancore—"Magnetic Observations taken at Trevandrum and Augustia Malley Observatory," Vol. I., 4to.
4. From the Hon. J. Whyte, Esq., M.L.C.—A copy of Governor Collins's "History of the Colony of New South Wales, from its first settlement in January, 1788, to August, 1801," published in 1804, one vol. 4to.

The SECRETARY observed that presentations of this nature were most acceptable. Books of every kind bearing on the earlier history of this or of the neighbouring colonies were much wanted, and as the Society was quite unable to procure them by purchase the liberality of such members as could present them would always be very gratefully acknowledged.

Attention having been called to the Herbarium recently arranged by the Rev. W. W. Spicer, of New Town, the following letter to the Secretary, from Mr. Spicer, was read :—

"Jutland, New Town,
"Oct. 9th, 1875.

"DEAR SIR,—Some months ago I undertook to arrange and classify the collection of dried plants presented to the Royal Society by Dr. J. Milligan. My task being completed I now return the collection to the Museum. I found the specimens to be well preserved as regards freedom from mould and the ravages of insects ; but they were in a state of thorough disorder, the species being in many cases mingled together, and no care having been taken to keep them under their respective natural orders.

"The collection consists of 468 species and varieties, comprised in 244 genera and 69 orders (a small proportion this of the whole of our native Flora, which, as at present known, contains nearly 1000 species, ranged under about 420 genera and 93 orders), but the plants included in it have a special value, having had the advantage of passing under the inspection of Baron von Mueller, and many of them, I believe, having served as types to Hooker and Bentham, in working out the Flora of Tasmania and the Flora Australiensis. I should on this account propose that this collection of our indigenous plants, though small, be kept separate from all others ; any future additions being made supplementary to it. I hope myself to add a good many before the end of the summer . . . . . But why should not an appeal be made to all who are interested in biological investigations to contribute to the Society what they can spare from their private collections? Many, no doubt, would be glad to do so, for the sake of the scientific purposes involved, were their attention drawn to the subject. There are two or three botanists of note in the north of the island. A gentleman in Hobart Town has offered me a number of dried plants which have been for a long period in his house, and are of no service to him. I mention this circumstance as leading one to hope that other collections now hidden away in dusty closets might be brought to light, if it was known that the presentation of them to the Society would be acceptable. And if it was thought expedient to extend the appeal beyond the limits of Tasmania, I should imagine that Melbourne, Sydney, and New Zealand would be willing to aid us in forming a Herbarium more worthy of a Royal Society than the one we at present possess. Such an appeal, moreover, might be made to embrace other objects generally included in the desiderata of a Museum.

"In arranging Dr. Milligan's plants I have followed the scheme employed by Baron von Mueller in his "Census of the Plants of Tasmania, 1875 ;" and to a great extent, though not entirely, I have adopted his nomenclature. I have also placed within the upper cover of each fascicle that portion of the Census which relates to the orders contained in it, marking with a cross the species to be found therein, so that the student may ascertain at a glance the presence or absence of the plant he is in search of. I have been careful also to preserve the labels and other notes which I found in the original sheets. It has happened occasionally that the name I have bestowed differs from that given at first ; in such cases I have thought it better to leave the original title intact, and then future botanists can determine which is the more correct.

"With regard to the remaining botanical specimens in the museum, Mr. Roblin has brought them together, and I have given them a cursory examination. Speaking roughly the different collections (of which there are nearly thirty) amount to about 2000 species, of which some 1200 to

1500 are worth preserving. Many of these are valuable, while of others it may be said, the wonder is they ever found a lodging here at all! Not a few again, though well preserved have lost much of their value from the fact of their localities and other 'indicia' not having been preserved. · · · · · Taken as a whole I think that the following may probably be made available, viz.: 200 Tasmanian, 300 Australian, and 900 European.

"If the Society cares to have them arranged I shall be very happy to take the collections in hand, and to put them in what order I can.

"I remain, etc. etc.,

"W. W. SPICER."

The SECRETARY remarked that the letter had already been read before the Council, and the Council, fully recognising the great importance of the work done, had requested him to convey to Mr. Spicer their warmest thanks for his valuable services, and further to say that they most gladly accepted his very kind offer to classify and arrange the remaining plants in the museum. (General applause.)

The Rev. JULIAN WOODS observed that Mr. Spicer, whose reputation as a botanist required no comment, had laid the Society under a great obligation. The Society was now fortunate in having such a Herbarium, as it could be truly called a type collection—such a collection indeed as no other colonial society with which he was acquainted, possessed. He thought the suggestion thrown out as to an appeal for contributions of various kinds might be acted upon with great hopes of success. On former occasions he had spoken of the richness of the library in scientific works. There were some works however which might be advantageously exchanged. He had noticed in the Public Library a work which might thus perhaps be acquired, and which, though comparatively valueless where it is, would be an acquisition to our library. He referred to De Candolle's Prodromus.

The SECRETARY mentioned that his attention had been called to a paragraph in a recent Edinburgh paper which he thought was of sufficient interest to be brought before the Society as it referred to the apparently successful growth of the Blue Gum and other Australian trees as far North as the Isle of Arran, in the Frith of Clyde. Mr. Grant had suggested that the circumstances of the gum flourishing in such a latitude might be owing the local influence of the Gulf Stream. The writer says:—"This winter has been sufficiently severe, and having visited Arran this week I give you the result. The Blue Gum *(Eucalyptus globulus)* unhurt, but the leaves a good deal browned; two varieties of the Weeping gum unhurt, but the points of the twigs slightly nipped; the Beef Wood *(Casuarina equisetifolia)* a good deal nipped; *Acacia dealbata*, untouched; *Acacia melanoxylon*, slightly browned; *Accacia stricta*, slightly nipped; the great Australian bush fern *(Dicksonia antarctica)* untouched; the silvered Tree Fern of New Zealand untouched; the fine Australian Palm *(Corypha Australis)*, which grows in its native country to the height of fifty feet, untouched; a fine Myrtle *(Myrtus communis)* ten feet in height, untouched. Almost all these plants are standards. None of them had any protection save a few fern leaves around their roots."

E. C. NOWELL, Esq., the Government Statistician, read an elaborate and carefully prepared paper "On the Vital Statistics of Tasmania, with especial reference to the Mortality of Children."

The BISHOP expressed the great gratification with which he had listened to Mr. Nowell's paper. As a member of the Statistical Society of London, and a former secretary to the statistical section at one of the meetings of the British Association, he took great interest in statistics in general; but the subject of the present paper was one which must be of importance to the community at large. His Lordship proceeded to comment upon several portions of the paper, especially in reference to the comparative number of children to adults in Tasmania, and in the other colonies, etc. The writings of Dr. Hall, and papers such as that before the meeting, might have very important results, as the question of making Hobart Town the naval station of the colonies may rest upon the proofs which we can give as to the salubrity of our climate.

Mr. STEPHENS doubted if, in the matter of the public health, 1875 was a desirable year for statistical purposes. He had never known so unhealthy a year throughout the island. Epidemics of various kinds were continually occurring in different localities. Possibly they might, to some extent, have been influenced by local circumstances, but the state of the weather, whether wet or dry, did not appear to have any influence, either in promoting their occurrence or otherwise.

Mr. NOWELL had no doubt that local circumstances exercised great influence, and mentioned instances within his knowledge in which two cases of diphtheria had occurred in a family from imperfect drainage, and the health of the father had also suffered from the same cause.

Dr. AGNEW knew the cases referred to by Mr. Nowell, and these were certainly not due to imperfect drainage. The father too had suffered from a mere local affection which could not have been induced by imperfect drainage. He had, however, been informed by Dr. Butler that the outbreak of diphtheria at Brighton was undoubtedly due to local causes. There, a great number of the inhabitants took their drinking water from a pool of the River Jordan (which was then not running) into which the drainage of many of the houses found its way from the high banks in the immediate vicinity; with this drainage of course human excreta and various other impurities were mixed.

Mr. BARNARD had listened with great pleasure to the paper, but expressed the difficulty which he in common with every one must feel in commenting upon papers which dealt so largely with figures. He suggested that papers of this kind should be printed and circulated among the members before being read. By this means only could a proper discussion be obtained, as it was impossible when masses of figures were in question to deal with them without previous study. As to the death rate of the colony, it was worth noting that the very salubrity of our climate might affect it unfavourably, because many invalids, attracted by this very salubrity, come here in the last stage of illness, and thus the deaths were increased, although it was evident that the climate was not in fault. He thought that good use might be made of the paper by the Immigration Board if they would disseminate in proper quarters the valuable information it contained. It might assist in determining the selection of this port as a naval station, which was a matter of considerable importance, as the presence of ships of war would probably lead to the local expenditure of about a hundred thousand pounds annually.

Mr. RULE would only make one remark in reference to a point which had been casually alluded to during the discussion, viz., the establishment at Hobart Town of the naval station. No doubt in a pecuniary point of view this would be very beneficial, but he feared that morally speaking it would be anything but an advantage.

The Rev. JULIAN E. T. WOODS read a paper by F. M. Bailey, Esq., of Brisbane, a corresponding member of the society, "On the Queensland Grasses."

The BISHOP observed it was interesting to note that so many of our Tasmanian grasses were found in Queensland. The opinion of so competent an authority as the writer as to the great nutritive value of many of the

Queensland grasses might, perhaps, be acted on, and lead to the introduction of some of them to our own pastures. The fact of these grasses growing side by side in Queensland, would argue that they would do equally well in Tasmania. Some of those with very deep roots might be valuable as feed in summer time, when the shallow-rooted species were burned up and destroyed by the heat.

Mr. M. Allport, in moving the usual vote of thanks for the papers and presentations, said that after the remarks of his Lordship, he (the mover) need not impress upon the meeting the value of the papers read, or the desirability of publishing them. But with regard to the presentations to the Museum, one called for special mention ; namely, the presentation of time and skill by the Rev. W. W. Spicer, expended in the arranging our heretofore neglected botanical specimens. The society has been most fortunate in securing the services of Mr. Spicer in this direction ; while the Rev. J. E. Tenison Woods has been devoting himself to our fossils and shells ; thus rendering these collections of real service to those who wish to learn anything of our indigenous productions. The meeting should also remember, while thanking Mr. Bailey for his paper on Queensland Grasses, that the Society is in this case also indirectly indebted to Mr. Woods, as but for him the writer would not have been numbered amongst the corresponding members.

The vote having been passed, Mr. Nowell and the Rev. J. E. T. Woods returned thanks, the latter suggesting that in the future published lists of the Fellows, asterisks should be placed before the names of those who had furnished papers to the Society.

The suggestion was adopted by the meeting, and the proceedings then terminated.

NOVEMBER, 1875.

The monthly evening meeting of the Society was held on Monday, the 8th November, His Excellency the GOVERNOR in the chair.

Captain Langdon, R.N., and Mr. Richard Crosby, who had been previously nominated by the Council, were balloted for, and declared duly elected as Fellows of the Society.

The following returns were brought under notice :—

1. Visitors to Museum during October, 1,471.
2. Visitors to Botanic Gardens during October, 3,620.
3. Time of leafing, etc., of a few standard plants in Botanic Gardens during October.
4. Books and periodicals received.
5. Presentations to Museum and Library.

Meteorological Returns :

1. Hobart Town, from F. Abbott, Esq.—Table for October.
2. Port Arthur, from J. Coverdale, Esq.—Table for September.
3. New Norfolk, from W. E. Shoobridge, Esq.—Table for October.
4. Mount Nelson, from the Marine Board—Table for October.
5. Goose Island, from the Marine Board—Tables for August and September.
6. King's Island, from the Marine Board.—Tables for July, August, and September.
7. Kent's Group, from the Marine Board—Table for September.
8. Sydney, from the Government Observer—Printed abstracts of observations made in New South Wales, July, 1875.
9. Melbourne, from the Government Observer—Printed abstracts of observation for May.

The presentations to the Museum and Library were as follows :—

1. From the Rev. J. E. Tenison Woods—A collection of Queensland ferns, named.
2. From A. Simpson, Esq.—5 samples of Tin Ore from Georges' Bay.
3. From the Japanese Commissioners to Melbourne Exhibition—Transverse and longitudinal selections of Japanese Woods, with native and scientific names, mounted in book form—12 packets of seeds from Japan.
4. From Justin Browne, Esq.—A collection of Tasmanian copper tokens.
5. From Mr. C. Anderson—A young snake, probably *Hoplocephalus superbus.*
6. From the Rev. Thos. Reibey, M.H.A.—A Bronze Medal of Captain Cook, date 1772, left on one of the Society Islands and brought home many years ago by Captain Thomas Reibey, sen., of the brig "Mercury."
7. From Mr. Furgusson, Tinder Box Bay—Two Egg cases of a Ray.
8. From Mr. Banning, East Bay Neck—A very large Egg of domestic fowl. This egg measures 8½ inches at its greatest, and 7¼ inches at its least circumference, and has another egg within it. The donor also sent a duck's egg remarkable for its unusually small size.
9. From M. Allport, Esq—A young Diamond Snake *(Hoplocephalus superbus).*
10. From Mr. J. Brock, Campania—Two specimens of fossil wood.
11. From the Hon. J. R. Scott, Esq., M.L.C.—Sample of coal picked up on Pebbly Beach, Port Davey. (See Mr. Scott's paper on Port Davey, read at September meeting.)
12. From Mr. Stump—A silver coin, ⅛ dollar, Mauritius 1820.
13. From J. Swan, Esq.—Two specimens of Native Bread *(Mylitta Australis).*

Presentations to Library.—From the Magnetic and Meteorological Observatories, Toronto, Canada, "Reports for 1874," "Abstracts and results of observations 1841 to 1874." From the Meteorological Office, London, "Quarterly Weather Report, part 3, 1873," "Instructions in use of Meteorological Instruments, 1875." From Academy of Natural Sciences, Philadelphia, "Proceedings 1874, parts 1, 2, and 3." From the Rev. W. B. Clarke, M.A., F.G.S., etc., "Remarks on the Sedimentary Formations of New South Wales," and the "Address to the Royal Society of New South Wales, 1875," by the donor. From the Exhibition Commissioners, Melbourne, the "Official Catalogue of the Intercolonial Exhibition, 1875, 3rd edition."

Mr. M. Allport, in the absence of the hon. secretary, called attention to the beautiful series of lithographs of the tertiary fossils from the north coast of Tasmania, executed by Mrs. Meredith from her own original drawings, and pointed out that the value of the Rev. Julian Woods' paper on these fossils was materially enhanced by the skilful work of the talented artist.

The Rev. J. E. Tenison Woods in introducing his paper "On some new and hitherto undescribed Shells of Tasmania," remarked that his list though a large one for novelties, where so much had been done, might require considerable augmentation. He had only dealt with the univalves so far, and could hardly say even that he had thoroughly examined all these. Some short time ago Mr. Legrand of Elizabeth-street, had invited him to make a critical list of all the Australian Mollusca, offering for the purpose to place at his disposal, his collection, which certainly was one of the largest, if not the largest in the colonies. Such a list for all Australia, though a great desideratum, was far beyond the limits of the time which he (Mr. Tenison Woods) could give to it. He had offered, however, to make such a list for Tasmania only, that is :—1st. To establish the nomenclature of such species as were described, and give leading references to the works containing them. 2nd. To give briefly the characters of all the shells. 3rd. To describe for scientific purposes such as were new. The first result of this enquiry had been a monograph on the Freshwater Mollusca which would appear in that year's Transactions of the Society. After about three months' labour he had gone through the collections of Mr. Legrand, besides small collections of Mr. Justin Browne, Mr. Stephens and others, and the present list of over 70 univalves new to science was the first result of the examination. He did not doubt that the number would yet be increased, and therefore he would request the Council of the Society not to print the present paper in the Transactions of the current year, not only that he might have an opportunity of making it more complete, but in order that it might appear side by side with the complete catalogue which he hoped to have ready for the March meeting. He asked permission of His Excellency and the members to express at the same time his many obligations to Mr. Legrand in preparing the list, not only because that indefatigable collector had placed his specimens at his disposal, but also because he had spared no pains in the examination of references, besides bringing his own valuable experience and local knowledge to bear on the matter. He thought that Mr. Legrand should justly share with him whatever credit there was due for their scientific inquiries. Mr. Woods then went on to point out what had been done for Australian conchology, and passed in review the labours of Linneus, Lamarck, Quoy, Gaimard, Deshayes, Crosse, G. Angas, Dr. Cox, and A. Adams. He showed that though no separate list of Tasmanian Mollusca had been published, yet Mr. G. F. Angas's list for South Australia, and the far more elaborate list for S.E. Australia in the Zoological Proceedings for 1865 and 1867 respectively, had materially lightened the labours of any naturalist for Tasmania. He then described the boundaries and peculiarities of the so-called Australian molluscous province, and showed how it might be divided into sub-provinces which would be nearly conterminous with the colonies of South Australia, Victoria, New South Wales, and Tasmania. He particularised the characters of the Tasmanian sub-province, and showed how it might be sub-divided into the northern part of the island and the islands in Bass' Straits, which was of a Victorian character, and the South Tasmanian which was peculiar with a very large admixture of East Australian, and a small influence of New Zealand shells. Mr. Woods further described the features of the new shells brought thus under notice, which were for the most part small, but nevertheless yielding many new *Mitræ* and novelties as *Patella*, *Diala*, *Alaba*, *Turbonilla*, *Purpura*, *Cominella*, *Drillia*, *Mangelia*, *Siphonalia*, etc. He expressly called attention to a new species of *Crossea*, the fourth known, two others being from Japan and one from Port Jackson. Mr. Woods explained that he had written his paper both in Latin and English. He regretted the space thus taken up, but it had been generally established that new investigations of a purely scientific character, should, in order to their universal reception, be published in Latin, to be thus accessible to scientific men of every nation. As however a Latin description might not be so accessible to investigation in Tasmania he had given the paper in both languages, thus hoping to make the publications of the Royal Society as useful to their fellow colonists as to the world. He trusted that the paper would be one of many which would tend to make the Royal Society as valuable an institution as that of any colony; and if any credit redounded to him for his labours he was glad to think it would be largely shared by the members who had so willingly co-operated with him in them.

Mr. M. ALLPORT moved the usual vote of thanks to the donors of the various presentations, and especially to the Rev. J. E. Tenison Woods for his valuable paper on the Marine Shells, and for the highly interesting remarks with which the same was accompanied. Also to Mr. Legrand, without whose services the work would scarcely have been possible, Mr. Woods having already explained how greatly he was indebted to Mr. Legrand for the loan of specimens, and for copious information as to localities, etc.—information which no other man in Tasmania could have afforded.

The vote having been carried *nem. con.*, the Rev. JULIAN WOODS moved that the special thanks of the Society be conveyed to Dr. J. Cox, of Sydney, for the loan of a valuable type collection of Australian Marine shells, and alluded to the difficulty of obtaining such a favour from most scientific collectors.

The motion was unanimously agreed to, and the meeting terminated.

PORT DAVEY IN 1875.

By the Hon. James Reid Scott, M.L.C.

[Read 13th September, 1875.]

At the present time Port Davey supplies Hobart Town with the great bulk of the timber known as "Huon Pine" [*Dacrydium Franklinii*], and has done so for several years back. That port may indeed be said to be the chief seat of the pine-getting industry in Tasmania, Macquarie Harbour being deserted, and the Pieman, Picton, and Craycroft, worked to a very limited extent, if at all. The pines obtained on the Forth and Dove Rivers are, I believe, of a different species [*Athrotaxis selaginoides*] called "pencil pine," or "King William Pine." From the nature of the Port Davey district, the beds of timber are necessarily of limited extent; and although occasional supplies have been obtained for more than 50 years, and a steady industry has been continuously prosecuted there for the last 25 years, still circumstances (such as a rise in prices, and consequent influx of piners) might extinguish the trade for a time, until young trees grow up to a size fit for market. I do not apprehend any such result, but I hope that a few personal observations on the locality, its pine industry and forests, etc., during a recent visit, will be interesting, even to those who fully know and appreciate the details and hardships of the occupation of a piner.

In March last I paid a visit to Port Davey for a second time, having been there about four years previously with Mr. Piguenit, who took some very characteristic sketches of the scenery. Though my main object this time was to have some hunting and fishing, I took the opportunity of going to the actual workings in the pine-forests, the present scenes of labour; and I saw much new to my personal experience, although not altogether unknown to me by report. I therefore make no apology for presenting to your notice the following account of my trip.

On my former visit my party went and returned by land, along the naturally defined series of valleys and "saddles" or passes, mainly clear of forest, up the course of the Huon, down that of Spring River, and across the Berry Head Range—an unmistakable route to anyone with knowledge of the localities, though not without its difficulties in travelling. The road from Victoria to the Craycroft is so overgrown and blocked up, that the journey from Hobart Town to Port Davey by that route could not well be made now under four days, and I would not advise a stranger to attempt it at all. On the second occasion I went and returned by water, going down with Captain Lloyd in the "Swansea Packet," and coming back with Captain Dominey in the "Ripple," both regular traders.

The inhabitants were little changed during the four years which had elapsed. I found the well-remembered faces, and received the same cordial welcome and hospitality as before. Similar packs of half-starved dogs lifted up their voices, and would have stolen anything eatable left within their reach. The children had, of course, grown up beyond recognition; and an old resident, Mr. Bennett, had returned, and was busy building a good-sized barge. Doherty, the oldest inhabitant, who has been there ever since 1849, placed a hut at Observatory Point at my disposal, and Captain Lloyd lent me a good whaleboat.

Besides those at Port Davey settlement, numbering about 50, there is an isolated establishment at Spring River, where Mr. Page was at work, but he was unfortunately hampered in his proceedings by a sad accident which befell his mate George Baker. When upon a scaffold to fell a tree, Baker lost his balance, and his foot caught in one of the props, which caused him to swing and fall heavily against the butt of the tree, dislocating his left shoulder. There was no opportunity for nearly a month after this to get him to town for medical assistance, the shoulder remaining "out" all the time. Dr. Crowther was applied to, but Baker had to go to the Hospital for the operation of setting. Since then (owing possibly to the prior delay) the whole arm has been powerless, and is gradually withering and decaying, extending upwards from the fingers. The poor fellow's days of active labour seemed at an end—the more to be deplored because he was a very steady industrious man, with a wife dependent upon his exertions.

The houses at Bramble Cove were all unoccupied.

My anticipations of good sport were not fully realised in consequence of the weather. Continual storms, with a low barometer, entirely precluded trumpeter fishing (for which one has to go outside the Heads), and made boating generally attended with more risk than pleasure. I visited Kelly's Basin and the West Coast beyond it; went up Bathurst Harbour and New Harbour Creek nearly to Cox's Bight; and up the Davey River to the plains known as Longley's Ground and The Rookery. Kangaroo, wallaby, wombat, ducks, and swans were abundant; some of the latter were then "moulters," and we could pull them down with the boat. The greatest treat, now as formerly, was the plentiful supply of oysters, Kelly's Basin containing the largest and most easily obtained rock-oysters I have seen, and they were in prime condition. Mounds of empty shells at various parts of the beach gave proof that the aborigines had also appreciated them in days gone by. While speaking of game, I must mention a fact respecting the wombat which coincides with my own experience and the opinion of many bush travellers. In the year 1866 the Port Davey settlers were, owing to heavy gales, for some months without supplies of flour and provisions, so that they were compelled to live on "wild" meat alone, and most of them took to hunting during that time. Their unanimous verdict is that they very soon got tired of kangaroo or swan's flesh, but could subsist on wombat without dislike; also that a meal of the latter had far more nutritive power than kangaroo.

It is almost impossible to describe the country round Port Davey to one accustomed only to the settled portions of Tasmania, while the grand scenery such as Hell's Gates, must be seen to be realised. Written landscapes leave no picture in the mind of a stranger. The greater portion of the country is open, consisting of broken ground or large flat plains between steep and lofty ranges, covered with button grass and intersected by belts of timber of various shapes and sizes; the timber is generally along the banks of streams, or in gullies on the mountain sides, though some of the ranges are entirely wooded. The hills are steep and rugged, and show their white quartzite rocks bare at the top, which gives many the appearance of being snow-clad, and throughout the day they are ever assuming new forms and colours as the sunlight strikes them at a different angle. Thus the country is most picturesquely diversified by white rocky ranges, warm-coloured plains and sombre forests; and in fine weather looks both wild and beautiful. The plains are made gay by many flowering plants, conspicuous among which is the *Blandfordia* with its crimson and yellow spikes of flowers, growing in every situation from the margins of creeks to the crevices of rocks on mountain summits. Like all Western Tasmania, as the open ground gives one the impression of desolation and barrenness, so on entering a forest the opposite extreme of rank vegetation is immediately encountered. Underneath there is generally a tall and tangled growth of wireweed *(Bauera)* and cutting-grass, with horizontal scrub *(Anodopetalum)*, Laurel *(Anopterus)* Native plum (*Cenarrhenes*) and all those shrubs most conspicuous in our western forests; pinkwood, hickory, and teatree attain a large size, gums and myrtles *(Fagus)* being the lofty trees. These forests are enlivened by the climbers *Billardiera* and *Prionotes*, which often form festoons from tree to tree. *Richea pandanifolia* is frequently met with.

The pines have a peculiar limitation in their distribution worthy of remark; growing on the margins of small streams or in the alluvial flats along the rivers, they seem to be derived only from the west or south-west sides of the ranges. The leading mountain chains run nearly parallel with the coast, about N.N.W., and no pines are found along the streams running from their eastern slopes. In like manner, when the Davey is divided into two branches, about sixteen miles up, the western branch is called the Hardwood River, because no pines have been found along its course. The other branch which is fed from the south-west slopes of the Frankland Range, is well supplied, and from it the great bulk of the timber is now being procured. Again, the range from which the Hardwood River derives most of its tributaries, is pine-clad on its south-western slopes, the streams from which run into the sea near Rocky Point. In Spring River the same feature is observed, and also in the originally named "Spring River" at the extreme eastern end of Bathurst Harbour; and I have no doubt from the formation of the country and my knowledge of the Arthur and Huon Plains, that the Craycroft presents the same peculiarity. Of the Picton, Gordon, Franklin, and Pieman I do not know enough to hazard an opinion.

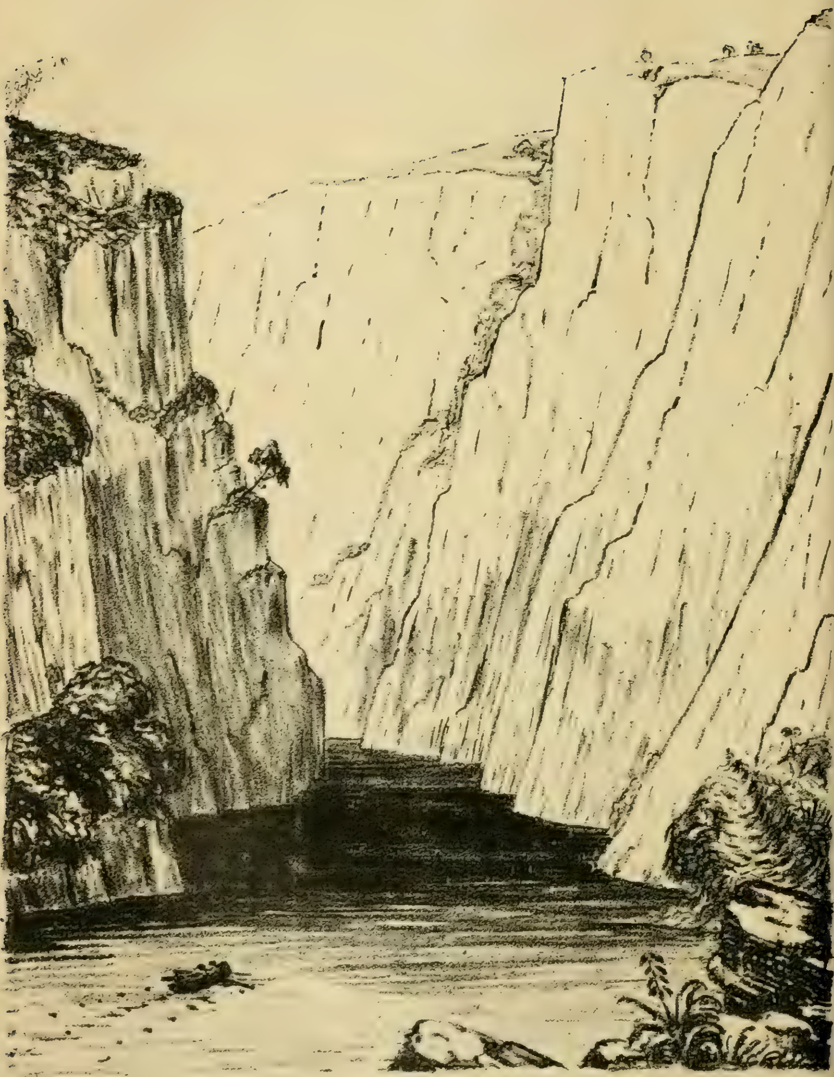
At the highest point I visited up the Davey River, where Doherty is at work, are some King William Pines (*Athrotaxis selaginoides*) whose wood is much more open-grained than Huon pine, and of a red colour. I have no doubt that towards the Frankland Range they will be found in great numbers.

The pine is not met with near the margin of the salt water, though one spot was pointed out to me on the bank of the tidal portion of the Davey, about half way between the Settlement and Hell's Gates, which had been a thicket of small pine trees of several acres in extent, not observed until a large fire swept through and killed them. Some distance up the Crossing River there is an untouched bed of pines, but below it the steep banks of the river have fallen in and blocked up all passage for floating the logs down, affording complete protection to that bed of timber, unless a short tramway is made to surmount the obstacle.

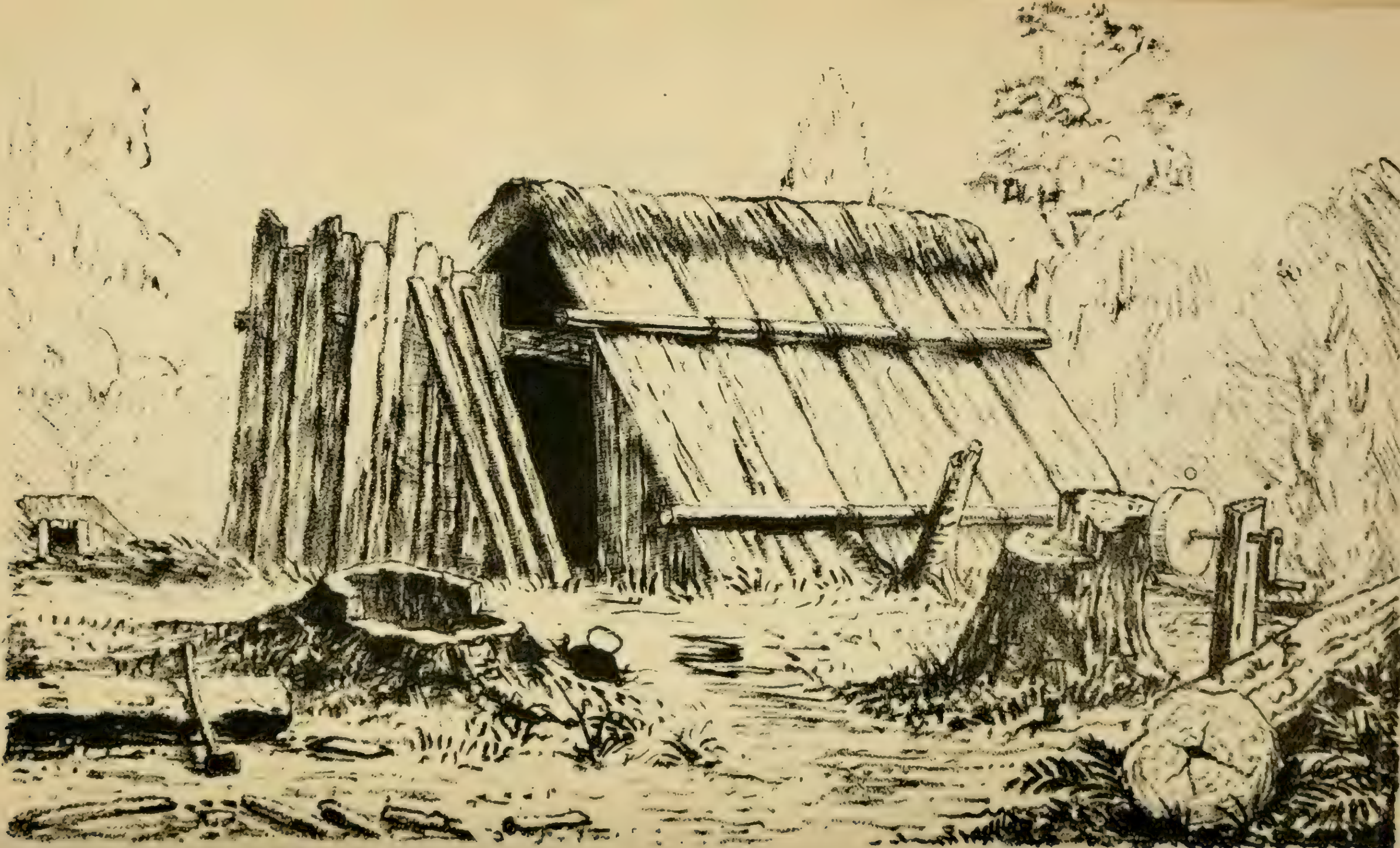
The river has been followed up and the timber along its course gradually cleared out until the beds which produce the present supply are reached, from fourteen to eighteen miles up. To visit them I took the course usually followed by the piners, except on special occasions; going from the settlement by boat up the river as far as the Pen at Brooke's Bay, we then shouldered knapsacks and walked about four and a half miles to the head of Long Fall, thereby cutting off a large elbow of the river, and avoiding Hell's Gates, Long-Tom Fall, and the Broken Road, all difficult for boats. From Long Fall we again took boat and pulled about a mile up a beautiful still reach, the banks studded with ferns and pinkwood in full flower, and landed on the right bank. From this landing place is a pathway, considerably less distinct than a wombat track, for about eight miles chiefly among button grass, to their general rendezvous opposite the Bark Hut Creek. Here the timbered flat is wide, and this has been one of the most prolific beds, as the stumps testify; and although some pioneers, Doherty, Woolley, and others have pushed on further up the stream, there are still many trees got from this locality, formerly overlooked or considered too difficult of access. There are numerous young trees growing up, which should be preserved till they have attained a certain size. Here are generally several boats on each side of the river for persons going or returning. Navigation extends very little further, except for log-clearing. There is a track to the settlement down the left or east side also, but it is about three miles longer than the other, and the Crossing River has to be forded.

The Crossing River, which comes from the Arthur Range, is sometimes called locally the Davey River, being rather the wider of the two at their confluence; and the Davey River proper is, in that case, called the DeWitt River, the DeWitt going by the name of Badger Creek. This is owing, in a great measure, to the meagre information on the official map. The Davey rises between the junction and Wilmot Ranges, and flows down the wide valley to the west and southwest of the Frankland Range, in two branches, which unite about a mile above Bark Hut Creek. The Crossing River joins the Davey about two miles above the Long Fall, coming in abruptly from the south-east, having burst through a high range by a narrow ravine in the same unexpected manner as the united streams pass through the gorge of Hell's Gates, instead of traversing the low valley which seems to be the natural course. Many of the small creeks have the same peculiarity, so that it is difficult to make a correct topographical sketch of the district on a short visit. My opportunities of taking observations were too few to enable me to submit with any confidence a plan to illustrate the district.

The pine trees grow in the densely timbered alluvial flat in the valley of the river, subject to frequent inundations, and varying in width from about 100 to 1,200 yards, intersected by a network of creeks and channels formed by the flood waters, and filled in the winter months. These channels



Hells Gates, River Darcy



Dahertar's Badger-box

have to be cleared of obstructions, fallen timber, etc., so that the pine logs may be floated down to the main river. Tracks have also to be cut through the scrub, about 18 feet in width, and sets of "skids" laid down so that the logs may be rolled into these channels or into the river. Hence the forests are traversed by numerous skid roads winding in all directions, to suit the trees successively cut down. In some places the floods occasionally rise high enough to enable boats to be used and the logs floated out over the ferns and undergrowth.

After the logs are cut to their proper length and stripped of their bark, they are branded at the ends with the initials or mark of the owner,—letters generally an inch in height,—punched into the wood with a smart blow of a hammer. Doherty told me he had known cases where as much as two inches had been sawn off the end of a log so branded, with a view to its appropriation, and the brands made in the above manner were detected by putting boiling water on the new faces or ends, whereby the old marks became visible;—the punching process affecting the fibres to an extent that a brand by hot irons would not.

After the logs are in the river commences the work of "clearing down" whenever there is a flood. The logs on their passage down get jammed at eddies, stranded on low banks, or otherwise detained. Two men go in a dingy, one to pull, the other with an iron-pointed prodder to release the logs and push them into the current. The dingies are of the shape commonly used about the Huon,—square stem and stern, and without keel, so that they are quickly turned round and easily guided by experienced hands. From the narrowness of the river in many places, this is the best sort of boat for coming down the rapids. This work is attended with considerable danger, and requires skill and presence of mind. Henry Longley and his mate Buxton were drowned in the Huon when so employed about three years ago. To the honour of the Port Davey piners, they are always willing to devote part of their time to show the special dangers of the river to any new comer. I came down from the Bark Hut Creek in one of these dingies, to see the nature of the river; and although there was only a small body of water I enjoyed the trip. The scenery is beautiful, especially about the Bay of Islands and the Davey Rapids. There are many rapids in the river, all with characteristic and well known names: in fact every eddy or remarkable spot has a local name, as well as the creeks, plains, and hunting-grounds about the Port, which do not always coincide with those on the official plans.

The dwellings occupied by the piners when up the river are of the style known as "Badger-boxes," in distinction from huts, which have perpendicular walls, while the Badger-box is like an inverted V in section. They are covered with bark, with a thatch of grass along the ridge, and are on an average about 14 × 10 feet at the ground, and 9 or 10 feet high. The sleeping bunk, raised about three feet, occupies the whole of one end, and can accommodate six people easily. The other end is enclosed by the fire-place, if on high ground; but those in the flats among the pine are left open in front, with the floor slabbed, and provision made for mooring the boat to the bedpost. Longley, before mentioned, kept a careful and minute diary for several years, and makes frequent entries illustrative of this life, such as the following:—

1863, April 3:—Went in the dingie to a stump to make a fire to boil the kettle for breakfast.
1863, April 7:—Log getting; Longley and Doherty cut off a log, up to our waistbands in water.
1863, July 4:—Water 2 feet up the posts of the bunk this morning. Had to boil the kettle on a stump.
1864, Oct. 12:—Took rations to the Badger box. Water up to our waists.
1867, Aug. 22:—Did not go to bed last night, as the water was rising until daylight this morning.
1868, Oct. 6:—Flood over the second step this morning.

And many others to a similar effect.

The men are generally employed in pine-getting and rolling into the river, during February, March, April, and May, with occasional visits home for rations, etc. After that they are on the constant watch for floods, and go up the river to clear down whenever there is a chance. When the logs reach the tidal water they are caught and put into "pens," which are enclosures in some eddy or still water, formed of stakes interlaced with brushwood, and a log chained across the entrance as a gate. When a vessel comes for a load, from 10 to 18 logs are fastened together into a raft, and towed down below the bar alongside the vessel at the usual anchorage. The settlement has extended in this direction since my last visit, and there are now several dwellings close to the anchorage.

As regards distribution of ground, there is an understood code of honour among them not to interfere with each other within a certain distance, so well observed that I heard no complaint of any one having taken an undue advantage. A creek or flood-channel is usually the centre line of a property, and is followed up on both banks. Any new comer wishing to go higher up the same creek must go ahead at least a quarter of a mile.

Longley's diary for the years 1863, 1864, 1865, and 1866 will give a fair sample of a piner's employment. He had three others as partners; and I find that his time was occupied on an average of these four years as follows:—100 days each year up the river felling timber and clearing down; 135 days at work at home, catching logs, squaring or sawing them, rafting and loading vessels, repairing boats, vessels, huts, pens, etc., gardening, and building vessels; 55 days hunting, fishing, and getting mutton-birds; 55 days visiting Hobart Town, including voyage and detentions; and 20 days unemployed, being Sundays, holidays, or bad weather. They built two vessels during these years, one of which was lost in Recherche Bay on its way to town to be sold. In the season ending June, 1861, they got pine logs to the extent of 58,336 feet, the quantities varying each week owing to track or creek clearing and other causes. During the week ending 5th March they got 4,509 feet; that ending 7th May 7,203 feet; that ending 21st June 2,234 feet. In another week they got as much as 9,440 feet. The size of the trees recorded also varies much. Logs 10 or 11 feet in girth were counted large; this would represent trees over 4 feet in diameter at the butt. The average seem to be 6 or 7 feet in girth. It is matter for consideration whether the supply of timber should be preserved, and the destruction of the beds prevented, by prohibiting the cutting of any trees under a certain size.

Many of the smaller trees in these forests would make good cabinet woods if there was any demand. The pinkwood *(Eueryphia Billardierii)* is hard, and has a fine colour. Like hickory and horizontal, the green logs make better camp fires than most of the dead timber that can be got in the dank forests where they grow. The hickory (*Phebalium Billardierii*, alias *Eriostemon squamea)* should also be a valuable wood. It is the only timber except the pine which is perfectly sound and dry inside after being submerged for years in muddy deposits, nearly all others being more or less rotten and discoloured. It is pale yellow in colour, and very tough. The ordinary size of both these is about 15 inches in diameter, with straight barrels 40 or 50 feet in height. They are common in all the western forests, and are abundant about Mounts Bischoff and Ramsay, and round Lake St. Clair.

Close to Observatory Point is Pebbly Beach, and on this, ever since Doherty remembers, lumps of coal are washed up after strong southerly weather, though no indications of coal-seams have been discovered on shore. Sandstone was reported to me as found up the Crossing River. Samples of both, with full information as to the dip and direction of the latter, have been promised me, and I will lay them before the Royal Society when I get them. Limestone occurs in the Davey Valley, protruding in various places, bearing from each other a little to the west of north. I found the fern Todea Africana, but differing in habit from those in Northern Tasmania. Here it grew on the steep rocky banks of the Davey River with hardly any stem; there it is usually by the side of a creek, with large stems a yard or so in diameter. An Alsophila is met with up Pine Creek, but which variety I had not the opportunity of ascertaining.

The great drawback to the settlement at Port Davey is the absence of all educational advantages for the children. When Mr. Collis was stationed at Recherche Bay, some of the settlers managed to send children round there, but since his removal they are entirely dependent upon what the parents can impart, and as a rule there is too much hard work to be done to leave any time for that purpose. It is one of those exceptional spots which should not be tied down to the strict rules of our educational system. The people have also been utterly neglected by the clergy of all denominations, the latest visit being that of Archdeacon Davies, on the occasion of a pleasure trip in the City of Hobart 15 years ago, when he held a service at Bramble Cove, 8 miles from the settlement, so that hardly any could attend except the excursionists. I am certain that the visit of a regular clergyman would be well received there, without any fear of such a reception as described (on 15th April last) by a Mr. Cameron, with reference to some parts of the Huon district, of which he is reported to have said: "In many of these places a minister of the gospel would be hooted."

For a florid, yet not inaccurate, description of the scenery, I would recommend any one to look up the account by David Burn of Sir John Franklin's visit in 1842, published in the *United Service Magazine* for 1843. In an older work, *Views in Australia,* published in 1824, by J. Lycett, artist to Major-General Macquarie, the author's fancy carries him to the future when its shores will be dotted with villas and gentlemen's residences. James Backhouse also describes the place in chapter 3rd of his book on the Australian Colonies, having been obliged to spend 17 days there in 1832, during which the sheep were put ashore to feed. He mentions also the heaps of oyster shells.

But as I have endeavoured to make these remarks as short as possible, and to limit them chiefly to my own experiences at Port Davey, I shall not go into its previous history or industries, or discuss its capabilities of improvement and settlement, or the probability of its being a mineral district. I hope to pay it another visit to further test the latter point.

I shall therefore conclude by placing on record the mutilated remains of the inscriptions in the cemetery. It is reported that a few years ago the crew of some whaling vessel cut down most of the wooden monuments for firewood; and whereas there were about twenty as far back as 1849, there are now but four, only one of which is perfect. I was reluctant to credit such a tale, but it was confirmed by the axe-marks on one of those still standing! Two others are lying on the ground among the heath and flowers, the spot where they were erected being untraceable. The inscriptions are as follows:—

I.

SACRED
TO THE
+ MEMORY OF +
PATRICK BOURKE
HE WAS KILLED BY
A FALL FROM THE BARK
PLANTER'S MAST-
HEAD OFF MAQUARRIE
HARBOUR FEBRUARY V 1872
AGED 21 YEARS

REMMEMBER-MAN-AS-YOU-PASS-BY
AS-YOU-ARE-NOW-SO-ONCE-WAS-I
AS-I-AM-NOW-SO-YOU-WILL-BE
PREPARE-FOR-DEATH-AND-FOLLOW
+ ME

The above painted in white letters on a black ground. Erected lately by Capt. Reynolds, and fenced in.

II.

IN MEMORY
OF
GEORGE,
NATIVE OF MANGEA DIED
ON
BOARD THE BARQUE TERROR April
4 1853 AGED 20 YEARS.

III.

SACRED
TO THE
MEMORY
OF
MATTHEW HENDRY
KILLED ON BOARD THE
MAID OF ERIN
FELL FROM THE MASTHEAD
ON THE 29 DAY OF JANUARY 1863
AGED 32 YEARS

The above two inscriptions cut into the wood. The boards are lying on the ground.

IV.

SACRED
TO
THE MEMORY ....
JOHN CHA.. ......
WHO DIED.........
BOARD BRIG "RO.....
13 January 1......
AGED 39 YEA.....

This was erected to John Chard of the brig "Roscoe," date not ascertained. It is much mutilated, and has been chopped with an axe.

The following is an extract from the account referred to in Mr. Scott's paper:—

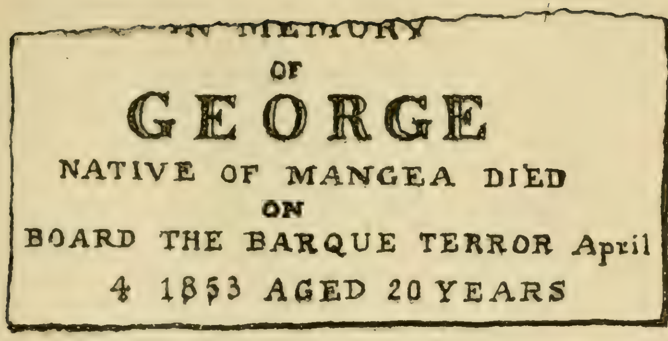
"*Narrative of the Overland Journey of Sir John and Lady Franklin and Party from Hobart Town to Macquarie Harbour.* By David Burn, Author of "Van Diemen's Land, Moral, Physical, and Political."

Tuesday, 17th May, 1842.—* * * At 2 p.m. a seven-knot easterly breeze enabled the Eliza to make a bold look up for the pyramidal rock, marking the entrance to Port Davey, and which now bore north. The Maatsuykers Islands were rapidly shut in as we drew along the bare, leafless, rugged coast, whose fantastic points looked dull and cheerless in the hard blue sky. They reminded me of the iron-bound ramparts that girdle the neighbourhood of Arbroath, and fancy could almost lead me to picture the celebrated, luckless, Tyrone Power, as he once stood upon one of the craggy points of the latter, delivering with much gesticulation (for he was a tragedian then) the oration of Antony over the body of Cæsar. At 4 the heads of Port Davey were gained, but the wind had fallen light, and, although the anchorage was but half-a-dozen miles distant, still the flood rushing out was so powerful that four bells of the first watch had been struck ere the anchor rattled over the bows. The moon became overcast, and heavy rain fell fast.

Wednesday, 18th.—A considerable quantity of rain fell during the night, but the weather continued moderate, although the barometer had sunk gradually from thirty to three-tenths thereunder. Morning dawned upon a clear sky, but less hard and less dazzling than those which had gladdened the three preceding days. We were reposing within the charming circular basin that forms the romantic haven of Port Davey, our schooner the centre of a wild but strikingly beautiful panorama, the quartzy mountains rearing their magnificent cones in pearly grandeur to the sky, or sawing the air with pinnacled ridges, broken into every conceivable figure and form, their naked sides being furrowed with countless gorges, ravines, or gulleys. Right ahead, or N.W., the river Davey wound its silent course. On the larboard or western hand, the low woody land called Garden Point presented its sequestered shores to be laved by another Kelly's Basin. On the starboard hand, or about E.S.E., the entrance to Bathurst Harbour, and Spring River, was just discernible. Numerous craggy

Port Davey Cemetery: 22 March 1875.

N.B. Erected to John Chard of the "Roscoe"; date not ascertained.



Port Davey Cemetery. 22 March 1875.

N.B. These two are lying on the ground among the shrubs

islets guard the shore, one steep cliff showing a seemingly extensive cavern in its perpendicular face.

At 7 the anchor was aweigh, and we were working down towards Bathurst Harbour, the entrance to which lies on the south-east shore of Port Davey, about three miles above the pyramidal rock. It is guarded on either hand by islands of the most picturesque beauty, their summits shaded with peculiarly ornamental and umbrageous dwarf foliage, giving to their crown the same unspeakable grace that a fine head of hair imparts to the human face divine. The starboard island was named after Mr. Ronald Gunn; the smaller one on the larboard or north side, was styled "Kathleen Isle," a title given by Lady Franklin, in compliment to the wife of the writer. Some pretty, sharp, pinnacled rocks jutting from this isle, received the appropriate appellation, "Mavourneen." The faces of these islands and the circumjacent shores are composed of slabs of quartz, packed, if I may so express it, in slate-like layers. They are perforated with numberless caves, every bight and cove developing an infinite variety of such deep indentations. The conical hills of quartz, with the tiny patches of verdure minutely interspersed, give a mosaic-like character to the scene. Nevertheless, the elegant though rugged contour of those hills—the multiform, tortuous undulations of their sterile steeps—the dangerous acclivities of their scathed and frowning chasms, all combine in the production of a landscape singularly romantic; one that in a rude clime and wintry welkin, would inevitably be classed amongst the savage, a designation from which the genial atmosphere and Italian blue of the sky that o'er canopies, alone preserves it. Despite its barren character, even in the boisterous north, it might *sometimes* be termed a soft scene, every outline being so gracefully rounded—every asperity so much subdued. Light airs and floods proved annoyingly adverse to our outward progress, many hours being frittered away in the labour of a few minutes. We could do no good, and were, eventually, compelled to anchor.

At 11h. 30m., the gig pushed off on a trip up Spring River. The party it contained consisted of Sir John and Lady Franklin, Mr. Milligan, Mr. Giffin, second officer of the Eliza, and myself. About a mile above Kathleen, opposite to a conical peak of quartz, and close to the anchorage the schooner had been striving to gain, lies "Turnbull Island," named after the interim Colonial Treasurer. It is a low, rocky, brushy lump, bare at the summit and fringed at the edge, like a friar's pate. Above Turnbull some beautiful miniature bays are formed by a large projecting tongue of land, bare, verdant, and divided into conical swells towards the centre, but skirted with a leafy screen towards the water. Close to this point, a low, woody, circular island occupies the centre of the channel. In honour of Miss Franklin's governess, it received the appellation, "Williamson Island." Spring River here becomes perfectly land-locked; its waters expanding, and assuming the form of an extensive hill-embosomed lake. The day, hitherto, though dry, had been chilly; Apollo hid his glories in a vapoury shroud, peering occasionally through, not penetrating, the scene he seemed desirous to illume. Rounding a bare promontory on the north shore, we entered a second extensive lake. A rugged, lofty, quartz mountain, *now* called "Bracondale," lay right ahead, or E. by N. At its foot a pretty little fairy islet, covered with shrubs, received the name of "Louisa." The main channel, which we ascended, bore N.E., whilst a very lovely minor branch stretched away to the S.E. At this point the landscape became one of great and varied magnificence, being broken into numberless diversified bays and dells, winding valleys, and craggy ranges. We disturbed sundry black swans in our progress. Mr. Milligan having been put on shore, brought some shrubs and stones from Louisa—a memorial for the fair lady after whom the island had been named. During the stoppage consequent upon this debarkation, the sun broke forth, gilding with liquid glory a most conspicuous ridgy ravine that intersected the towering grassy mountains of the north shore. Immediately above Louisa Isle the hills separated into a broken spreading valley, Bracondale forming the upper, and a grassy, elevated, flat-topped mount, its advanced guards. This valley is watered by another branch of Spring River, or, very possibly, upon accurate investigation, these branches may be found to be but limbs of an extensive sea-arm. A channel of some two miles brings the tourist to a third and much larger lake, most enchantingly studded with various low, brushy islands. This lake flings its ramified, glittering limbs deep into the bosom of the mountain region wherein it is embedded. The picture it presents is one of indescribable magnificence, varying in character every thirty or forty yards. Here a smooth, grassy hill thrusts its velvet limbs into the wave. There an endless succession of wild, irregular cliffs, split into figures of the most extraordinary magnitude and extravagant form, pierce the sky with their uncouth points. Some are hollowed like gigantic punch-bowls, fit for the revels of the Cyclops; others assume the aspect of Nature's primitive fortifications, being ranged in long and imposing lines, tier over tier of deeply-scarped battlement and fosse—the naked crags presenting a variety of tints, white, pink, and slate being the prevailing hues that glanced and flickered in the varying sunlight. Hill soars over hill—crag surmounts crag—whilst peak and mountain-cone tower to heaven their proud pinnacles, shown in bold relief or veiled by the fleecy canopy that, ever and anon, strives to envelop their aspiring fronts. Nature is untarnished, primeval majesty reigns here supreme, whilst man looks on to wonder and adore. Would that the painter's art were mine! Would that I could give were it but a feeble copy of this transcendant picture; the subject could not fail to have inspired my pencil, it would have taught me to pourtray the glorious landscape in all its racy characters of heaven-born grandeur. This panoramic enchantment lies about eight or nine miles above Bathurst Harbour, the expanse of its waters terminating two or three miles further north, whilst the river, or what is said to be the river, flows from the E.N.E. for what distance has yet to be determined; ten or twelve long summer days might be most deliciously spent in the investigation of this little known locality. It is much to be regretted that the land, *seemingly*, is of such small avail, either agrestially or pastorally, because, with a moderate share of fair soil, the favourable position and immense navigable facilities of Port Davey must otherwise render it a settlement of paramount value. A century may (is sure to) achieve what the present age cannot well accomplish.

We debarked upon a smooth, pebbly beach, partaking of a comfortable refection of ham, and bread and cheese, the task of deglutition being rendered easily practicable with the aid of some choice brown stout and superlative sherry. At 4 we plied the homeward oar, regaining the Eliza at 6, after having encountered a slight shower during our homeward progress. Mr. Bagot and Captain Harburg had preceded us with five swans. Strange! when the shooting a few of these birds would have afforded a most acceptable food to the famished pilgrims, we could, by no possibility, steal within reach ; now that they were valueless, we had them to kick about. Having inspected everything that the advanced season of the year and the threatening aspectof the weather rendered conveniently practicable, the Eliza, at 7h. 42min. p.m., weighed anchor and dropped out of Bathurst Harbour with a light air from the N.W. At 8 we passed between Gunn and Kathleen Islands, opened the Great Caroline (a name given by whalers) pyramidal rock, and, with a flowing sheet, stood to sea.

ON THE VITAL STATISTICS OF TASMANIA, WITH ESPECIAL REFERENCE TO THE MORTALITY OF CHILDREN.

By E. C. Nowell, Government Statistician.

[Read 12th October, 1875.]

In most things Tasmania is at a great disadvantage as compared with the neighbour colonies. The larger extent of their territory, the more open nature of the country, their greater, or reputedly greater mineral wealth, the more profitable fields for the employment of capital which they have hitherto offered, have rendered our colony incapable of competing on equal terms with them in all matters relating to production, trade, and commerce. The one advantage which Tasmania does enjoy is her climate; and it seemed to me that in showing in the fullest and most convincing manner her superiority in this respect, especially as regards the health of children, I might be doing some practical service. The mortality in the towns as compared with the country parts, was also one of the questions which I proposed to myself to investigate, and I therefore set about constructing, with the aid of my assistant, Mr. J. J. Barnard, a series of tables, intending to embody the results in my statistical report for last year. But as the subject could be treated only very briefly in such a report, and as the tables, which contained details that seemed to be worth preserving, could not be embodied in it, I resolved to lay them before this Society in the hope that, by drawing public attention to the facts thus brought out, their full significance might be made more widely known. Another inducement to take up the subject was, that my work would fit in with, and supplement, the comparative statistics published last year by the Government of Victoria. Two objects would thus be served—first, attention would be drawn to Tasmania as a desirable place of residence for persons seeking for themselves or their children a healthy climate; secondly, another contribution, however humble, would have been made to that stock of knowledge of man's physical and moral nature, which we have as yet only begun to acquire from the analysis and comparison of statistical facts.

The first set of tables (A to D) shows the mortality of children up to the age of 10 years as between Tasmania and the Continental Colonies. The second (E to N) shows not only that of children at this age, but also that of persons at "all other ages" in Tasmania alone, under the following divisions:—1. The whole Colony. 2. Hobart Registration District. 3. Launceston Registration District. 4. The two collectively, forming the "Urban Districts." 5. The remainder of the Colony, forming the "Rural Districts."

Appended to the abstract tables are other tables, giving the data upon which the former are based, so that every one who consults them may be in a position to check the calculations for himself, and detect the errors, if any should have crept in.

The period embraced in the returns is the five years from 1869 to 1873. Where the figures were not to be obtained from the published statistics of the other Colonies, they were procured by direct application to the Registrars-General, whose courtesy in furnishing them I desire to acknowledge.

I shall consider the general tables first; and those relating specially to Tasmania afterwards.

"Real *infant* mortality," says the Registrar-General of England (1872), "may be satisfactorily measured by its proportion to births registered." This is shown for the Australian Colonies and Tasmania in table A. The average number of deaths of infants under 1 year to 100 births for each colony, ranged in descending order, was:—

South Australia	14·24
Victoria	11·86
Queensland	11·07
New South Wales	9·57
Tasmania	9·45

Here the superiority of our Colony is at once seen. In England, the proportion was, in 1869, 15·6; in 1870, 16. In Scotland, in 1870 (an average year), it was 12·28. Even South Australia, the Colony least favourable to infant life, was more so than England. The average rate for 10 years (1864-73) in Victoria is said, by the Government Statist in his copious and careful report for the latter year, to be 12·4.

The next test which I shall employ, is a comparison (table B) of the proportions which the deaths of children bore to 100 deaths at all ages. To go through all the ages in a *resumé* like this, would hardly leave any clear idea of the differences, but would rather tend to confuse the mind, and I shall therefore confine myself to a few particulars, referring those who wish for more information to the tables themselves. The deaths under 1 year were:—

	Per Cent.
South Australia	39·86
Victoria	30·29
Queensland	30·25
New South Wales	27·79
Tasmania	20·29

Here the order is exactly the same as before. Between one and two years of age there is a change, and the Colonies stand thus:—1. Queensland; 2. Victoria; 3. N. S. Wales; 4. S. Australia; 5. Tasmania: the last still having the lowest rate, which it keeps through all the ages up to 10, except in one, 5-10, in which the rate is the same as in Queensland. Between 0 and 5 years, the proportions and order were:—

	Per Cent.
South Australia	54·17
Queensland	46·33
Victoria	45·50
New South Wales	42·14
Tasmania	28·08

In England (1870) the proportions were—Under 1, 24·57; 1 to 2, 8·01; 2 to 3, 3·89; 3 to 4, 2·65; 4 to 5, 1·95; 0 to 5, 41·07; 5 to 10, 4·47; and between 0 and 10, 45·54. The deaths under 1 year were therefore less in proportion than in any of the mainland Colonies, but considerably more than in Tasmania. In Scotland, taking the mean of males and females (the result of which, though not strictly accurate, is sufficiently near the truth for general comparison) the percentages were—0-1, 19·12; 1-2, 7·83; 2-3, 4·05; 3-4, 2·84; 4-5, 2-11; 0-5, 35·96; 5-10, 5·50; 0-10, 41·49. At the age 0-10, in this Colony the percentage was only 30·84.

Table C shows the proportions which the deaths of children under 10 bore to 1,000 of the total living population. And here it should be remarked that it has hitherto been our practice in making such calculations, to take the population at the end of each year, while the other Colonies take it at the middle of the year. This, by making the divisor larger, gives us a slight advantage, but the difference is not sufficient materially to interfere with the result. At the age 0-1, the Colonies stand thus:—

	Per 1,000.
South Australia	5·35
Queensland	4·52
Victoria	4·38
New South Wales	3·70
Tasmania	2·79

The same order is observed at the ages 0-5 and 0-10.

I now come to the series of tables constructed for this Colony alone. But before considering them, it may be well to explain some matters connected with the population as therein stated. The object for which the last census was taken being chiefly political, namely, an alteration in the franchise, the population was enumerated according to Electoral Districts only, and not according to Registration Districts. Since, however, the Registration District of Hobart consists of the Electoral

Districts into which the City of Hobart Town is divided, together with those of Queenborough and Glenorchy, the number of whose inhabitants is known, the population at the date of the census can be computed exactly, and the present population can be easily found by calculation, on the assumption that the increase is proportionate to that of the whole population of the Island. But the population of the Registration District of Launceston cannot be so readily found, the Registration District not being conterminous with any Electoral District. It consists of the Electoral Districts within the boundaries of the town of Launceston, together with a portion of the Electoral District of Selby, the number of whose residents is not known. The town of Launceston, according to the census, contained 10,668 persons, and I have estimated the number residing in the portion of Selby which forms the remainder of the Registration District, at 1,500, making the population of the whole of that district at the date of the census, 12,168; and the increase since 1870 has been calculated on the same assumption as before. For 1869 a slight deduction had to be made for the numbers shown by the census of February 7, 1870: for Hobart, the population has therefore been estimated at 24,921; for Launceston, at 12,100; and for the whole Colony, 99,000.

The first table (designated E) shows that while the average percentage of deaths during the first year of life to births in the year was 9·45 for the whole Colony, in the Hobart Registration District it was 12·93; in the Launceston District, 13·02; in the two together, forming the Urban Districts, 12·89; in the remainder of the Colony, or the Rural Districts, 7·28. The difference in the mortality of the least healthy of the Urban Districts, as compared with the Rural, the most healthy—that is, between the maximum and minimum mortality—was therefore 5·74; while the difference between the rural rate—the minimum—and the general rate, was 2·17.

Table F shows the percentage of deaths at each age to deaths at all ages in the Urban and Rural Districts. Here we see the curious fact that while for infants under 1 year the proportion in the whole colony was 20·25, in Hobart, 18·14, in Launceston, 19·07, and in the two last collectively ("Urban" rate), 18·47, in the Rural Districts it was 22·70. The general rule was in this case reversed, the proportion of deaths being *greater* in the country. So it was for the ages 2-3, 3-4, 4-5, and 5-10; while for "all other ages" there was a considerable difference in favour of the country districts, the general average being 69·87, the Urban rate 72·36, and the Rural only 64·76 per cent.

A comparison of the number of deaths at each age to 1,000 persons at all ages (table G) shows in every case a considerable advantage on the side of the rural districts, to the extent of 24·73 per cent.* for infants under 1 year; 36 54 per cent. for children up to 10, and 37·25 for all ages above. For all ages, the mortality throughout the colony was 13·78; in Hobart district, 20·49; in Launceston 23·26; in the Urban Districts, 21·39; in the Rural, 9·24. These figures show a considerable excess at Launceston; but it would be wrong to conclude upon this ground alone that the mortality is greater in the town itself than in Hobart Town. For the district of Hobart included (Feby., 1870) a suburban population of 5912, in which the rate of mortality was less than in the city; while, if my estimate be correct, the suburban population in the Launceston district amounted to no more than 1500; so that the proportion of the suburban to the urban population was, in Hobart district, about 24 per cent.; in Launceston about 12. The suburban, or more healthy population being thus smaller in the district of Launceston, the mortality for the whole registration district might naturally be expected to be somewhat greater. In Victoria in 1873 the urban rate was 19·41 per 1,000; the rural 9·14; in N. S. Wales in 1872,—Sydney, 22·09; suburbs, 14·48; rural, 12·32. In England (1871) the general rate being 22·6 per 1000, the minimum of the country rates was 17·3. In Scotland, according to the Registrar-General's reports, the rates in 1870 were:—Principal towns, 27·03; large towns, 25·24; small towns, 22·49; and rural districts, 17·95. The excess in the urban rate as compared with the rural would, therefore, be—in Tasmania, 61·37 per cent.; in Victoria, 52·91; and as between Sydney and the rural districts of New South Wales the excess was 56·23 per cent. Assuming the rate for the larger towns in Scotland to be about 26 per 1000, the excess in the mortality over the rural districts would be 30·96 per cent. The difference in the rate of mortality between the most and least healthy counties in England in 1871 was 11·2 per 1000, or 30·30 per cent.; the highest rate being 28·5 in Durham; the lowest 17·3 in the extra-metropolitan parts of Surrey and Kent. Between the highest death rate of the large towns in Great Britain in that year (being 36·5 in Sunderland), and the lowest county rate (17·3), the difference was 19·2 per 1000, or 52·60 per cent. An epidemic of small-pox prevailed in Sunderland and several other large towns, increasing the rate of mortality, which in cities so much more populous than our own chief towns, ought always, according to the well-ascertained relation between density of population and disease, to be far greater. Yet, not-

* Taking the rate for the whole Colony as the standard of comparison.

withstanding these disadvantages, the city mortality was not so greatly in excess of the rural as in Tasmania. Nor is this to be wondered at. A filthy open sewer runs through Hobart Town, and after receiving its contributions of excrementitious and other refuse matter from all the smaller sewers, and numberless latrines that skirt its sides, discharges its black and fetid gatherings into the Derwent. When the tide is in, the accumulations at the lower end mix with the waters of the river, and are at once carried off. But when the tide is out, they are not immediately taken away, but form a broad, sluggish stream, poisoning the air with their fever-laden exhalations. If the excreta and other noxious matters which are now thrown into the creek were applied to their proper purpose, namely, the fertilisation of the soil, the health of the city would be improved, the supply of food would be increased, and a number of persons might find a living in collecting the offensive substances, and converting them into manure. The cases of typhoid fever and diphtheria which have from time to time occurred in Hobart Town, especially during the present year [see table O], ought to be a warning of the danger of further delay in setting about improving the sanitary condition of the principal towns. Dr. Hall, in the remarks which he has at various times published, has strongly urged this point; and the figures which I have now produced give additional weight to his warnings.

But while the deaths in the towns are so much more numerous than they ought to be, if all available means were used to preserve the health of the inhabitants, it will be seen that the rural rate is very low, only 9·24 per 1,000. And this is much above the ordinary Tasmanian rate, the general death rate having been unusually high in 1870 and 1873. For each of the five years the rural rate was—1869, 9·16; 1870, 9·98; 1871, 8·63; 1872, 9·17; 1873, 9·25. The mean of the three normal years, 1869, 1871, and 1872, was 8·99. In Victoria, in 1873, the rural rate is stated to have been 9·14. In reference to the higher town rate in Tasmania, it has been alleged that it has been caused by the influx of sick people into the towns for the sake of better medical treatment, and by the pauperism congregating there. What proportion of the excess is due to the first cause, I have no means of ascertaining; but I am willing to admit that the greater age of many of the paupers in Hobart Town and Launceston must operate unfavourably in the comparison. Of the deaths 18 per cent. in Victoria took place in hospitals; in Tasmania, only 10·84 per cent. In the insular districts of Scotland, where the mortality is lowest, the death-rate ranges from about 13 to 18 per 1,000.

A better criterion of the relative healthiness of town and country is furnished by table H, showing the deaths at each age to 1,000 persons at the corresponding ages, the numbers living being calculated on the supposition that the proportions continued the same as they were at the date of the last census. The result may be most clearly exhibited as follows:—

Ages.	Hobart.	Launceston.	Urban Districts.	Rural Districts.
0-1	133·52	155·37	140·77	70·32
1-2	31·63	39·75	34·42	12·00
2-5	8·14	7·83	8·04	5·34
0-5	38·33	44·12	40·26	19·50
5-10	2·95	3·47	3·12	2·25
0-10	19·76	23·39	20·95	10·94
All others................	20·78	23·20	21·57	8·51

The difference as regards infants under 1 year, between the mortality in Launceston and Hobart Registration Districts was 21·85 per 1,000; between Launceston and the Rural Districts, 85·05; between Hobart and the Rural Districts, 63·20; and between the Urban Districts taken together, and the Rural, 70·45 per 1,000. The rate in the Launceston District was more than double that of the country districts. The mortality at all ages, except 2-5, was greater in the Launceston than in the Hobart District. Between 1 and 2 the Launceston rate was more than treble the country rate. Between 0 and 5 it was more than double. Between 0 and 10 it was also more than double. For all other ages it was nearly treble.

Taking the whole country, at the age 0-1, 95·66 died in every 1,000 at the same age living; at 1-2, 19·70; at 0-5, 26·78; at 5-10, 2·57; at 0-10, 14·56; at all other ages, 13·46. In Victoria, in 1873, the deaths (taking the mean between males and females, with the former reservation) at 0-5 were 39·36, being 12·58 more than in Tasmania. At 5-10 the Victorian rate was about 5·31, against our 2·57. The mean of males and females for 34 years (1838-71) in England was—0-5, 67·6; 5-10, 8·6. The mean of males and females in Scotland for 1870 was—0-1, 140·93; 1-2, 66·96; 0-5, 58·88; 5-10, 10·13. That means that about 45 in every thousand infants are saved in Tasmania, as compared with Scotland, in the first year of life; 47 in the second; 32 children under 5 years; and between 7 and 8 children from 5 to 10; or, to put it in another way, taking Tasmania as the standard, the excess of mortality in Scotland was nearly as follows:—0-1, 47 per cent.; 1-2, 240 per cent.; 0-5, 120 per cent.; 5-10, 294 per cent.

To make the returns as complete as possible, I have constructed a table (L) showing the percentage of the population at certain ages in Tasmania, Victoria, New South Wales, South Australia, Queensland, England and Wales, and Scotland. This table should be read in connection with some of the other comparative tables. From it we find that at the age 0-1, the proportion was smallest in Tasmania (2·91),—largest in Queensland (3·86). It was larger in Scotland than in England, and in the four mainland colonies than in Scotland. At 1-2, Scotland had the smallest proportion (2·60), Tasmania next (2·64), then England (2·71), then the continental colonies. At 2-3, 3-4, and 4-5, Scotland had more than England, the Colonies more than the former. In the Tasmanian census those ages were not given separately. At 0-5 England had the fewest children; Scotland came next; then Tasmania; then the other members of the group. At 5-10, England had the fewest; then came Scotland, Queensland, New South Wales, Victoria, Tasmania, South Australia. Children of all ages up to 10 were least numerous in England, then in ascending order came Scotland, Tasmania, Queensland, New South Wales, Victoria, South Australia. At all other ages, the order was—South Australia, Victoria, New South Wales, Queensland, Tasmania, Scotland, England. In these persons of 60 and upwards are shown separately; the proportions being as follows:—Queensland, 1·63; Victoria, 2·75; South Australia, 3·48; New South Wales, 3·97; Tasmania, 6·64; England and Wales, 7·44; Scotland, 8·11. In the Colonies the preponderance of old people is therefore in Tasmania; but still the proportion is less than in England or Scotland. The figures relating to England and Wales in this table are taken from the census of 1861, that for 1871 in its complete state not having reached me. There may have been some variations in the proportions during the ten years, but probably not to any considerable extent.

A large number of visitors resort to this colony every summer to recruit their health, allured partly by the coolness of its temperature, partly by the beauty of the scenery, and partly, also, by the reputation for salubrity which Tasmania has justly acquired. To preserve the latter is, therefore, a matter not merely of sentiment, in order to gratify our national pride, but of material importance, affecting our pockets; and I shall be glad if the facts which are here presented shall contribute in any degree to the adoption of efficient means of removing all those causes of disease which are under our control.

I am sorry that I have not been able to include New Zealand in these tables. Having the smallest general death rate of all the colonies, it would have been interesting to compare the mortality at different ages with that of the other colonies; but the practice which prevailed there until very lately of adding the still-births to the births and deaths, would have vitiated any comparison. The ratio of deaths of infants under 1 year to births in 1873 is stated to have been 10·81 per cent. The per centage of deaths for that year was:

Under 1 year	33·31
1-2	8·07
0-5	48·42
5-10	4·69
0-10	53·11
All other ages	46·89

It will be observed that the proportions for children are very much higher than in Tasmania. The Registrar-General says: "Of the total deaths in 1873, 48·42 per cent. were of children under 5 years of age. This rate at first appears exceedingly high when compared with the English rate, which was, in 1871, 41·1 per cent. of the deaths; but in making the comparison it must not be overlooked that there is in England a very much larger proportion of the population over 55 years of age than there is in New Zealand, and that the deaths of persons above that age were, in England, in 1870, 27·3 per cent. of the total deaths; whereas in New Zealand such deaths only comprised 11·41 per cent. of the whole number;" and he goes on to show that if the deaths of persons over 55 years had been in the same proportion as in England, namely, 27·3 per cent., the deaths of children under 5 would have been at the rate of 39·74 per cent. only. This quotation suggests the question, whether the smaller proportion of children's deaths in Tasmania may not be caused by a deficiency in the number of children living in proportion to persons of other ages, as compared with other countries; and this supposition seems to gain probability from the fact that in Tasmania the birth-rate is lower than in any of the Colonies, in England, or Scotland, the average rate (1869-73) being—Queensland (1869-72), 42·5 per 1,000; New Zealand, 40·67;* New South Wales, 39·45; South Australia, 37·65; Victoria, 36·93; Tasmania, 29·52; England, 35·2; Scotland, 35·10—the last two rates being for the 10 years, 1860-9. But the figures already given, showing the death-rate in relation to the numbers living at each age, prove that such a supposition will not account for the lower mortality among children which prevails in this island; and table L also shows that the proportion of children living in Tasmania does not differ materially from that which is found to exist in the other countries with which

* Including still-births until 1873, in which year the rate was 38·99.

I have compared it. After a careful consideration of objections such as we might expect one who was arguing on the opposite side to urge, I can come to no other conclusion than that the advantage which our Colony possesses in regard to the rate of mortality, especially that of infants and children, is chiefly due to the remarkable salubrity of its climate; and if the large amount of labour which has been expended on the construction of these tables has the effect of bringing this fact into greater prominence, I shall feel that it has not been bestowed in vain.

[A.]

TABLE SHOWING THE PERCENTAGE IN THE DIFFERENT AUSTRALIAN COLONIES WHICH THE DEATHS OF INFANTS UNDER ONE YEAR OF AGE BORE TO THE TOTAL NUMBER OF BIRTHS DURING THE YEARS 1869-73; ALSO, THE BIRTH-RATE PER 1,000 OF POPULATION.

Name of Colony.	1869.	1870.	1871.	1872.	1873.	Average for the Five Yrs.
Victoria	12·61	11·80	11·37	12·18	11·32	11·86
New South Wales	9·65	9·50	8·99	10·45	9·26	9·57
South Australia	13·06	14·52	13·57	16·11	13·93	14·24
Queensland	11·34	10·72	9·91	10·98	12·25	11·07
Tasmania	10·11	9·76	8·51	10·14	8·73	9·45

Birth-Rate per 1,000 of Population.

Year.	Tasmania.	Victoria	N. S. Wales.	South Austral.	Queensland.	New Zealand	England.	Scotland.
1869...	28·78	37·36	40·46	38·60	42·8	41·90	—	—
1870...	30·31	38·25	39·80	38·64	43·5	42·32	—	—
1871...	29·99	37·07	39·57	38·15	43·2	40·64	—	—
1872...	29·27	35·95	38·37	36·96	40·7	39·50	—	—
1873...	29·24	36·01	39·04	35·88	—	38·99*	—	—
1860-9	—	—	—	—	—	—	35·2	35·10
Sum...	147·59	184·64	197·24	188·23	170·2	203·35	—	—
Mean...	29·52	36·93	39·45	37·65	42·5	40·67	35·2	35·10

* Previous to 1873 still-births were included.

[B.]

TABLE

SHOWING THE PERCENTAGE, IN THE DIFFERENT AUSTRALIAN COLONIES, WHICH THE DEATHS OF CHILDREN UNDER 10 YEARS OF AGE BORE TO THE TOTAL NUMBER OF DEATHS, DURING THE 5 YEARS, 1869-73.

Name of Colony.	1869.						1870.						1871.					
	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10
Victoria....	30·89	9·71	3·20	2·25	1·56	5·25	30·74	7·95	2·73	1·84	1·43	4·68	31·40	8·83	2·73	1·74	1·46	4·08
N.S.W......	27·77	9·40	3·94	1·78	1·54	3·60	28·47	8·55	2·85	1·80	1·06	3·54	28·28	8·00	3·15	1·65	1·12	3·15
S. Australia	41·20	5·74	2·76	1·72	2·62	3·61	40·53	8·76	2·91	1·53	2·28	3·65	40·41	6·94	2·61	1·30	2·48	3·36
Queensland.	29·37	11·07	2·95	1·83	0·78	2·17	31·96	7·84	3·83	1·82	1·09	2·49	28·90	7·68	3·75	2·58	1·46	2·63
Tasmania ..	21·65	3·44	1·95	0·97	1·05	3·30	21·22	3·28	1·85	1·42	1·35	3·21	19·19	3·32	1·55	1·33	0·59	2·07

Name of Colony.	1872.						1873.						Average for the 5 Years.						Total Average.	
	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 5	Under10
Victoria....	30·78	8·85	2·86	2·09	1·81	4·61	27·66	7·67	3·01	2·42	1·88	5·25	30·29	8·60	2·91	2·07	1·63	4·77	45·50	50·27
N.S.W......	28·33	8·52	3·25	1·66	1·12	3·32	26·08	7·15	2·50	1·59	1·09	3·68	27·79	8·32	3·14	1·70	1·19	3·46	42·14	45·60
S. Australia	39·52	8·91	3·45	1·48	2·59	4·18	37·63	7·03	2·66	1·71	2·01	3·38	39·86	7·48	2·88	1·55	2·40	3·64	54·17	57·81
Queensland.	29·86	9·19	3·46	2·43	1·14	2·79	31·16	9·29	4·18	2·44	1·64	3·73	30·25	9·01	3·63	2·22	1·22	2·76	46·33	49·09
Tasmania ..	21·69	4·32	2·19	0·99	0·71	2·34	17·69	4·46	1·53	1·40	1·26	2·86	20·29	3·76	1·81	1·23	0·99	2·76	28·08	30·84

[C.]

TABLE

SHOWING THE RATIO IN THE DIFFERENT AUSTRALIAN COLONIES WHICH THE DEATHS OF CHILDREN UNDER 10 YEARS OF AGE BORE TO EACH 1,000 OF THE TOTAL POPULATION DURING THE 5 YEARS, 1869-73.

Name of Colony.	1869.						1870.					
	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10
Victoria....	4·71	1·48	·49	·34	·24	·80	4·51	1·17	·40	·27	·21	·69
N.S.W......	3·83	1·30	·54	·24	·21	·50	3·71	1·11	·37	·23	·14	·46
S. Australia	5·04	·70	·34	·21	·32	·44	5·61	1·21	·40	·21	·31	·50
Queensland.	4·80	1·81	·48	·30	·13	·35	4·55	1·12	·55	·26	·16	·35
Tasmania ..	2·92	·46	·26	·13	·14	·44	2·96	·46	·26	·20	·19	·45

Name of Colony.	1871.						1872.					
	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10
Victoria....	4·21	1·18	·37	·23	·20	·55	4·38	1·26	·41	·30	·26	·65
N.S.W......	3·49	·99	·39	·20	·14	·39	3·92	1·18	·45	·23	·15	·46
S. Australia	5·18	·89	·33	·17	·32	·43	5·95	1·34	·52	·22	·39	·63
Queensland.	4·12	1·10	·54	·37	·21	·38	4·33	1·33	·50	·35	·16	·40
Tasmania ..	2·55	·44	·21	·18	·08	·27	2·97	·59	·30	·14	·10	·32

Name of Colony.	1873.						Average for the 5 Years.						Total Average.	
	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	Under 5	Under10
Victoria....	4·08	1·13	·44	·36	·28	·77	4·38	1·24	·42	·30	·24	·69	6·58	7·27
N.S.W......	3·54	·97	·34	·21	·15	·50	3·70	1·11	·42	·22	·16	·46	5·61	6·07
S. Australia	4·99	·93	·35	·23	·27	·45	5·35	1·01	·39	·21	·32	·40	7·25	7·77
Queensland.	4·78	1·42	·64	·37	·25	·57	4·52	1·36	·54	·33	·18	·41	6·93	7·34
Tasmania ..	2·55	·64	·22	·21	·18	·41	2·79	·52	·25	·17	·14	·38	3·87	4·25

[D.]

NUMBER OF DEATHS IN AUSTRALIAN COLONIES.

VICTORIA.

Years.	Age at Death.									Population.
	0—1	1—2	2—3	3—4	4—5	0—5	5—10	0—10	All Ages.	
1869	3284	1032	340	239	166	5061	558	5619	10,630	696,942
1870	3203	829	285	192	149	4658	488	5146	10,420	709,839
1871	3114	876	271	173	145	4579	405	4984	9,918	738,725
1872	3334	959	310	226	196	5025	499	5524	10,831	760,991
1873	3181	883	346	278	216	4904	604	5508	11,501	780,362
NEW SOUTH WALES.										
1869	1858	629	264	119	103	2973	241	3214	6691	485,356
1870	1867	561	187	118	70	2803	232	3035	6558	502,861
1871	1812	513	202	106	72	2705	202	2907	6407	519,182
1872	2116	636	243	124	84	3203	248	3451	7468	539,190
1873	1985	544	191	121	83	2924	280	3204	7611	560,275
SOUTH AUSTRALIA.										
1869	911	127	61	38	58	1195	80	1275	2211	181,146
1870	1031	223	74	39	58	1425	93	1518	2544	183,797
1871	961	165	62	31	59	1278	81	1358	2378	185,626
1872	1145	258	100	43	75	1621	121	1742	2896	192,223
1873	990	185	70	45	53	1343	89	1432	2631	198,075
QUEENSLAND.										
1869	528	199	53	33	14	827	39	866	1761	109,897
1870	526	129	63	30	18	766	41	807	1645	115,567
1871	516	137	67	46	26	792	47	839	1785	125,146
1872	578	178	67	47	22	892	54	946	1936	133,553
1873	701	209	94	55	37	1096	84	1180	2250	146,690

[E.]

TASMANIA.

PERCENTAGE OF DEATHS OF INFANTS under one year to Births in the Registration Districts of Hobart and Launceston, as distinguished from the Rural Districts, in the five years 1869-73.

LOCALITY.	1869.	1870.	1871.	1872.	1873.	Average for the 5 years.
The whole Colony	10·11	9·76	8·51	10·14	8·73	9·45
Hobart Registration District	13·00	12·71	11·46	15·60	11·86	12·93
Launceston ditto	14·81	10·99	11·62	12·75	14·94	13·02
Urban Districts	13·63	12·02	11·30	14·56	12·95	12·89
Extra-urban or Rural ditto	7·65	8·28	6·69	7·52	6·28	7·28

[F.]

PERCENTAGE OF DEATHS at each age to 100 Deaths at all ages : average of five years, 1869-73.

LOCALITY.	AGE AT DEATH.									TOTAL.
	0—1	1—2	2—3	3—4	4—5	0—5	5—10	0—10	All other Ages.	
The whole Colony	20·25	3·78	1·81	1·24	1·00	28·08	2·75	30·13	69·87	100·00
Hobart Registration District	18·14	3·66	1·33	1·03	0·92	25·08	2·13	29·21	72·79	100·00
Launceston ditto	19·07	4·37	1·18	0·69	0·97	26·28	2·15	28·43	71·57	100·00
Urban Districts	18·47	3·91	1·28	0·91	0·93	25·50	2·14	27·64	72·36	100·00
Extra-urban or Rural ditto	22·70	3·60	2·55	1·70	1·09	31·64	3·60	35·24	64·76	100·00

[G.]

PROPORTION OF DEATHS at each age to 1000 persons living at all ages : average of five years, 1869-73.

LOCALITY.	AGE AT DEATH.									TOTAL.
	0—1	1—2	2—3	3—4	4—5	0—5	5—10	0—10	All other Ages.	
The whole Colony	2·79	0·52	0·25	0·17	0·14	3·87	0·38	4·25	9·53	13·78
Hobart Registration District	3·72	0·75	0·27	0·21	0·19	5·14	0·43	5·58	14·92	20·49
Launceston ditto	4·43	1·02	0·27	0·16	0·23	6·11	0·50	6·61	16·64	23·26
Urban Districts	3·95	0·84	0·27	0·19	0·20	5·45	0·46	5·91	15·48	21·39
Extra-urban or Rural ditto	2·10	0·33	0·23	0·16	0·10	2·92	0·33	3·25	5·98	9·24

[H.]

PROPORTION OF DEATHS at each Age to 1,000 persons at each age living at the end of the year: average of 5 years, 1869-73.

Locality.	Age at Death.									
	0—1	1—2	2—5	3—4	4—5	0—5	5—10	0—10	All other Ages.	All ages.
The whole Colony.........	95·66	19·70	6·28	—	—	26·78	2·57	14·56	13·46	13·78
Hobart Regis. District....	133·52	31·63	8·14	—	—	38·33	2·95	19·76	20·78	20·49
Launceston ditto.........	155·37	39·75	7·83	—	—	44·12	3·47	23·39	23·20	23·26
Urban Districts...........	140·77	34·42	8·04	—	—	40·26	3·12	20·95	21·57	21·39
Extra-urban or rural ditto	70·32	12·00	5·34	—	—	19·50	2·25	10·94	8·51	9·24

[I.]

POPULATION AT EACH AGE, according to the proportions obtaining at the last Census: average of 5 years, 1869-73.

Locality.	Age at Death.									
	0—1	1—2	2—5	3—4	4—5	0—5	5—10	0—10	All other Ages.	All ages
The whole Colony............	2957	2681	9010	—	—	14,649	14,946	29,595	72,143	101,738
Hobart Regis. District......	713	607	2113	—	—	3,433	3,792	7,225	18,385	25,610
Launceston ditto.............	354	317	1047	—	—	1,718	1,788	3,506	8,895	12,401
Urban Districts...............	1067	924	3160	—	—	5,151	5,580	10,731	27,280	38,011
Extra-urban or rural ditto	1890	1757	5850	—	—	9,498	9,366	18,864	44,863	63,727

[K.)

PROPORTION OF PERSONS AT EACH AGE to 100 persons at all ages, as above.

Locality.	Age at Death.									
	0—1	1—2	2—5	3—4	4—5	0—5	5—10	0—10	All other Ages.	All ages
The whole Colony............	2·91	2·63	8·86	—	—	14·40	14·69	29·09	70·91	100·00
Hobart Regis. District......	2·78	2·37	8·25	—	—	13·40	14·81	28·21	71·79	100·00
Launceston ditto............	2·85	2·56	8·44	—	—	13·85	14·42	28·27	71·73	100·00
Urban Districts...............	2·81	1·46	8·34	—	—	13·62	14·61	28·24	71·76	100·C0
Extra-urban or rural ditto	2·96	2·76	9·18	—	—	14·90	14·70	29·60	70·40	100·00

[L.]

PROPORTION OF POPULATION AT EACH AGE, PER CENT. TO TOTAL POPULATION, ACCORDING TO CENSUS OF 1871.

Countries.	Age.										
	0—1	1—2	2—3	2—5	3—4	4—5	0—5	5—10	0—10	All Others	60 and upwards.
Tasmania (February, 1870)	2·91	2·63	—	8·86	—	—	14·40	14·69	29·09	70·91	6·64
Victoria	3·34	3·02	3·28	—	3·25	3·05	15·94	14·55	30·39	69·61	2·75
New South Wales	3·59	3·16	3·25	—	3·27	2·99	16·26	13·99	30·25	69·75	3·97
South Australia	3·38	3·31	3·52	—	3·52	3·21	16·94	15·37	32·31	67·69	3·48
Queensland	3·86	3·45	3·60	—	3·40	3·32	17·63	12·16	29·79	70·21	1·63
England and Wales (1861)	2·96	2·71	2·67	—	2·57	2·55	13·46	11·68	25·14	74·86	7·44
Scotland	3·00	2·60	2·70	—	2·66	2·58	13·54	12·05	25·59	74·41	8·11

NOTE.—The calculations have been made on the whole population, including those persons whose ages were "unspecified."

[M.]

NUMBER OF BIRTHS AND DEATHS OF INFANTS UNDER ONE YEAR IN TASMANIA.

Locality.	Births.					Deaths.				
	1869	1870	1871	1872	1873	1869	1870	1871	1872	1873
The whole Colony	2859	3054	3053	3013	3048	289	298	260	306	266
Hobart Regis. District	769	724	773	718	725	100	92	86	112	86
Launceston ditto	405	482	439	408	395	60	53	51	52	59
Urban Districts	1174	1206	1212	1126	1120	160	145	137	164	145
Extra-urban or Rural ditto	1685	1848	1841	1887	1928	129	153	123	142	121

[N.]

NUMBER OF DEATHS.—The Whole Colony.

Year.	Age at Death.										Population at all Ages.
	0—1	1—2	2—3	3—4	4—5	0—5	5—10	0—10	All other Ages.	All Ages.	
1869...	289	46	26	13	14	388	44	432	903	1335	99,000*
1870...	298	46	26	20	19	409	45	454	950	1404	100,765
1871...	260	45	21	18	8	352	28	380	975	1355	101,785
1872...	306	61	31	14	10	422	33	455	956	1411	102,925
1873...	266	67	23	22	19	397	43	440	1064	1504	104,217
Sum..	1419	265	127	87	70	1968	193	2161	4848	7009	508,692
Mean.	283·8	53·0	25·4	17·4	14·0	393·6	38·6	432·2	969·6	1401·8	101,738

Urban Districts (Hobart and Launceston).

Year.	Age at Death.									
	0—1	1—2	2—3	3—4	4—5	0—5	5—10	0—10	All other Ages.	All Ages.
1869......	160	27	14	5	4	210	20	230	537	767
1870......	145	24	8	9	10	196	11	207	567	774
1871......	137	28	10	6	7	188	13	201	604	805
1872......	164	44	9	9	5	231	13	244	576	820
1873......	145	36	11	8	12	212	30	242	658	900
Sum.....	751	159	52	37	38	1037	87	1124	2942	4066
Mean....	150·2	31·8	10·4	7·4	7·6	207·4	17·4	224·8	588·4	813·2

* Assumed as the population on 31st December, 1869, the number by census on 7th February, 1870, being 99,328.

Hobart Registration District.

Years.	Age at Death.										Population.
	0-1	1-2	2-3	3-4	4-5	0-5	5-10	0-10	All other Ages.	All Ages	
1869...	100	15	8	3	2	128	14	142	335	477	24,921
1870...	92	14	5	7	6	124	8	132	372	504	25,365
1871...	86	19	6	4	4	119	7	126	388	514	25,622.
1872...	112	25	8	8	4	157	8	165	380	545	25,909
1873...	86	23	8	5	8	130	19	149	435	584	26,234
Sum..	476	96	35	27	24	658	56	714	1910	2624	128,051
Mean.	95·2	19·2	7·0	5·4	4·8	131·6	11·2	142·8	382·0	524·8	25·610

Launceston Registration District.

Years.	Age at Death.										Population.
	0-1	1-2	2-3	3-4	4-5	0-5	5-10	0-10	All other Ages.	All Ages	
1869...	60	12	6	2	2	82	6	88	202	290	12,100
1870...	53	10	3	2	4	72	3	75	195	270	12,275
1871...	51	9	4	2	3	69	6	75	216	291	12,399
1872...	52	19	1	1	1	74	5	79	196	275	12,538
1873...	59	13	3	3	4	82	11	93	223	316	12,695
Sum..	275	63	17	10	14	379	31	410	1032	1442	62,007
Mean.	55·0	12·6	3·4	3·4	2·8	75·8	6·2	82·0	206·4	288·4	12,401

Extra-Urban or Rural Districts.

Years.	Age at Age.										Population.
	0-1	1-2	2-3	3-4	4-5	0-5	5-10	0-10	All other Ages.	All Ages	
1869...	129	19	12	8	10	178	24	202	366	568	61,979
1870...	153	22	18	11	9	213	34	247	383	630	63,125
1871...	123	17	11	12	1	164	15	179	371	550	63,764
1872...	142	17	22	5	5	191	20	211	380	591	64,478
1873...	121	31	12	14	7	185	13	198	406	604	65,288
Sum..	668	106	75	50	32	931	106	1037	1906	2943	318,634
Mean.	133·6	21·2	15·0	10·0	6·4	186·2	21·2	207·4	381·2	588·6	63,727

[O.]

DEATHS IN TASMANIA FROM TYPHOID AND TYPHUS FEVER AND DIPHTHERIA.

	Typhoid and Typhus Fever.		Diphtheria.	
	1874.	1875.*	1874.	1875.*
Bothwell	...	...	...	...
Brighton	...	2	...	6
Campbell Town	...	3	...	1
Clarence	...	...	...	...
Deloraine	...	...	1	2
Emu Bay	1	3	...	...
Esperance	...	...	...	...
Fingal	1	1	...	...
Franklin	1	1	...	4
George Town	...	...	...	1
Glamorgan	...	...	...	...
Gordon	...	...	...	1
Green Ponds	...	...	...	...
Hamilton	...	...	9	1
Hobart	4	13	8	17
Horton	...	...	...	...
Kingston	...	...	1	...
Launceston	3	1	12	5
Longford	...	...	3	1
Morven	...	...	...	...
New Norfolk	1	...	1	1
Oatlands	...	...	2	3
Port Cygnet	...	...	...	...
Port Sorell	...	1	...	...
Ralph's Bay	...	...	...	...
Richmond	4	...	...	1
Ringarooma	...	...	...	...
Sorell	4	3	...	6
Spring Bay	...	...	...	...
Tasman's Peninsula	...	...	...	...
Ulverstone (forming part of Port Sorell)	...	...	...	1
Victoria	...	...	...	...
Westbury	1	...	...	...
	20	28	37	51

* Hobart to date: Launceston to 30th June: other Districts to 30th September.

OUR GRASSES (QUEENSLAND).

BY F. M. BAILEY, Brisbane, Corr. Member Royal Society Tasmania.

[Read 12th October, 1875.]

However loth some may be to allow it, the foundation of this country's wealth lies in these plants. In old writings, as well as those of the present day, many plants are called grasses which do not belong to the Order called *Gramineæ* by botanists, but this order in its restricted sense is of the whole vegetable kingdom that most useful to man, and we also find it the most widely spread of *Phænogamous* plants, covering the face of the globe, producing food for man and beast from the poles to the equator. The numbers of species also are very great, and with regard to size, while many attain but the height of a few inches, there are some which rival that of forest trees. Much might be said of the various uses to which this valuable family is applied, but all attempted in this paper is to draw some little attention to our pasture grasses. As only those known to the writer are noticed, doubtless a large number of species are left for further observation, while from those mentioned an idea of the richness of Queensland pasture can be formed. I have endeavoured to arrange the species more with regard to their general habitat than to natural affinity, which I think will be an advantage to persons who may wish to collect seeds of the species under notice for the purpose of proving under cultivation their real value.

Let us notice in the first place a few of our grasses which may be termed Aquatic species, for they are generally found in swamps or along water-courses. *Leersia Australis* of Robt. Brown, which the learned botanist of Victoria, Baron von Mueller, who of late has given much attention to this order of plants, finds to be identical with Swartz's *L. hexandra*. It is the species most generally met with;a quick growing productive grass. It seems to be well relished by cattle. It is also botanically interesting on account of having six stamens, being double the number of male organs usually found in the grasses. *Poa aquatica*, *L.* the water-meadow grass, may be often met with on our marsh lands; this is a fine succulent grass and crops well, but cattle are apt to pull it up, and thus prevent it from producing seed that otherwise it would do in abundance. *Panicum atrovirens*, Tri., may be met with in several of the creeks near Doughboy. It is one of the prettiest of our indigenous grasses, and promises a very fair amount of fodder and seed.

In most of our swamps will be seen a wiry growing grass with upright spikes of seed, to which many small birds seem partial; this is Robt. Brown's *Panicum phleoides*, but according to *Fragmenta Phytographiæ Australiæ*, Vol. viii., page 197, Baron von Mueller finds it identical with *Panicum indicum* of *Linnæus*. When introduced on to good land the wiry character is lost, and it forms a good sward.

Of all the species found on our low lands none equal for fodder a variety of *Panicum Crus Galli Linn. Echinochloa stagnina* of *Palisot de Beauvois ;* in its natural state it will be found in or around stagnant water of from 2 to 3 feet in height, but when cultivated it attains the height of 5 or 6 feet, the fodder being equal to any of the introduced *Sorghums*. *Panicum virgatum Linn.* is another species found along water-courses and in swamps; it produces a fine succulent fodder, but not equal to the last mentioned. This species is also common on the Darling Downs, where it is known as umbrella-grass.

Pennisetum compressum of R. Brown's Prod. This species forms large tufts of grass of a rather coarse nature. When in flower it will be easily recognised by its purple bottle-brush-like spikes. With this may be classed Robt. Brown's *Cenchrus australis*, a swamp and scrub grass, readily eaten by cattle until its burr-like seeds appear. The broad-leaved variety of this grass, found on the banks of the Pioneer River and other parts of Northern Queensland, is much more succulent, and produces a large quantity of coarse fodder.

* *Phragmites communis* Tri. The common reed is abundant along most of our rivers, and although not a fodder, still is useful for thatching, etc. *Andropogon muticus Steudel*. When fully grown this species becomes very harsh, but in the early stage of its growth it produces a fair quantity of feed ; entirely a swamp species. *Andropogon triticeus* R. Br., the tallest of all our grasses is only found within the tropics, where the flower stalks often stand 10 or more feet high, bearing several spikes of flowers resembling ears of wheat. This is the spear grass of the tropic, and is well named, for its awns are often 4 or more inches long ; it produces a large quantity of bottom feed, and is only found on rich land. The common blady grass* *Imperata arundinacea* of *Cyril*, one of the most frequently met with grasses on rich land, and indeed the commonest grass of the north, produces in a young state a large quantity of feed. On salt marshes or brackish land will often be seen a large quantity of the stiff harsh grass, **Hemarthria compressa* of Robt. Brown, although coarse, this kind produces a great deal of feed. In company with this another very superior species, *Sporobolus pallidus*, will often be seen keeping up a good sward until well on into the summer month, when it is generally overrun by Dr. Robt. Brown's *Paspalum littorale;* of

this there are two distinct varieties, the one being found near salt, the other near fresh water. This latter variety is perhaps the most succulent and beautiful of all our summer grasses, but neither are seen much of during the winter. According to Baron Mueller these two varieties are identical with an Indian grass *Paspalum distichum* of *Linnæus.*

I will next notice a few species generally to be met with on broken ground such as the borders of scrubs, banks of rivers, or similar situations, and here we shall doubtless find many that it would be well to introduce into the pasture lands. For instance, the beautiful *Poa chinensis* of *Kœnig*, which may be seen plentifully on the banks of Doughboy Creek and the Brisbane River, is a species well worth cultivating. It is easily known by its feather-like drooping panicle.

* *Stipa Dichelachne* of *Steudel* is also a valuable species, on account of its producing feed all the year round. It is a free seeder, and may be easily known by its upright, light colored panicle. The broad-leaved *Panicum foliosum*, R. Br., must not be looked over, for it is one of the best grasses on the river bank. * *Festuca Billardieri* of *Steudel*, a grass often found on the borders of scrubs is rather too harsh to recommend for fodder, although it seems to be liked by some persons on the Darling Downs. *Forster's Agrostis ovata, Cinna ovata* of *Kunth* is another harsh species common to our river banks, but which cannot be spoken of as a fodder grass. I shall speak of the bulk of our grasses under the name of pasture species, because if we notice a paddock cleared of its timber and rubbish, so that the natural grasses have a chance, they show themselves even on the very worst land—the ironbark forests for instance. In a marvellously short time the whole is covered with a luxuriant sward, thus proving all useful for pastoral purposes. But as there are some few kinds of grasses oftener met with in one situation than another, it will be well to note these. Thus there are a few species which we generally fall in with on the dry ridges, as the beautiful close-growing *Andropogon falcatus* of *Steudel*, which, from its compact dwarf growth and rich color, should recommend itself as a valuable lawn grass. Here we also find the prolific seed bearer, *Panicum brizoides* of *Linnæus.* The stalks of this grass are mostly prostrated by the weight of seed; in company with these will be found, especially on forest land, the sparsely-leaved upright growing *Panicum marginatum*, R. Br., and its nearly allied species, *Panicum strictum*, R. Br. This latter species is of a darker green, and not so hairy. *Panicum bicolor*, R. Brown, is another grass often met with on the dry ridges; and also all over the hills will be seen the fine pasture grass *Panicum parviflorum*, R. Br. Of this there are also two fine

varieties, the one with large spreading panicles, and the other having only one or two very long erect spikelets in its panicle. All three are well worth cultivating, and they will be easily recognised from the dark color of the small seeds. *Panicum tenuiflorum*, R. Br., has a running stem and broad leaf, and forms a good bottom. This species is easily known by its weak stalks, and two spikelets ; the seed also is of a light color. Two grasses, also common in ironbark forests, are *Aristida vagans* and *A. calycina.* According to Dr. Robt. Brown's *Prodromus*, these two grasses make a good bottom, although their stalks are dry and harsh. The terminal three awns to the seed distinguish the genus. And these two species may be known from each other, by the latter having a drooping panicle, and being of a lighter color than the former. In company with these will always be found the fine pasture grass, *Sporobolus elongatus*, Robt. Brown. This species is not confined to the hills, but is met with in all directions. This species has a very long narrow panicle. On the damp side of the hills will be met with during the greater part of the year, a very pretty grass ; the four stamens of the flowers will readily point the species out. This is Robt. Brown's **Microlæna stipoides*, also known by *Labillardier's* name, ** Ehrharta stipoides.* Here also will be found the handsome *Andropogon gryllus* of *Linnæus.* Trinius named it *Chryspogon gryllus*, from its golden beard. It is a useful fodder species. On the open hillsides our old friend, the kangaroo grass, *Anthistiria australis*, R. Brown, is met with in abundance, and in similar situations at the north will be found the **Anthistiria ciliata* of *Linnæus.* This species makes a much greater quantity of leaf. Brown's *Panicum decompositum*, which Baron Mueller finds identical with an American species, *Panicum capillare*, *Gronv.*, is a most productive grass, and is found pretty generally throughout the colony. *Panicum coloratum*, *Linn*; this is very similar to the last, but its large panicle is of a dark color. The well-known annual summer grass, *Panicum ciliare*, *Retz*, all will agree in pronouncing a most prolific species. The most common grass of our flat open country is *Andropogon refractus*, R. Br., a species that may be known by the spikelets being suddenly bent backwards as if broken. This is a fine productive summer grass, but little is seen of it during the cold months. The same may be said of the species commonly called blue grass, *Andropogon sericeus*, of Brown's *Prodromus*, and *Andropogon affinis*, R. Br. ; but *Andropogon pertusus*, *Willd.*, stands the cold much better, though somewhat similar to the two last named species ; this may be recognised at once by the little pit on the glume. *Panicum semialatum*, R. Brown, a very widely spread species, is an excellent pasture grass. The species is easily distinguished by its tall stalks, and two or three stout often colored spikelets; this species stands the winter pretty well. Another grass that will stand through the winter well is *Helopus annulatus*, *Nees*. There are two varieties of this fine grass, both equally good. This species is of a much lighter green than most others. **Agrostis solandri*, F. v. Mueller, is an early annual grass, and produces a large quantity of sweet herbage. This species is not very common about Brisbane, but is plentiful on strong wet land, as Darling Downs. *Brown's Poa parviflora* is an annual grass found springing up in all directions, producing a sweet tender herbage at most seasons of the year. It is the light panicles of these two, and the next species, that are often seen sticking to fences in summer. *Chloris divaricata*, R. Br., the common star grass, is an early quick growing species, which, although its flower stalks may look dry, nevertheless produces a large quantity of leafy feed at bottom. The couch *Cynodon Dactylon*, *Pers*, which is found following the footsteps of both squatter and farmer must not be overlooked, but being so well known it is needless to do more than just mention it. *Eleusine indica Gærtn* is a strong growing succulent summer fodder in the Brisbane district, but further north it is stated to form a good permanent pasture. The species may be recognised by its deep green color, strong stalks, with star-like panicle the spikelets of which are flat and broad. Equal to the last with regard to summer produce, is *Brown's Paspalum orbiculare*, and it must be reckoned a superior species, for it possesses the advantage of growing through our winter months. This species is mostly met with on rich alluvial flats in company with another fine grass, *Sporobolus indica*, R. Br. The growth of this is rather tufty, somewhat similar to **Poa cæspitosa*, a grass often found with it, but from which it may be readily known by its close spike-like panicle. In similar situations we may often meet with large patches of *Andropogon montanus Roxb.*, a very coarse grass, which does not seem to be much relished by cattle. *Andropogon acicularis*, and *A. contortus*, *Linn.*, are two good fodder species, but the spear-like seeds of the latter species makes it troublesome to sheepfarmers. Two other grasses are also an annoyance in the same way, *Lappago racemosa Schreber*, by its burr-like seeds; and also the common speargrass, *Streptachne stipoides*, R. Br., although this latter species is one of the best fattening sorts before its seeds are ripe.

As there are a few of our native grasses which stand a deep shade, it may be well to notice them, for although they cannot be recommended as fodder species, yet they have their value for ornamental purposes. Thus under the close shade of our

Casuarina trees, and in the dense scrubs the small grass, *Panicum pygmæum*, R. Br., will be found, forming a soft thick carpet in its natural state. It is not much relished by stock, but if grown on open country it would doubtless prove a valuable species for some lands. In company with the above a much more delicate species will often be seen, perhaps a variety of *P. pygmæum.* Robt. Brown's two species of *Orthopogon*, *O. compositum* and *O. imbecillis*, are great shade lovers, and may be often met with on the sides of hills; the genus will be at once recognised by its straight beard.

The wheat-like *Danthonia*, *D. triticoides Lindley*, and *Sclerachne cyathopoda* of F. von Mueller, two grasses from the north of Queensland, are highly spoken of as fodder species. On the Darling Downs, generally spoken of as the richest pasture lands of the colony, there are a few species of grasses that seem peculiar to the locality. Therefore it will be as well to notice them as Down grasses. The Downs Oat-grass, *Anthistiria avenacea*, of Baron Mueller, is one of the most productive grasses of Australia. Like all other kinds of kangaroo grasses, this produces a large amount of bottom fodder, but it also has the advantage of being a prolific seeder.

The Black or Brown-topped grass is next in importance to the Oat. This, Dr. Brown's *Saccharum fulvum* (*Erianthus fulvus*, *Kunth*), is a sweet grass, of which stock are so fond, that they actually eat it down so close as to cause it to die out.

The Bamboo grass *Stipa ramosissima*, *Sieber*, although a very coarse hard species, is by some highly spoken of as a horse fodder. The larger masses of fine grass, produced at the nodes of the stems, makes this species easy of recognition.

Pennisetum glaucum, R. Br., is a fine fodder grass, and well worthy of cultivation. The same may be said of Baron Mueller's *Panicum cœnicolum*; this species is in appearance very like *Panicum divaricatissimum*, a grass found along the Brisbane River. The White-topped grass, **Danthonia penicillata*, F. v. M., the Umbrella grass, *Aristida ramosa*, R. Br., and *Pappophorum commune*, F. v. M., are three kinds peculiar to the districts, and by some spoken well of, but they seem, from the specimen before me, to be of a rather dry nature. The following grasses have become naturalised in our pastures :—

The well-known Prairie Grass, *Bromus unioloides H.B.* and *Kunth*, is an excellent grass,producing a fine winter fodder, and plenty of seed. The Guinea grass, *Panicum maximum*, Jacq., a most valuable fodder, stands cutting well. The Buffalo grass, *Stenotaphrum Americanum*, Schrad. This is a very fine and desirable species, and cannot be too highly spoken of;

besides being a fine pasture grass, it is also valuable for holding together loose banks of rivers and creeks. To these may be added *Poa annua* and *Poa pratensis*, with also the pretty little *Briza minor*. As it is in the winter months, say June and July, that the pasture is at its worst in Queensland, I shall next notice a few of the best species at that season.

The introduced Prairie Grass, *Bromus unioloides*, keeps up a good growth until about the end of September. This grass is only found on the rich land along rivers, &c. *Poa annua* will be found pretty generally scattered over our ridges.

The Blady grass, **Imperata arundinacea*, where the old has been burnt off during the summer, produces a large amount of sweet feed. *Paspalum orbiculare*, when close fed, is a most valuable winter grass, but if let to get old cattle refuse it.

The Old Kangaroo grass, *Anthistiria australis*, a fine grass in all seasons, is one of our best winter species.

Helopus annulatus. This grass, like the above, produces all the year round.

Though delicate looking, * *Microlena stipoides* produces a large quantity of feed on our damp hill-sides during winter. And the swamps are also covered at this season with *Leersia hexandra*.

On the rich alluvial soils bordering our rivers, *Sporobolus indicus* and *S. diander*, produce abundant feed.

Andropogon refractus, although a species which does not like cold, yet where there is good shelter, is a good species for forest land, even in winter. The same may be said of *Panicum bicolor*, *P. parviflorum*, *P. marginatum*, and its variety *strictum*, all good forest grasses. *Andropogon falcatus*, a valuable lawn grass, is also a good winter species. Doubtless this list might be extended much further, but enough are noticed to show that even in our worst time the pasture of Queensland is good.

Before closing this paper, it may be well to notice those grasses which seem more susceptible than others to the parasitical fungus *(Ergot)*. The following are the species I have usually noticed infested :—*Sporobolus elongatus*, *T. indicus*, *S. diander*, *Paspalum orbiculare*, and *Leersia hexandra*. I may here notice that one of our common sedges, a small *Fimbristylis*, is at times very bad with an ergoty fungus. May it not be this, which at times poisons sheep, and not the too often condemned flowering shrubs?

F. M. BAILEY.

Brisbane, Queensland,
September, 1875.

Note.—The foregoing paper was read by the Rev. J. E. Tenison Woods, who marked thus * the species indigenous to Tasmania.

DESCRIPTION OF NEW TASMANIAN SHELLS.

By the Rev. J. E. Tenison Woods, F.L.S., F.G.S.

[*Read 8th November,* 1875.]

The following marine shells have been placed at my disposal for description by Mr. W. Legrand, of Hobart Town, and the Rev. H. D. Atkinson. Mr. Legrand, who has one of the finest collections of shells in the southern hemisphere, has been a collector for years, and has become thoroughly familiar with the marine fauna of our coast. Mr. Atkinson has occupied himself with dredging for some years, and has been the only conchologist who has sought for novelties in that way in Tasmania. He has also been indefatigable in his efforts to advance the success of conchology in the Island, and it is owing to his efforts alone that some of the very interesting species here described have been brought to light. I also observed two new species from a small collection placed in my hands by Mr. Justin Browne and the Curator of the Museum, Mr. Roblin. To all these gentlemen I take this opportunity to return my thanks.

In this list the measurements are always the greatest length, width, or height, as the case may be. In bivalves length means in every case from the umbones to the margin; width the greatest measurement in the opposite direction; and height the thickness of both valves united. All dimensions in French millimetres.

Pisania tasmanica *n. s. P. t. fusiformi-elongata, alba, nitente, liris transversalibus subtillissimis, plicisque minutis, rotundatis, subdistantibus, creberrime cancellata; anfractibus 7, convexis, declivis, ad suturam constrictis, varicibus eburneis, sub-obsoletis, ornatis; apertura ovali, labro eburneo, incrassato; labio vix calloso.* Long. 20. Lat. 7. Aper long. 7.

P. shell fusiformly elongate, white, shining, very thickly cancellate, with very fine transverse liræ and small rounded, subdistant plaits; whorls 7, convex, sloping, constricted at the suture, ornamented with ivory white sub-obsolete varices; aperture ovate, outer lip ivory white, thickened; inner lip scarcely callous.

Rare, D'Entrecasteaux Channel. It was not without difficulty that I separated this species from *P. reticulata,* which it resembles in every respect, except that it is very much smaller, shining white, with two or three regular varices on each whorl. There are no varices in *P. reticulata,* and none are noticed by A. Adams (Zool. Proc. 1854, p. 138, sp. 39), whose description is hardly sufficiently detailed. In old specimens of that shell the cancellated structure causes the plaits to be very granular, and it is a dull shell of a purple brown color, but young specimens are more livid, and faintly banded with chestnut.

Purpura littorinoides, n.s. *P. t. acuminato-ovata, viridescenti alba; spira elata, acuminata, mamillata; anfractibus 6, angulatis et supra bicarinatis, liris transversalibus, rotundatis (interstitiis aequantibus) et squamatis, lamellis longitudinalibus, imbricatis cancellatis; apertura acuté ovata, intus atro-violascente tincta; labio sub-planato, partim atro-violacea encausto; labro vix crenato.* Long. 15. Lat. 8.

P. shell acuminately ovate, greenish white, spire produced acuminate, mamillate; whorls 6, angulate and bicarinate above, with tranverse rounded liræ (equalling the interstices in width), and cancellated with scaly imbricate lamellæ; aperture acutely ovate, stained deep blackish purple within; inner lip somewhat flattened and partly enamelled, blackish purple; outer lip slightly crenulate. Long Bay, Southport, common.

This shell approaches in habit the *P. Flindersi* of Adams, and Angas, but it is much smaller and more like a Littorina, while the other resembles a Trophon. Its deep violet black mouth is very characteristic. *P. Flindersi* has a violet mouth, but very much paler and clouded.

Trophon umbilicatus, n.s. *T. t. ovata, lutea vel pallide castanea, solida; spira elata, anfrac 5-6, superne angulatis et concavis, conspicue longitudinaliter plicatis (ult. anfr. 8) et transversim conferte liratis, liris magnis et parvis alternantibus, magnis planatis, et supra plicas squamato-imbricatis; squamis post columellam validis, elevatis, canaliculatisque; ad suturas costis lirisque obsoletis; labro extus crenato intus dentato; labio columellari expanso; umbilico squamis imbricatis, rotundatis marginato.* Long. 27. Lat. 15.

T. shell ovate, yellow or pale chestnut, solid, spire raised; whorls 5-6, angulate above and concave, conspicuously plicate lengthwise (8 in the last), and transversely thickly lirate, liræ alternating large and small, the larger flattened, squamately imbricated over the plaits; squamæ behind the columella valid, raised and canaliculate; at the sutures, the plaits and liræ obsolete; outer lip crenulate outside and toothed within; columella lip expanded, umbilicus margined with rounded imbricated scales.

Rather uncommon, East Coast. At one time I considered this a Tasmanian variety of *T. Hanleyi*, Ang. but a comparison of many specimens shows me that the present is an entirely different shell, very much more scabrous. The umbilicus and its margin are also peculiar and distinct.

Trophon clathratus, *n.s. T. t. parva, fusiformi, turrita, fulva; spira acuminata; anfractibus 8, convexis, declivibus, validis, longitudinaliter costatis, costis rotundatis, subdistantibus, liris distantibus, elevatis, clathratis; apertura lata, intense rufo fulva (fasciata ?), labro tenui; canali subelongata recurvo.* Long. 9. Lat. 4.

T. shell small fusiform, turretted, brownish; spire acuminate ; whorls 8, convex, sloping, validly ribbed lengthwise, with rounded sub-distant ribs, and latticed with elevated distant liræ; aperture wide, of deep reddish brown (doubtfully banded) ; outer lip thin, canal subelongate and recurved.

Rare, Bass Straits ? A small very conspicuously latticed and turretted shell, in every way distinct from those previously described, which have no valid transverse liræ. It might be mistaken for a Clathurella, but that it has a true Trophon mouth and canal.

TROPHON BRAZIERI, *n.s.* *T.t. parva, ovata, fusiformi, utrinque attenuata, sordide alba, spira subturrita, quasi acuta, mamillata, anfractibus 7, costulato-varicosis, lævigatis vel tenuissime striatis, ultimo anfractu varicibus sex, rotundatis, distantibus, medio convexis; apertura ovata, encausta, fauce castanea, labio tenui, intus indistincte spiraliter fulvo-fasciata; columella antice subtuberculato; canali subelongato recurvo.* Long. 10. Lat. 5 mil.

T. shell small, ovately fusiform, attenuate at both ends, sordidly white, spire sub-turretted, almost acute, mamillate ; whorls 7, with rib-like varices, smooth or finely striate, last whorl with six, rounded, distant varices, which are convex in the middle, aperture ovate, enamelled ; mouth chestnut ; outer lip thin, indistinctly brown banded within ; columella subtuberculate anteriorly ; canal sub-elongate, recurved.

Long Bay, rather common, small, the enamelled chestnut mouth and narrow form easily distinguish it.

TROPHON GOLDSTEINI. *T.t. abbreviato-fusiformi, lamelloso-varicosa, sordide alba, spira subturrita; anfractibus 8, convexis, supernè angulatis et coronatis, liris substantibus, subelevatis (ult. anfrac. 4, duobus basim versus inter varices obsoletis), transversim cinctis; liris supra varices non transeuntibus; varicibus antice squamosis, flexuosis; apertura ovata, intus encausta, castanea et fulvo-fasciata; labro varicoso; columella contorta; canali contorto et flexuoso.* Long. 16. Lat. 8 mil.

T. shell abbreviately fusiform, lamellosely varicose, sordidly white, spire sub-turretted ; whorls 8, convex, angulate and coronate above, girdled transversely with distant sub-raised liræ (in last whorl 4, the two towards the base between the varices obsolete), liræ not passing over the varices, which are anteriorly squamose and flexuous ; aperture ovate, enamelled and chestnut brown banded within ; outer lip varicose ; columella twisted ; canal twisted and flexuous.

Long Bay, a very pretty lamellose Trophon which I have dedicated to an old and most painstaking fellow labourer in Australian Conchology, Mr. J. R. Y. Goldstein, of Warnambool, Victoria.

TROPHON AUSTRALIS, *n.s.*, *T.t. ovata, utrinque acuminata, sordida, viridescenti: anfractibus 6, convexis superne angulatis, obsolete long. costatis; et transversim tenuiter liratis; ultimo anfractu costis 10,* *antice cranidis; spira acuta; apertura ovata; labro tenui; columella planata; canali longiusculo paulatim recurvo.* Long. 16. Lat. 9.

T. shell ovate, acuminate at each end, sordidly greenish; whorls 6, convex, angular above, obsoletely ribbed lengthways, and finely tranversely lirate; ribs on last whorl 10, vanishing anteriorly; spire acute; aperture ovate, outer lip thin; columella flattened; canal somewhat long and slightly recurved.

Long Bay, rare, Rev. H. D. Atkinson, a more globose form than any except *T. Hanleyi*, Angas, of which it is about one-half the size, and in no way scabrous, the ribs being very indistinct.

Fusus spiceri, *n.s.*, *F.t. elongata, turrita, solida, rufo-castanea vel lutea, striis lævibus transversalibus (alternantibus parvis et maj.) et costulis undulatis longitudinaliter obsolete plicata; spira (sæpé contorta) superné sensim attenuata; apice mamilata vel decollata; anfr. in medio rotundatis; apertura ovata, canali longiusculo, recto, terminato; labro simplici tenui; labio inconspicuo ad suturam tenuiter canaliculato, columella encausta.* Long. 25. Lat. 9. · Anf. 8.

F. shell elongate, turretted, solid, reddish chestnut or yellow, cancellate, with smooth transverse striæ (large and small alternating), and undulating longitudinal lines; obsoletely plicate, lengthwise; spire (which is often contorted), gradually attenuated above; apex mamillate or decollate, whorls rounded in the middle; aperture ovate, terminated by a somewhat long straight canal; outer lip, simple, thin; inner lip inconspicuous, slightly channelled at the suture; columella enamelled.

King's Island, somewhat common. W. Legrand.

Fusus legrandi, *n.s.* *F.t. subelongata, fusiformi, fulvo-fusca, solidiuscula; anfractibus 7, subdeclivis, longitudinaliter plicato-costatis, in ultimo anfr. obsoletis; spiraliter liratis; liris albis, rotundatis, maj. et min. aliquando (speciatim ult. anfrac.) alternantibus, superné obsolete muricatis; interstitiis epidermidé, subsquamosis, tenuissimeque clathratis; sutura constricta; apertura pyriformi-oblonga; columella plano-concava; labro tenui, intus lirato.* Long. 38. Lat. 15. Apert. et can. 23.

F. shell subelongately fusiform, brownish yellow, somewhat solid; whorls 7, a little sloping, with longitudinal plicate ribs, which are obsolete in the last whorl; spirally lirate with white elevated rounded liræ, which sometimes, especially in the last whorl, are large and small alternately and obsoletely muricate above; latticed in the interstices with a somewhat scaly, very thin epidermis; suture constricted, aperture pyriformly oblong; columella flatly concave; outer lip thin and lirate within.

Rare, East Coast. Mr. Legrand tells me that this species seldom exceeds the dimensions given. It is very different from *F. Tasmaniensis*, Ad. and Ang. which is pyriform. Its nearest representative is *F. muricatus* Montague (in *Testacea Britannica* as *Murex m.*), but in that species the costæ are much more distinct.

SIPHONALIA CLARKEI. *S. testa parva, turrita, subfusiformi, livida; maculis rufo-fuscis sub peripheriam ornata; anfractibus (6), declivis, superné angulatis, regione suturali concava; costis radiantibus, (in ult. anfr. 12) obtusis, rotundatis, infra obsoletis, interstitiis concavis costis paulo superantibus; lirulis spiralibus superné et supra costas obsoletis; canali brevi, vix curvato; apertura ovata; labro intus dentato; labio inconspicuo.* Long. 27. Lat. 9.

S. shell small, turretted, sub fusiform, livid (or brown—it varies in color much as *Columbella semiconvexa*) with reddish brown spots under the periphery; whorls sloping, angulate above, and concave at the suture; radiately ribbed (ribs 12 in last whorl) ribs obtuse, rounded, obsolete below, and narrower than the interstices, spirally lirate; liræ obsolete above and on the ribs; canal short sloping, but scarcely curved; aperture ovate; labrum toothed within; lip inconspicuous.

From the very full and concise descriptions of *Siphonalia fuscozonata*, by Mr. Angas "Zool. Proc. 1865," p. 56, our only Australian species, I am able to pronounce this species distinct and new. It is much larger, the ribs more numerous, the color livid instead of white, and the liræ obsolete or absent, and lip toothed within. The brown spots are often deeply shaded at the summit of the ribs, and form a kind of fascia on the upper whorls. The labrum is often thickened into a kind of varix. At Long Bay, D'Entrecasteaux Channel, Legrand and Atkinson.

I have dedicated this interesting species to my dear friend and fellow labourer, the Rev. W. B. Clarke, F.G.S., &c, so long and eminently connected with the history of Australian geology.

SIPHONALIA TURRITA, *n.s. S.t. fusiformi-elongata, castanea vel livida; superne maculis rufo-fulvis zonata, posticé lineis subtillissimis punctatis rufo-castaneis cincta; spira elata, costata; anfractibus 7, convexis; ultimo obsoleté nodoso-costato; apertura ovata, intus maculata et fasciata, fasciis interuptis; labro acuto; labio concavo; canali obliqué elongato.* Long. 16. Lat. 7.

S. shell fusiformly elongate, chestnut or livid, zoned above with reddish brown spots, and posteriorly girdled with very fine lines of reddish chestnut points; spire elevated, ribbed; whorls 7, convex, last obsoletely nodosely ribbed; aperture ovate, spotted and banded with interrupted color within; outer lip acute; inner lip concave; canal obliquely elongated.

Long Bay, rare, Coll. Legrand. A shell very closely resembling *S. clarkei*, but more fusiform with a longer canal, and the last whorl nearly smooth, as the ribs are almost obsolete. The spire is also much turretted, and the outer lip thin and not dentate. The lines of minute dots are also peculiar. Inside the upper zone of spots appears as a series of longitudinal lines of a nut brown color.

Cominella tasmanica, *n.s. C.t. ovato-acuta, solidiuscula, in apicé acuta, alba, interdum virescenti et obscuré fasciata, spira costata et mamillata; anfractibus 8, convexis, superné subcanaliculatis, lirisque elevatis cinctis, striis longitudinalibus subtilioribus cancellatis; apertura acuté ovata; labro simplici tenuis, expanso, obsoleté lirato; labio encausto, canali paullulum curvato.* Long. 30. Lat. 17. Long apert. 15. Lat. 8.

C. shell ovately acute, somewhat solid, with acute apex, white, sometimes greenish and obscurely fasciate; spire costate and mamillate; whorls 8, convex, subcanaliculate above, encircled with liræ and cancellated with very fine longitudinal striæ; aperture acutely ovate; outer lip simple, thin obsolete, lirate, inner lip enamelled; canal slightly curved, Long Bay. Not uncommon. Rev. H. D. Atkinson, W. Legrand. This characteristic Cominella is distinguished from *C. costatum* by being double the size; its distinct raised liræ, the absence of any costæ on the last whorl and the color.

Cerithiopsis atkinsoni, var. A very distinct variety of Mr. Angas's *C. crocea* (P.Z.S. 1871 p. 16). It is larger and narrow, of sordid yellow color, instead of orange, and the ribs are not equal, the lower being small. It has however, the fine longitudinal striæ between the ribs. Dredged by the Rev. H. D. Atkinson in Long Bay, 10 fathoms sand.

Conus tasmanicus. n.s. *C.t. parva, subpyriformi-turbinata, coronata, tenui, sub-inflata, levi, nitente, antice striis distantibus validis cincta; castanea, tribus lineis fulvo alboque maculatis oblique zonata; ad suturas conspicue albo-fulvo maculata; anfractibus 6, transversim rugosé striatis, labro tenui.*

C. shell small, subpyriformly turbinate, coronate, thin, subinflated, smooth, shining, with anterior valid distant striæ; chestnut, zoned with three white and fulvous spotted lines; conspicuously spotted with white and fulvous at the sutures, whorls 6, transversely rugosely striate, outer lip thin.

Very rare. Coll. W. Legrand. Quite distinct from any other Australian form by its color and small coronate habit.

Mitra tasmanica. n.s. *M.t. ovata, utrimque attenuata, badia, lineis luteo-albis bi-tri-fasciata; spira subelevata, acuminata; anfractibus 7, planulatis; longitudinaliter crebré costata, costis parvis, subobsoletis; liris transversalibus subtillissime cinctis; apertura angusta; columella quadriplicata.* Long. 13. Lat. 5. Long aperture 6½.

M. shell ovate, attenuate at both ends, brown, with two or three yellowish white transverse bands; spire subelevate, acuminate; whorls 7, flattened, thickly ribbed lengthwise with small obsolete ribs, and very finely girdled with transverse liræ; aperture narrowed; columella quadriplicate.

Rare, Coll. Legrand. The fine ribs are most prominent on the upper whorls. There is a shell very closely allied to this which I have marked as variety *a*, where the ribs are larger and continuous, and another variety where they are smooth, and the whorls coronate.

Mitra scalariformis. *n.s. M.t. parva fusiformi-turrita, pallide, lutea, linea albida indistincte zonata; spira acuta; anfractibus 7, rotundatis, eleganter crebré costatis, costis validis, æqualibus, rotundatis lævibus, nitentibus, antice in ult. anfr. evanescentibus; apertura latiuscula; labro tenui acuto; columella triplicata.* Long. 10. Lat. 4. Long aper. 4½.

M. shell small, fusiformly turretted, pale yellow, zoned with an indistinct white line; spire acute; whorls 7, rounded, elegantly thickly ribbed with valid equal smooth shining ribs, which disappear on the last whorl. Aperture rather wide, outer lip thin, acute, columella triplicate.

Long Bay, rather rare, Rev. H. D. Atkinson. A very pretty shell, the ribs and somewhat turretted spire give it a scalariform aspect. It is somewhat dull in color.

Mitra legrandi. *n.s. M. t. minuta, spira sub-turrita, tumida, translucente, nitente, rufo-fulva, alba et linea fulva tenui zonata; anfractibus 5, costatis, costis validis, rotundatis, nitentibus, apertura ovali, columella triplicata.* Long. 5. Lat. 2½. Long apert. 2½.

M. shell minute, spire sub-turretted, tumid, translucent, shining, reddish fulvous white, zoned with a slender fulvous line; whorls 7, ribbed with valid shining rounded ribs; aperture oval, columella triplicate.

King's Island, rare. A very small shell, varying somewhat in the shades of its coloring, and not unlike *M. tasmanica*, above described, except that its ribs are more permanent and larger in proportion to its size.

Mitra tereslæ. *n.s. M.t. parva oblongo-ovata, tenuiscula, nitente, subventricosa, badia, albida bifasciata; spira breviuscula, vix acuta; anfractibus 5, læribus tumidis, conspicué nitentibus, ad suturam tenuissimé canaliculatis; apertura ovata, intus bifasciata, columella triplicata.* Long. 7. Lat. 3½. Long apert. 3½.

M. shell small, oblong ovate, somewhat thin, shiny, subventricose, brown, with two whitish bands; spire somewhat short, scarcely acute, whorls 5, smooth, tumid, shining conspicuously, finely canaliculate at the suture, aperture ovate, bifasciate within, columella triplicate.

Rare, King's Island. A shining banded shell of the series of our *M. pica*, but much smaller. The coloring seems very persistent, and, therefore, the species not easily mistaken. I confess, however, that if this species could lose the white bands, and were to have the mouth lirate within, I should regard it as a variety of *M. scita*. I think the liræ are not persistent in the latter, and, therefore, the shell may be the same.

MITRA SCITA. *n.s.* *M. t. parva, ovata, nitente, undique intense badia, spira obtusé rotundata, apice mamillato; anfractibus 6, lævibus tumidis, sutura tenuiter impressa; apertura latiuscula, intus badia, lirata; columella triplicata.* Long. 8. Lat. $3\frac{1}{2}$. Long apert. $4\frac{1}{2}$.

M. shell small, ovate, shining, entirely pure deep brown; spire obtusely rounded, apex mamillated, whorls 6, smooth, tumid, suture finely impressed; aperture rather wide, brown within, lirate, columella triplicate.

King's Island, somewhat common. Coll. Legrand. Specimens which had been mixed with *M. teresiæ*. Very distinct from its size, and intense uniform coloring, though belonging to the series of which *M. badia* is a large representative.

MANGELIA ATKINSONI. *n.s.* *M. t. parva, ovata-fusiformi, tumidiuscula, alba, nitida, epidermidé ferruginea induta, lineis obtusé angulatis zonata; spira mamillata; anfractibus 6, costatis, costis validis (ult. anfr. 6) rotundatis; apertura ovata, superné acuta; labro acuto, labio simplici, replicato.* Long. 3. Lat. $\frac{2}{3}$ mill.

M. shell small, ovately fusiform, somewhat tumid, white, shining, clothed with a ferruginous epidermis; zoned with obtusely angular lines, spire mamillate, 6 whorls, ribbed, ribs valid, rounded (in the last whorl 6), aperture ovate, acute above; outer lip acute; lip simple replicate.

Rare, East Coast. Coll. Legrand. The minute angular zone on this shell is not easily seen even under the microscope, because of the ferruginous epidermis. This shell has been dedicated to the Rev. H. D. Atkinson, whose dredging operations have done so much to develop the knowledge of Tasmanian conchology.

CLATHURELLA PHILOMENA. *n.s.* *C. t. elongato-fusiformi, turrita, parva, nitente, alba, ad suturam pallidissime fulva fasciata; apice acuta, fulva; anfractibus 7, declivis, superné angulatis, convexiusculis, longitudinaliter plicatis; plicis costiformibus, rotundatis, regularibus ad suturas arcuatis, transversim liratis; liris supra plic. transeuntibus, distantibus; apertura ovali; labro incrassato, postice profunde sinuato; labio reflexo plus minusve fulvo tincto.* Long. 11. Lat. $3\frac{1}{2}$

C. shell elongately fusiform, turretted, small, shining, white, very palely white banded at the suture; apex acute, fulvous; whorls 7, sloping, angular above, somewhat convex, plicate, lengthwise, with rib like plaits, which are rounded regularly and bent at the suture; transversely lirate, liræ passing over the plaits; aperture oval; outer lip thickened and deeply sinuate posteriorly; inner lip thickened, more or less tinged fulvous brown.

A small, almost cylindrically turretted form, with the apex and base tinged brown, and banded. The well defined ribs give it a pretty sculptured appearance. Rather common. East Coast.

MANGELIA IMMACULATA. *a.s.* *M. t. fusiformi-turrita, alba, nitente, spira acuta; anfractibus 9, declivis, ad suturas canaliculatis ad angulum obsoleté tuberculatis, transversim obsoleté liratis; apertura ovali; labro tenui, sinu conspicuo; labio simplici, superné tuberculato.* Long. 17. Lat. 6.

M. shell fusiformly turretted, white, shining; spire acute, whorls 9, sloping; canaliculate at the sutures, angulate and obsoletely tuberculate above, transversely obsoletely lirate, aperture oval; outer lip thin; sinus conspicuous, lip simple, tuberculate above.

King's Island, rare. A white, somewhat elegant species, with a true Pleurotoma spire.

MANGELIA MEREDITHIÆ. *n.s.* *M. t. turrita, fusiformi, gracili, spira quam apertura longiore; nitente, diaphana, alba, fasciis pallide castanea creberimé cincta; anfractibus 6, declivis, superné angulatis et concavis, longitudinalter plicatis plicis opacis, nitentibus, distantibus, curvatis, ad suturam angulatis; interstitiis subtillissime striatis; striis ætate evanescentibus; apertura angusto ovali; labio simplici; labro extus sub-varicoso, intus lævi; margine acuto.* Long. 13. Lat. 5.

M. shell turrettedly fusiform, graceful, spire longer than the aperture, shining diaphanous white, very thickly girdled with pale chestnut bands; whorls 6, sloping, angulate and concave above, plicate lengthwise with opaque, shining, distant curved plaits, which are angulate at the suture; interstices very finely striate, striæ disappearing with age; aperture narrowly oval; lip simple, outer lip subvaricose outside, smooth within, margin acute.

Bass's Straits, moderately common. A very pretty porcellaneous shining shell, with the ribs distinct, and opaque white. It varies much in coloring, sometimes the chestnut bands are numerous, and of various shades and thickness, at others confined to a simple fascia at the sutures, or the shell is quite white and shining.

DRILLIA ATKINSONI. *n.s.* *D.t. accuminato-turita, fusca, spira acuta, apice mamillato; anfrac. 9, superné angulatis convexis, declivibus, long. costatis, costis parvis, distantibus, subacutis, ult. anfrac. 16, supra angulum et ad suturam validis et transversim tenuiter valide liratis, liris magnis et parvis alterantibus, elevatis, supra cost. transeuntibus et ibi subnodosis; apertura alba, late ovata; labro tenui, expanso, incurvo incrassato, intus lævi, postice profundé sinuato; labio planato, lævi.* Long. 13. Lat. 5.

D. shell acuminately turretted, dusky, spire acute, apex mamillate, whorls 9, angled above, convex, sloping, ribbed lengthwise with small distant subacute ribs (in the last whorl 16), which persist over the angle to the suture, transversely finely validly lirate, with small raised liræ, alternately large and small, which pass over the ribs, and there become subnodose; aperture white, broadly ovate; outer lip thin, expanded, incurved, thickened, smooth within, deeply sinuate behind, lip flattened, smooth.

Rare, Long Bay, dredged from a sandy bottom at 10 fathoms, Rev. H. D. Atkinson. A very pretty shell, finely sculptured, usually very well preserved.

TURRITELLA GRANULIFERA. *n.s. T. t. acuminato-turrita, crassiuscula, lutea superné et infra fulvo fasciata; anfractibus 12, confertim longitudinaliter striatis, striis undulosis; transversim unicarnatis, carina granulosa, et obsolete, infra et supra costatis; apertura subquadrata; labro in medio sinuato.* Long. 25. Lat. 8.

T. shell acuminately turretted, somewhat thick; yellowish, with brown bands above and below, whorls 12, thickly longitudinally striate, with undulating striæ; transversely one keeled; keel granulose and obsoletely ribbed above and below, aperture subquadrate; outer lip sinuate in the middle.

A very distinct species, with a granular keel, which is of rare occurrence in the genus. Port Arthur, somewhat common.

TURRITELLA ACUTA. *T. t. acutissime lanceolato-turrita, alba, ad basim acuta angulata et concava; anfractibus 15, planulatis, liratis; et longit. unduloso striatis; striis, sub-lamellosis; apertura oblique ovata.* Long. 30. Lat. 6.

T. shell very acutely lanceolately turretted, white, acutely angulate and concave at the base, whorls 15, flattened, 7 lirate and longitudinally undulately striate, with lamellar and very minutely dentate striæ; aperture oblique, ovate.

Long Bay, rare. Rev. H. D. Atkinson.

TRUNCATELLA TASMANICA. *n.s. T. t. decollata cylindracco-turrita, parva, tenui, nitente, pallida; anfractibus 5 (non decoll. 7) convexiusculis, plicis parvis sub-acutis, confertissime instructis (in ult. anfrac. 30-35) apertura pyriformis; superné angulata et sulcata; labro bimarginato sub-expanso, labio inflexo.* Long. 7. Lat. 3.

T. shell decollate, cylindrically turretted, small, thin, shining, pale fulvous, whorls 5 (if not decollate 7), somewhat convex, furnished very thickly with small subacute plaits (in last whorl 30-35); aperture pyriform, angulate and sulcate above; outer lip bi-marginate sub-expanded; lip reflected; peristome continuous.

Bass Straits, common. The plaits or ribs on the shell are very like those on most Scalaria. For my own part I think, it very difficult to distinguish the species from *T. teres, Pfr.*, *T. scalarina*, *T. Yorkensis*, and *T. Brazieri*, the last three of Dr. James Cox. These are all Australian, and, as I believe, varieties of one species. I, however, mark the Tasmanian variety as above for future investigators.

TENAGODUS WELDII. *n.s. T. t. volubilis laxa, tenuis, alba, diaphana, nitidula, lævigata infime flavescente; anfractibus circ. 6, obliqué subtillissime striatis; rima in anfractibus tribus primis clausis, deinde apertis, marginibus subundulatis, acutis; apertura basi emarginata, marginibus irregularibus, acutis, apice septo hemisphærico clauso. Long. 12. Diam. aperturæ 2 mil.*

T. shell loosely twisted, thin, white diaphanous, somewhat shining, smooth, yellow below; whorls about 6, obliquely finely striate; cleft, closed in the three first whorls, then open with subundulating acute margins, aperture emarginate at the base, margins acute, irregular, apex closed with a hemispherical septum.

East Coast, somewhat common. A thin very small shell, closely rolled together at the apex, and then rapidly unfolding. It differs from the *T. Australis*, not only in its very much smaller size, but also in the slit being entirely open without any small rounded foramina in the upper part. I have dedicated this interesting species to His Excellency the Governor, F. A. Weld, Esq., C.M.G. It may be a variety of *Thylacodes decussatus*, *Gmel.*, but that is much larger, and of delicate rose color.

EULIMA MICANS. *n.s. E.t. minuta, obtusé-turrita, paulo curvata, translucida, polita, albida, apice mamillato, anfract. 7, superné planatis lævissimis, penultimo rotundato, ultimo subinflato; apertura pyriformi; labro tenui producto, labio reflexo.* Long. 3. Lat. $1\frac{1}{2}$ mil.

E. shell minute, obtusely turretted, slightly curved, translucid, polished, whitish, apex mamillated, whorls 7, flattened above, extremely smooth, penultimate rounded, last subinflated; aperture pyriform, outer lip thin, produced; inner lip reflected.

Long Bay. A unique specimen of a very minute, very highly polished translucid Eulima.

TURBONILLA MARIÆ. *T. t. elongata, turrita, tereti, solidiuscula, opaca, lactea; anfractibus 12, vix convexis vel planulatis; costis numerosis, declivibus, crassis, rotundatis, lævibus; interstitiis inconspicuis, parvis, latitud. costis æquantibus; anfractu ultimo costis ad peripheriam vix obsoletis; basi lævi, nitenti, convexo; apertura ovali, postice angulata antice producto et everso.* Long. 10. Lat. 2.

T. shell elongate, turretted, terete, somewhat solid, opaque, milky white, whorls 12, scarcely convex, or flattened; with numerous thick, sloping, rounded, smooth ribs; interstices small, inconspicuous, equalling the ribs in width; last whorl with the ribs scarcely obsolete at the periphery; base smooth, shining, convex; aperture oval, angulate posteriorly, and anteriorly produced and everted.

King's Island, Bass Straits, common, closely resembling some species from Japan. Large for a Turbonilla.

TURBONILLA TASMANICA. *n.s.* *T.t., subulato-turrita, nivea, solidiuscula; anfractibus normalibus 8, rotundatis, suturis impressis; costis elevatis, rotundatis, nitentibus, subconfertis, interstitiis lævibus; costis in ult. anfr. desinentibus; apertura ovata; anticé incrassata, 2 anfr. apicalibus inflatis, lævibus.* Long. 7. Lat. 2.

T. shell subulately turretted, snowy white; somewhat solid, normal number of whorls 8, which are rounded, with the suture impressed; ribs elevated, rounded, shining, somewhat numerous, with the interstices smooth; ribs ceasing in the last whorl, aperture ovate, thickened in front, two apicial whorls inflated and smooth.

King's Island, not numerous. The peculiar inflation of the two apicial whorls makes it doubtful whether the species does not belong to the genus *Truncatella,* but no truncate specimens were seen by me. The mouth is not entire nor rimate.

CITHARA TASMANICA. *n.s.* *C.t., fusiformi, utrinqué attenuata, eburnea, inter liras pallidissime rufo tincta; spira elata quam apertura longiore; anfractibus 7, convexis, postice angulatis et superné excavatis; eleganter longitudinaliter costatis (in ult. anfra. 12-14), et transversim, regulariter liratis; costis angulatis lævibus nitentibus; liris latis planatis; apertura anguste ovata, labro tenui.* Long. 12. Lat. 5.

C. shell fusiform, attenuate at both ends, ivory white, between the liræ tinged with very pale red; spire raised and longer than the aperture, whorls 7, convex, angular behind and excavate above, elegantly ribbed lengthwise (12-14 in last whorl), transversely regularly lirate; ribs angular, smooth, shining; liræ broad, flattened, aperture narrowly ovate, outer lip thin.

East Coast, rare. Mr. Justin Browne. A delicate, ivory white shell.

SYRNOLA BIFASCIATA. *n.s.* *S.t. parva, acuté elongata, tenui, nitenti, cornea, pallidé fulva bifasciata, polita, subtranslucida; anfractibus 10, convexiusculis, longitudinaliter tenuiter striatis, sutura impressa; apice mamillata; apertura pyriformi; labro tenui; labio reflexo, plica inconspicua, postica.* Long. 7. Lat. 2.

S. shell, small, acutely elongate, thin, shining, horny, with two pale fulvous bands, polished, sub-translucid; whorls 10, somewhat convex, finely striate lengthwise; suture impressed; apex mammillate; aperture pyriform, outer lip thin; inner lip reflexed, plait inconspicuous, posterior.

Long Bay, 10 fathoms. Rev. H. D. Atkinson. Legrand Only one specimen seen. Syrnola is a genus erected for banded translucent Odostomia.

RISSOINA GERTRUDIS. *n.s. R.t. minuta, turrita, subulata, subpyramidalis, lactea, translucenti, tenui; anfrac. 8, convexiusculis, creberrime plicatis, plicis parvis, rotundatis subobsoletis; ult. anfrac. basim versus spiraliter subtillissime striato; sutura late marginata; apertura semilunari; labro medio dilatato et incrassato; labio conspicuo, flexuoso, antice rimato.* Long. 4½. Lat. 1½.

P. shell minute, turrettedly subulate, sub-pyramidal, milky-white, translucent, thin; whorls 8, somewhat convex, very thickly plicate with small rounded subobsolete plaits; last whorl most delicately spirally striate towards the base; suture broadly margined; aperture semilunar; outer lip dilate in the middle and thickened; inner lip conspicuous, flexuous, rimate anteriorly.

King's Island, rare. I have only seen two specimens of this very minute shell, which is near to *R. nivea*, A. Adams, but smaller, and the sutures marginate.

RISSOINA (SETIA) BRAZIERI. *n.s. R.t. minuta, turbinato-conoidea, subumbilicata, alba, laté fulvo unifasciata; anfractibus 5, rotundatis, lævigatis, ultimo ad peripheriam angulato; apertura rotundata, superné angulata; peristoma integra. Operculum corneum 3-spir.* Long. 3, Lat. 2. *Testa aliquando epidermide intense olivaceo induta.*

R. shell, minute, turbinately conoid, subumbilicate, white, with one broad fulvous band; whorls 5, rounded, smooth, last angulate at the periphery, aperture rounded, angular above; peristome entire. Operculum horny, 3 spiral. This shell is sometimes clothed with a deep olive epidermis.

Isthmus Bay, Bruni Island, where it is very plentiful, entangled in confervoid growths on the rocks.

CINGULINA AUSTRALIS. *n.s. C.t. minuta, subulata, turrita, tenui, nitente, diaphaneo-alba, anfractibus 7, carinis elevatis, rotundatis, spiralibus instructis, interstitiis lævibus; carinis in ultim. anfrac. 5, deinde 4, 3, etc.; sutura profunde impressa; apertura oblonga, integra; labro crassiusculo; basi convexo, liris spiralibus (2) elevatis, rotundatis, ornato.* Long. 2. Lat. ⅔.

C. shell minute, subulate, turretted, thin, shining, transparently white, whorls 7, furnished with elevated rounded spiral keels, with smooth interstices; keel in the last whorl 5, then 4, 3 &c.; suture deeply impressed; aperture oblong, entire; outer lip somewhat thickened; base convex, ornamented with two spiral rounded elevated liræ.

Badger Island, rare. An extremely minute turretted white shell, with elevated spiral keels, &c.

DUNKERIA FASCIATA. *n.s. D.t. minuta, turrita, utrinque clathrata, translucente, pallidé lutea fasciata; anfractibus 6, convexis, bicarinatis, liris paucis, elevatis, nitentibus spiralibus, transversalibus pulcherrime cancellatis; labio simplici columella arcuata.* Long. 3½-4. Lat. 2.

D. shell minute, turretted, latticed all over, translucent and touched with pale yellow; whorls 6, convex, bicarinate and beautifully cancellate, with a few elevated, shining, spiral and transverse liræ; outer lip simple, columella arcuate.

Bass Straits, rather common, but so minute that the shell easily escapes notice. I may be wrong in assigning the species to the genus Dunkeria. The lattice pattern is so large, and the transverse and spiral ribs, which form it, are so far equal, that it makes a unique form.

RISSOA (CINGULA) MARIÆ. *R.t. minuta, ovato-conica, sub-turrita, translucente, fumoso-cornea, lutea obscure fasciata, anfractibus 4; ventricosis, declivibus, lævigatis, nitentibus; apertura integra, semilunari, postice angulata.* Long. 2½. Lat. ½.

R. shell minute, ovately conical, sub-turretted, translucent, smoky horn, and obscurely banded with yellow; whorls 4, ventricose, sloping, smooth, shining; aperture entire, semilunar, angulate posteriorly.

King's Island, common; a very minute shiny species.

DIALA TUMIDA. *n.s. D.t. minuta, pyramidato-tumida; albida, ad suturas sup. et infra luteo fasciata; anfrac. 6, planulatis, tumidis, obliquè plicatis; plicis subobsoletis; apertura circulari, labio reflexo.* Long. 2½. Lat. 1.

D. Shell minute, pyramidally tumid, whitish, banded with yellow above and below the sutures, whorls 6, tumid, but somewhat flattened, obliquely plicate, plaits almost obsolete, aperture circular; lip reflexed.

Swansea, rare. Coll. Legrand.

DIALA TESSELLATA. *n.s. D.t. elongata, conica, sub-nitente, alba, ad sutur. fascia fulvo maculata cincta; anfractibus 6, basi marginatis, planulatis; ultimo anfrac. angulato; apertura ovali, integra, antice sub-reflexa; labro tenui; labio antice subexpanso et reflexo.* Long. 6½. Lat. 4.

D. shell elongately conical, somewhat shining, white and girdled at the sutures with a fulvous spotted band; whorls 6, margined at the base and flattened; last whorl angulate; aperture oval, entire, sub-reflexed anteriorly; outer lip thin; inner lip anteriorly sub-expanded and reflexed.

Common in shallow places. A pretty white shell, with a graceful narrow band of brown spots at the suture. The mouth is faintly emarginate. There is a white variety of this shell, as well as one marked with three or four lines of long purplish spots.

DIALA PUNCTATA. *n s. D t., elongata, conica, sordide alba, lineis rufo-punctatis, crebrè cinctis; anfractibus 6, tumide-planatis, spiraliter sulcatis; ultimo anfractu ad peripheriam obtusé angulato; sutura impressa; apertura ovata; labro tenui; labio reflexo.* Long. 7½. Lat. 3.

D. shell elongately conical, sordidly white, thickly girdled with reddish spotted lines; whorls 6, tumidly flattened, spirally sulcate; last whorl obtusely angulate at the periphery, suture impressed, aperture ovate, outer lip thin, inner lip reflexed.

D'Entrecasteaux's Channel, very common, but in all the specimens, except a very few, the spiral grooves and punctuate markings were worn away, and the shell smooth and snowy white.

LITTORINA HISSEYIANA. *n.s.* *L. testa minutissima, globoso-turbinata, tenui, ventricosa; spira brevi, obtusa, spiraliter densé striata, albida, strigis olivaceis angulato-undulatis, sæpe confluentibus picta; anfractibus (5) rotundatis; apertura orbiculari, integra; labro interno subreflexo, acuto; columella subperforata.*

L. shell extremely minute, globosely turbinate, thin, ventricose, spire short, obtuse, densely spirally striate, whitish, with angulately undulate olive streaks, which are often confluent; whorls 5, rounded; aperture orbiculate, entire; internal lip sub-reflexed, acute, columella sub-perforate. Dimensions.—These shells are microscopic. They vary somewhat in size, but the largest do not exceed 1½ millimetres in length. About 50 specimens were found in the stomach of a Mullet, *Agenostoma diemenensis*, Rich. probably caught in the Derwent. The olive markings vary into lines and deeply shaded spots; sometimes the shell is uniformly olive, or even blue black.

NATICA TASMANICA. *n.s.* *N. testa obtecté umbilicata, depresso-orbiculari, crassa, spira brevi, parum exserta; anfrac. convexis rotundatis, lævibus vel oblique, densé, minutissimé striatis, apertura semilunari, horizontalis, columella tenuicula, callositate prominente spirali, sulcata, umbilico angulato-excavato; ad suturam intus callosam; pallide, fulva vel albida lineis pallide fuscis vel aurantaceis fasciatis; basi alba, intus castanea vel fulva.* Long. 13. Lat. 16. Anfr. 4. Aper. Long. 10. Lat. 6.

N. shell, with a somewhat covered umbilicus, depressedly orbicular, thick, with a short but slightly exsert spire; whorls convex, rounded, smooth, or obliquely thickly and most minutely striate, aperture semilunar, horizontal, columella somewhat thin, with a prominent callosity, which is spirally sulcate; umbilicus angularly excavate; with a kind of callosity within the suture at the mouth; pale fulvous or whitish, banded with brownish or orange lines; base white, chestnut or fulvous within.

This shell resembles *N. plumbea* more than any other, but is seldom more than half its size, and very much paler in color. Color is so persistent in the genus that it may well be considered a mark of specific value. If this not very common species has escaped previous naturalists, which, as far as I can learn, it has certainly done, it can only be from its having been regarded as a small and pale variety of *N. plumbea*, under which name, and that of *N. strangei* and *N. baconi*, I have seen it in cabinets. It is, however, entirely distinct in form and color and seldom varies from the dimensions given. Hab. E., S.E. and S. coasts.

NATICA NANA. *n.s.* *N. t. parva, solidiuscula, obliquè ovata, profundè umbilicata, sordidè alba, subnitente, tenuiter longitud. striata; spira subelevata; anfract. 4, rotundato-convexis sublævibus; apertura semilunari; labro tenui; labio recto crassiuscula.* Diam. mag. 7. Min. 5.

N. shell small, somewhat solid, obliquely ovate, deeply umbilicate, sordidly white, somewhat shining, slenderly striate lengthwise, spire subelevate; whorls 4, roundly convex, smoothish, aperture semilunar; outer lip thin; inner lip straight, somewhat thickened.

Long Bay, about 6 fathoms, in sand, Rev. H. D. Atkinson and Legrand. A small shell, white, slightly shining shell, very different in size and coloring from any other Australian form.

RUMA GLOBOSA. *n.s.* *R. t. profundè umbilicata, obliquè globoso-ovata, alba, epidermide lutea; spira pellucida, convexa; anfractibus 4, declive-ventricosis, striis undulatis, subtillissimis, transversè cinctis; apertura elongato-pyriformi; labro simplici; labio postice reflexo nitente.* Diam. maj. 27, diam. min. 19.

R. shell deeply umbilicate, obliquely globosely ovate, white, with a yellow epidermis; spire pellucid, convex; whorls 4, slopingly ventricose, transversely girdled with very fine undulating striæ; aperture elongately pyriform, outer lip simple; inner lip posteriorly reflexed, shining.

East Coast, common. This large and very elegant *Ruma* is of a globose habit, of dull white color, but sometimes completely covered with a shining, fibrous, thin yellow epidermis, with much the appearance of having been deposited by the mantle. In spite of its being common, it does not appear to have been described.

FOSSARINA SIMSONI. *n.s.* *F. t. obliquè depresso-globosa, obtectè umbilicata, tenuis, alba subnitente, fulvo undulosè maculata, spira plano-convexa, vix elevata; anfractibus 4, tenuissime creberriméque longitudinaliter striatis; ultimo anfracto valdè expanso: apertura rotundata; labro simplici; labio arcuato, postice-dilatato, sulco transverso.* Diam. maj. 6½. min., 5.

F. shell obliquely depressedly globose, umbilicus somewhat covered, thin, white, somewhat shining, undulately fulvous spotted; spire plano-convex, scarcely elevated; whorls 4, very finely and closely striate lengthwise; last whorl very much expanded, aperture rounded; outer lip simple; inner lip arcuate dilated posteriorly, with a transverse groove.

Rare, Long Bay, Bruni Island, Rev. H. D. Atkinson and Legrand. A pretty undulately variegated shell, with the inner lip produced posteriorly into a kind of channelled triangular elevation. I have dedicated this species to Mr. Augustus Simson, of Tasmania, late of Port Denison, Queensland, an indefatigable collector and investigator into every department of Natural History.

NASSA TASMANICA. *n.s. N. t. acuminato-ovata, solidiuscula, nitida castanea, luteo-castanea, vel fulva; spira sub-acuta; granoso-plicata (in ult. anfr. plic. 17), plicis supernè divisis, anfractibus 5, convexis, striatis, striis sub-distantibus, in ult. anfr. 11; apertura ovata, nitida, alba; labro solido, superne sub-calloso, intus dentato (dente conspicua in medio); columella valde callosa, callositate alba subrecurva.* Long. 12. Lat. 7.

N. shell acuminately ovate, somewhat solid, shining chestnut, yellowish chestnut or brown, spire sub acute; granosely plicate (plaits 17 in last whorl), plaits divided above by a channel; whorls 5, convex, striate; striæ sub-distant; 11 in last whorl; aperture ovate, shining, white; outer lip solid, subcallous above; toothed within, a conspicuous tooth in the middle, columella very callous, with a white subrecurved callosity.

This species is smaller than *N. fasciata* and *N. pauperata*, which it closely resembles in every respect except size, color, and the white callosities at the mouth. It is a pretty conspicuous shell, found only on the North and East Coast, where it is rather common. In *N. fasciata* the plicæ are very distinctly granulate throughout. In *N. pauperata* they are sub-obsolete except above, and in the present species they are scarcely distinct, except the one which is separated by a groove at the suture. On the whole it is nearer to *N. pauperata* than to *N. fasc.* A shell very like it, occurs in Port Jackson—*N. jacksoniana*, as far as size is concerned, but it is white or banded, and has no callosity. The normal color of our species is uniform chestnut, but all Nassæ vary very much in color. As all the specimens of *N. jacksoniana* seen by me were poor, and thin somewhat stunted shells, it has occurred to me that they were dwarfed specimens of our species, growing in unfavourable circumstances, and that Tasmania is its true home. In that case the species would be identical, but future observations must decide this.

CANCELLERIA TASMANICA. *n.s. C. t. oblonga, alba, spiraliter tenuiter lirata, liris parvis, validis, æqualibus; anfractibus 6, rotundatis, declivibus; spira acuta; sutura valida; labro tenui, conspicuè lirato; columella abbreviato, triplicato.* Long. 18½. Lat. 10.

C. shell oblong, white, slenderly spirally lirate, with small valid equal liræ; suture valid; outer lip thin, conspicuously lirate, columella abbreviate, triplicate.

King's Island, a white finely grooved shell, more elongate than *C. lævigata*, and nearer in form and habit to Gould's

C. viridula (Sowerby's Thesaurus, vol 11, p. 449, pl. 96, fig. 102) than any other form.

CROSSEA LABIATA. *n.s. C. t. parva, globoso-turbinata, anguste umbilicata, solidiuscula, alba, subopaca, spira elevata, sutura distincta; anfract. 5, rotundatis, undique tenuissime elongaliter transversim liratis, subtillisime long. striatis; umbilico callo rotundato marginato; apertura ovata, antice et postice angulata et canaliculata; labro sub-reflexo, extus fimbriato varicoso.* Long. 4. Lat. 2.

C. shell small, globosely turbinate, narrowly umbilicate, somewhat solid, white, subopaque, spire elevated, suture distinct; whorls 5, rounded, everywhere most slenderly, elegantly, lirate transversely, and very minutely striate lengthwise; umbilicus margined with a rounded callus; aperture ovate, anteriorly and posteriorly angulate and channelled; outer lip sub-reflexed, and with a fringe-like varix outside.

Long Bay, 10 fathoms, sand. The fourth species of a very rare genus. The only other are two dredged from Gott's Island in Japan, by Mr. Arthur Adams, and the third from Port Jackson, near the Sow and Pigs, at from 2 to 4 fathoms. This species is distinguished from the others by its reflected and fimbriate lip. The great peculiarity of this genus, says Mr. Adams (who erected it), consists in the canaliculate angular projection at the fore part of the aperture. In this species it is posteriorly channelled as well. *C. miranda* Ad. is varicose. *C. bellulus* Ad. has the outer lip thin. *C. concinna* Angas is pellucid and has the upper whorls punctate.

COLUMBELLA BADIA. *n.s. C. t. parva, acuminata, oblonga, intus extusque saturata badia; inconspicuè albide maculata, spira, acuta, anfractibus 7, planatis, lævibus nitentibus; apertura breviuscula; labro intus dentato; columella obscurè corrugata.* Long. 9. Lat. 3½.

C. shell small, acuminately oblong, saturated brown without and within, inconspicuously white spotted, spire acute; whorls 7, flattened, smooth, shining; aperture somewhat short, outer lip toothed within, columella obscurely corrugate.

Swansea, East Coast, common. A uniformly purple brown shell, faintly variegated when worn. There is an orange red variety from Brown's River and Blackman's Bay, which may be a different species.

COLUMBELLA ROBLINI. *n.s. C. t. parva, aciculari-ovata, sub-nitente, pallide castanea, undique crebré albo-fulvo maculata; anfractibus 7, planulatis, apice mamillato, intensé fusco; apertura latiuscula, labro obsolete dentato; columella corrugata.* Long. 9. Lat. 4.
Var. a. *Sanguineo-fulvo maculata.*

C. shell small, acicularly ovate, somewhat shining, pale chestnut, everywhere thickly spotted white and fulvous; whorls 7, flattened, apex mamillate, of a deep smoky brown; aperture somewhat broad, obsolutely toothed. Var. a. sanguineously brown spotted.

Common on the East Coast, Storm Bay, etc. It may be only a variety of *C. badia*, which it resembles in shape and size, but the markings seem only to vary within certain limits; becoming sometimes an interrupted band of blood red spots.

Columbella legrandi. *n.s. C. t. parva, subulata, tenui, nitente, castanea, maculis niveis fulvo umbratis ad suturas cingulata; apice mamillato; anfractibus, 6, elongatis, convexis, transversim subtillissime lineatis; apertura elongata ovata; labro tenui, simplici.* Long. 7½. Lat. 2.

C. shell small, subulate, thin, shiny chestnut, girdled at the suture with a band of snowy spots, shaded with fulvous brown; apex mamillate; whorls 6, elongate, convex, very finely transversely lined; aperture elongately ovate; outer lip, thin, simple.

King's Island, very rare. Two specimens only submitted to me, but both well preserved. A small mamillated subulate form, which cannot be mistaken for any other.

Columbella minuta. *n.s. C. t. ovata minuta, lævi, nitente, pallide castanea longitudinaliter crebré lineis castaneis ornata, et maculis albis transversim bifasciata; anfractibus 5, planulato tumidis; apertura ovata, postice acuta, labro incrassato, intus dentato.* Long. 3. Lat. 1½.

C. shell ovate, minute, smooth, shiny, pale chestnut, very thickly ornamented with chestnut longitudinal lines, bifasciate transversely with white spots; whorls 5, somewhat flatly tumid, aperture ovate, acute posteriorly, outer lip thickened, dentate within.

Swansea, East Coast, common. One of the smallest Columbellas known, and like all its congeners variable in color, but in the unworn specimens, the above characters seem pretty constant.

Euchelus tasmanicus. *n.s. E. t. parva depresso-turbinata, carneo alba, punctis rufis aliquando in lineis obliquis maculata; anfractibus 4, declivi-rotundatis, liris granulosis creberrimé gemmatis, interstitiis longitudinaliter plicatis, ad suturas canaliculato impressis; apertura obliqué ovata, subcirculari; labro intus lirato; labio post columellam bisulcato, et obliqué striato.* Diam. maj. 6, min. 5.

E. shell small, depressedly turbinate, fleshy white, spotted with red points, which are sometimes disposed in oblique lines; whorls 4, slopingly rounded, thickly gemmed with granulous liræ, the interstices plaited lengthwise, with a channelled impression at the sutures; aperture obliquely ovate, subcircular, outer lip lirate within, inner lip bisulcate and obliquely sulcate behind the columella.

Long Bay, Bruni Island, and S. Coast. This somewhat gibbous Euchelus appears to have traces of nacreous iridescence, internally. It is very distinct in size (being the smallest of our species) from *E. baccatus, Mke*, though somewhat near shape and color. Rather scarce.

GIBBULA AUREA. *n.s.* *G. t. parva, turbinato-conoidea, vix umbilicata, luteo alba, maculis rufo-aureis, pulcherrime picta; anfractibus 4, basin marginatis et planulatis, supernè rotundatis, ad suturam constrictis; liris irregularibus, oblique subtillissime striatis cinctis; marginé eleganter alba et rufo-aurea tesselato; basi convexiusculo, lineis concentricis impressis tesselatis sculpta, apertura rotundata.* Long. alt. 5, diam. 4.

G. shell small, turbinately conical, scarcely umbilicate, yellowish white, painted very prettily with reddish gold spots; whorls 4, margined at the base and flattened, rounded above and constricted at the suture; girdled with irregular obliquely striate, very fine striæ; margin elegantly tesselated, with white and reddish gold; base sculptured with impressed tessellated lines. Aperture rounded.

King's Island, rare. A very pretty shell, which is very nacreous underneath.

CANTHARIDEA ORNATA. *n.s.* *C. t. vix umbilicata, conoideo-turbinata fusco et viridi variegata; anfractibus declivi planulatis, supernè conspicué tuberculatis (in ultimo anfractu decem), obsolete oblique corrugatis et subtillissime decussatis; ultimo anfractu ad peripheriam acute angulato et obtuse tuberculato; basi planato, decussatim granato liris tribus fusco maculatis ornato; apertura subquadrata, columella arcuata et canaliculata; labio acuto.* Long. 19. Lat. 20.

C. shell scarcely umbilicate, turbinately conoid, variegated brown and green; whorls sloping and flattened, conspicuously tubercled above (tubercles in the last whorl 10 in number), faintly obliquely corrugated and very finely decussate; last whorl sharply angulate, and obtusely tuberculate at the periphery; base flattened; decussately granular, ornamented with three brown spotted liræ; aperture subquadrate, columella arcuate and canaliculate; lip acute. Seen from above the tubercles seem radiate, like the spokes of a wheel.

This shell, with some others, were given to me by Mr. Ronald Gunn, the eminent botanist and naturalist, to whom Tasmania owes so much. He found it seldom, and on the north cost only. It is a very beautiful species with bright emerald green markings, and shelly operculum. It is closely called to *C. aureus*, Jonas, but distinguished by its color, larger size, and the very conspicuous tubercles crowning the whorls.

LIOTIA TASMANICA. *n.s.* *L. t. parva, discoidea; sordide alba, spira plano-depressa, costis spiralibus subobsoletis, et liris longitudinalibus creberrimé ornata; peripheria carinis duobus nodosis, nodis in 2 anfr. elevatis et imbricatis; apertura margine reflexo incrassata; umbilico peramplo, spiraliter dentato.* Diam. maj. 8, min. 6. Alt. 3.

L. shell small, discoid, sordidly white, spire plano-depressed. ornamented thickly with spiral sub-obsolete ribs and longitudinal liræ, with two nodose keels at the periphery, nodæ in the second whorl raised and imbricated, aperture with the margin reflexed and thickened, umbilicus very wide and spirally dentate.

Long Bay, rare. Rev. H. D. Atkinson. This shell is nacreous within, and very near in form to *L. discoidea* Reeve. The nodæ on the upper carina become little raised hollow rounded squamæ on the second whorl.

MONILEA ROSEA. *n.s. M. t. minuta, turbinata, late umbilicata, rosea, maculis albis variegata ; anfractibus 4, rotundatis, striis albis magnis et parvis alternantibus cinctis ; apertura integra, rotundata ; labro producto ; labio simplici ; margine umbilici callo inconspicuo, albo, corrugato instructo.* Diam. 3.

M. shell minute, turbinate, widely umbilicate, rose color, variegated with white spots, whorls 4, rounded, encircled with white alternating large and small striæ ; aperture entire, rounded ; outer lip produced ; inner lip simple ; umbilical margin furnished with a somewhat inconspicuous white corrugated umbilicus.

This small shell is of intense carmine color in some specimens. The outer lip is produced very much from the suture so as to give the aperture a sunken appearance. The callosity at the umbilicus is only perceptable under the lens in very good specimens.

GIBBULA DEPRESSA. *n.s. G. t. depresso-orbiculata, fulvo-purpurea lugubre tincta ; umbilicata, late sulcata, sulcis transversim striatis ; anfractibus 5, depressis ; ultimo anfracta permagno, cingulis sex subelevatis, transversis, aliquando tessellatis insigno ; apertura obliquè subquadrata, intus lirata, roseà viridique splendidé irridescente, labro tenui ; labio subreflexo.* Diam. 10 mill.

G. shell depressedly orbiculate, lugubriously-painted fulvous brown and purple, umbilicate, widely sulcate, sulci transversely striate ; whorls 5, depressed, last whorl, which is much larger, distinguished by 6 transverse sub-elevated, and sometimes tessellated belts ; aperture obliquely sub-quadrate, lirate within, and splendidly iridescent with rose and dark green ; outer lip thin ; inner lip sub-reflexed.

Adventure Bay, common. This shell is always more or less encrusted with Polyzoa (Membranipora and Cellepora). It might easily be mistaken for young shells of *Trochocochlea striolata.* Its depressed, almost angular, form and interior iridescense, render it easily recognised.

ZIZYPHINUS LEGRANDI. *n.s. Z.t. abbreviato-conica, carneo-flavescenti ; anfractibus 6, planulatis, spiraliter densè canaliculato-liratis ; ultimo anfractu angulato ; basi planulato, lineis impressis, alternantibus sculpta ; apertura subquadrata ; labro acuto ; labio simplici.* Alt et diam. 12.

Z. shell abbreviately conical, fleshy yellow ; whorls 6, somewhat flattened ; densely spirally canaliculately lirate ; last whorl angulate, base flattened, sculptured with fine alternating impressed lines; aperture sub-quadrate; outer lip acute, inner lip simple.

Rare, Chappell Island, Bass' Straits. A small conical form, whose nearest congener is our reversed *Z incertus* Reeve. Its peculiarity for an Australian form of the genus is the absence of granulations on the liræ.

ZIZYPHINUS ALLPORTI. *n.s. Z.t. tumido-conica, solidiuscula, alba; anfractibus 6, convexo-declivibus; liris transversis, granulosis cinctis; granulis rotundatis, interstitiis longitudinalibus oblique separatis; sutura canaliculata; ultimo anfractu ad peripheriam rotundato; basi convexiusculo, lineis subgranosis impresso; apertura obliqué quadrata; labro intus lirato, infra bidentato, labio simplici.* Alt. 11. Diam. 9.

Z. shell tumidly conical, somewhat solid, white; whorls 7, convexly sloping, girdled with transverse granular liræ; granules rounded, separated by oblique longitudinal striæ; suture canaliculate, last whorl rounded at the periphery, base somewhat convex, impressed with sub-granular lines; aperture obliquely quadrate: outer lip lirate within; bidentate below; inner lip simple.

Islands in Bass' Straits, very rare. A white, small, tumid shell, in habit much resembling a Thalotia.

CLANCULUS ALOYSII. *n.s. C. t. turbinato-conoidea, umbilicata, albida, lineis et maculis intensé fuscis, vel atratis variegata; anfractibus 5-7 planulatis, transversim sulcatis, et cingulis granosis ornatis (cingul. 5 in ult. anfr.), cingulis superioribus et inferioribus granulis majoribus conspicuis; sutura subcanaliculata; anfractu ultimo ad peripheriam subcarinato, basi planiusculo cingulis granosis ornato; columella contorta, superné et infra dentato dentibus parvis; labro lirato et dentato; margine umbilici spiraliter striato.* Diam. 11.

C. shell turbinately conoid, umbilicate, whitish, variegated with lines and spots of deep dusky brown or blackish; whorls 5 to 7, flattened, transversely sulcate and ornamented with granular belts (belts 5 in the last whorl), upper and lower belts conspicuous by their larger granulations; suture subcanaliculate; last whorl subcarinate at the periphery, base somewhat flattened and ornamented with granular belts; columella twisted, dentate with small teeth above and below, outer lip lirate and dentate, umbilical margin spirally striate.

Though the Clanculæ vary somewhat in coloring, it is always within certain limits. There is no other black and white Clanculus among our Tasmanian species, which are numerous.

CLANCULUS PHILOMENÆ. *n.s. C. t. depresso-conica, alba; anfrac. 5, ad suturas canaliculatis, concavis, marginibus utrinque moniliferis, infra marg. 3-4 liratis; liris granis circular. nitentib. ornatis, interstitiis subtillissime obliqué striatis; ultimo anfract. acute angulato et marginato; basi plano, spiraliter granulosé lirato; apertura oblique quadrato; labro intus lirato: columella unidentato et corrugato; margine umbilico spiraliter dentato.* Diam. mag. 11. Alt. 10.

C. shell depressedly conical, white, whorls 5, at the suture canaliculate, concave, with both margins beaded, within the margins 3-4 lirate; liræ ornamented with round shining granules, interstices very finely obliquely striate, last whorl acutely angulate and margined; base flat, spirally granulosely lirate; aperture obliquely squared; outer lip lirate within; columella unidentate and corrugated; umbilical margin spirally dentate.

One specimen. A very distinct white shell with moniliferous whorls rising in stages.

Cylichna atkinsoni. *n.s.* *C. t. parva, cylindracea, angusta, tenui, ferruginea, spira umbilicata, occulta, tenuissime long. et transversim striata, sordide alba; labro tenui, acuto, medio coarctato, antice sub-dilatato; labio angusto, reflexo.* Long. 4½. Lat. 2.

C. shell small, cylindrical, narrow, thin, ferruginous, spire umbilicate, hidden, very slenderly lengthwise and transversely striate, sordid white, outer lip thin, acute, drawn in at the middle, and sub-dilate anteriorly; inner lip narrow, reflexed.

Long Bay, not common. A very small shell, brought up occasionally by the dredge from 10 fathoms; sandy bottom. Rev. H. D. Atkinson. The other Tasmanian species is *C. arachis*, which is Australian also. In its young state it can always be distinguished from the foregoing by the dense undulating transverse striæ with which it is covered.

Aplysia tasmanica. *n.s.* *A. t. tenui fragili, translucente, nitente, oblique subquadrata, tenuiter concentrice striata, et transversim minute sulcata; intus subtestacea, leviter concava, encausta, cornea; apice vix incurvo; margine superiori subreflexo, arcuato; margine inferiori obliquo recto, antice producto, rotundato.* Diam. mag. 38, transversim diam. max. 28 mil.

A. shell thin, fragile, translucent, shiny, obliquely subquadrate, slenderly concentrically striate and transversely minutely sulcate, subtestaceous within, slightly concave, enamelled, horny, apex scarcely incurved, with the upper margin arcuate and subreflexed; lower margin oblique and straight, anteriorly produced and rounded.

A large form of talcous appearance, the margin becoming insensibly membranaceous. It is somewhat similar in form to *A. gigantea*, of Sydney, but more oval, membranaceous, and smaller.

Acmæa marmorata. *n.s.* *A. t. quadrato-oblonga, postice dilatata depressa, sordide olivacea, apice eroso vel acuto, submediano; costis 8-10, rudis, erosis, radiantibus, distantibus; intus nitente conspicue variegata, radiis luteis concavis, interstitiis atrofusciss; spathula nigerrima, margine albo, atro-punctato conspicuo.* Long. 21. Lat. 15. Alt. 6.

P. shell quadrately oblong, dilate behind, depressed, sordidly olive; apex corroded or acute, submedian; ribs 8-11, wide, corroded, radiating and distant; within shiny and conspicuously variegated, with white rays and very black broad interstices, spathula, black, with a white conspicuous margin.

Common. The intensely black marbled appearance of the interior of this shell will distinguish it at once. It is found, I am told, in New South Wales, but rarely.

PATELLA TASMANICA. *n.s.* *P. t. ovata, solida, sordide luteo-alba, sæpe corrosa ; apice submediano ; costis radiantibus, 21 circiter, validis, angulatis ; interstitiis liris subtillibus subimbricatis profuse radiata ; intus eburnea, nitente plus minusve luteo tincta, margine angusta, elegantissime pectinata, intus cæruleo tenuissime lineato, extus linea fusca interrupta marginato ; spathala vix definita.* Long. 49. Lat. 38. Alt 20.

P. shell ovate, solid, sordidly yellowish white, often corroded, apex sub-median with about 21 valid, angular radiating ribs, and the interstices rayed profusely with very fine subimbricated liræ ; within ivory white and shiny, more or less tinged with yellow ; margin narrow elegantly pectinated ; margined with a very fine blue line within, and an interrupted dusky brown line outside. Spathula scarcely defined.

Recherche Bay and south generally. Nearer to *P. alticostata Angas* than any other.

PATELLA CHAPMANI. *n.s.* *P. t. ovata, postice latiuscula, depressa, rufa vel ustulata, et nebuloso brunea ; apice acuto, submediano ; costis radiantibus 8., plus minusve validis, depresso rotundatis ; liris subtillibus profuse radiata, et sulcis irregularibus cincta ; margine angulato, noduloso; intus alba et pallide rosea nebulosa ; spathula vix visibilis.* Long. 20. Lat. 15. Alt. 5.

P. shell ovate, somewhat broad behind, reddish or scorched and nebulously brown, apex acute, submedian, with 8 radiating ribs more or less valid, and depressedly rounded, profusely radiate with very fine liræ, and girdled with irregular sulci ; margin angulate, nodulose ; white within and clouded pale rose color, spathula scarcely visible.

Very rare. Four of the ribs are posterior, and the four anterior are smaller. I have dedicated this shell to Commodore Chapman, of H.M.S. Dido, an industrious conchologist, and from whom I received valuable assistance in preparing my list of Tasmanian Mollusca.

MACROSCHISMA TASMANICA. *n.s.* *M. t. ovato-oblonga, dorso elevata, convexa, pallidé luteo-castanea, radiatim atrata, lineis elevatis, nodulosis, radiata ; sulcis concentricis irrégularibus, rugosa, lineis concentricis confertissimis sculpta ; extremitatibus rotundatis ; postice elevata. Foramen magnum, elongatum, subtriangulare, postice dilatatum, excavatum.* Long. 32. Lat. 18. Alt. 9.

M. shell ovately oblong, dorsal region raised and convex, pale yellowish chestnut, with blackish rays ; radiate with nodulous elevated lines ; rough, with irregular concentric sulci, sculptured with very close concentric lines, ends rounded ; posterior end raised ; foramen large, elongate, sub-triangular, dilate and excavate behind.

The common Macroschisma, of Tasmanian coasts. Until now it has been confounded with *M. producta* (A. Adams, Pro. Zool. Soc. 1850 p. 202, sp. 7) which is a narrower shell, less distinctly ribbed, and with a narrow and somewhat constricted foramen.

AURICULA (RHODOSTOMA) DYERIANA. *n.s. A. t. ovata, inflata, subumbilicata crassa, viride albicante, fulvo bifasciata, striata, striis regularibus, distantibus* ; *anfract.* 6, *suturis obsoletis ; spira conica, planata ; apertura integra, nitente, pallide fulva* ; *labro incrassato, bilabiato, intus conspicué triangulari inciso et dentato* ; *labio bidentato ; umbilico clauso, marginato.* Long. 14. Lat. 9.

A. shell ovate, inflated, subumbilicate, thick, greenish white, with two fulvous bands, striate, striæ regular, distant; whorls 6 suture obsolete; spire conical flattened, aperture entire, shining pale fulvous, outer lip thickened, bilabiate, with a triangular notch within, inner lip bidentate; umbilicus closed and margined.

North Coast, brackish waters. There is a shell somewhat like this described by Mr. Swainson (Proc. Roy. Soc. Tas. Vol. 3, p. 45), from Dr. Milligan's collection, and probably from Australia, but it is large, of different color, and with a semicircular notch on the outer lip. I have named the species after Mr. Dyer, of Hobart Town, the industrious collector, who discovered it at Kelso.

PECTEN MARIÆ. *n,s. P. t. trigonali-orbiculari, subæquivalva, depressa, valva dextra paulo convexiore, auribus inæqualibus, rosea vel roseo-violascente, nebulis purpureis et lineis maculisque albis peculiariter marmorata ; costis* 8 *irregulariter long. sulcatis, et obsolete squamatis, lirisque parvioribus, intermediis inæqualibus radiatis, superficie tota tenuiter squamose imbricata ; auribus radiatim costatis, costis nodosé imbricatis valvis intus violaceis, sericeis.* Long. et. Lat. 44. Alt. 16.

P. shell triangularly orbicular, subequivalve, depressed, right valve a little more convex, ears unequal; rose color or rosy violet, and peculiarly marbled with purple clouds, and white lines and spots; ribs 8, irregularly sulcate lengthwise and obsoletely scaly; radiate with smaller liræ; surface wholly finely imbricately squamose; ears radiately ribbed, ribs nodosely imbricated, valves colored a kind of silky violet within.

East Coast and Maria Island. Rather uncommon. Nearest to Sowerby's *Pecten serratus.* The fine shagreen marking is different from *P. bifrons*, inasmuch as the scales are finely pointed. The violet hue of the inside and silky appearance are very constant. The obsoletely squamose ribs vary, but it is a character not seen in any other Tasmanian species.

DOSINIA IMMACULATA. *n.s. D. t. suborbiculari subinflata ; umbones versus subattenuata, nivea, subnitida et sub lente eleganter irridescenti, umbonibus leviter carneola maculatis, concentrice tenuiter striata ; striis subtillissime elegantissimeque decussata ; area ligamenti angusté lanceolata ; lunula parva, late cordata, impressa, medio carinata, intus alba ; sinu palliari profundo, obtuse triangulato.* Long. 20. Lat. 26.

D. shell suborbicular subinflated, subattenuate towards the umbones, snowy white, somewhat shining, and under the lens elegantly irridescent, umbones lightly spotted with pink, slenderly striate, and decussate very finely and elegantly with fine striæ, ligamental area narrowly lanceolate, lunule small, broadly cordate, impressed and carinate in the middle; pallial sinus deep and obtusely triangular,

East Coast, uncommon. A very beautiful snowy white, and neatly rounded shell. The transverse striæ are very regular and corbis like.

CALLISTA VICTORIÆ. *n.s. C. t. trigono-subcordata, crassa, tumida, antice rotundata, postice obtusé angulata, inæquilaterali, confertissime concentricé striata (striis anticé lamellosis, lamellis 3, vel. 4, parvis, crassis); subnitida, pallide carnea, lineis latis inæqualibus, rufo-castaneis, longitudinaliter pauci-radiata; lunula elongata, tenuistriata, linea impressa circumscripta; latere postico obtusé angulato, planato, rugosé striata; valvis intus, nitentibus, rufo-lutea nebulosis, marginé denticulato.* Long. 55. Lat. 60. Alt. 35.

C. shell triangularly subcordate, thick, tumid, rounded in front and posteriorly obtusely angulate, inequilateral, very thickly concentrically striate (striæ anteriorly lamellose with 3 or 4 thick small lamellæ) somewhat shining, pale flesh color, rayed lengthwise, with few broad unequal reddish chestnut lines; lunule elongated, slenderly striate, circumscribed with an impressed line; posterior line obtusely angulate, flattened, and rugosely striate; valves shining very much within, and clouded reddish yellow, margin denticulate.

A somewhat common shell on all the South Australian and Victorian costs, and is said to occur in S. E. Australia, but the identification is doubtful, as it has been confounded with *C. rutila*, Sow., with none of the description or figures of which it corresponds. The specimens from which the description is taken came from Cloudy Bay on the South of Bruny Island. It also is found in Frederick Henry Bay. I have never found it except on sandy exposed coasts where there is a heavy surf.

VENERUPIS RETICULATA. *n.s. V. t. transversa, subquadrata, tenui, depressa, valde inæquilaterali, antice rotundata, brevi, postice depressiuscula, latiore, subtruncata; costis transversis obsoletis, planatis, divaricatis, undulosis creberrime cincta (sublente); undiqué tenuissime longitudinaliter striata; valvis intus albis, cardine parvo inæqualiter tridentato, dentibus medianis et posticis bifidis; sinu pallii angusto, rotundato, obtuso. Albida, postice lineis angulatis atro reticulata, aliquando versus umbones radiatim rosea tincta.* Long. 17. Lat. 17. Alt. 12.

V. shell transverse, subquadrate, thin, depressed, very inequilateral anteriorly rounded, short, somewhat depressed, posteriorly and border very thickly girdled with transverse obsolete flattened, undulating ribs; under the lens longitudinally striate in every part; valves white within, hinge small, unequally tridentate, with the median and posterior teeth bifid, pallial sinus narrow, rounded, and obtuse. White reticulated posteriorly with black angulate lines, sometimes radiately rose tinted towards the umbones.

Not uncommon on South coast. A small shell, very distinct by its finely crenulately striate obsolete ribs, and reticulate markings.

MYODORA TASMANICA. *n.s. M. testa albida, curvato-oblonga, antice leviter flexuosa, abrupte truncata, valva sinistra ventricoso-convexa, dextera distincte concava; concentrice striata; striis paucis, rotundatis latiusculis, subdistantibus, regulariter, crescentibus; sublent elegantissime, tenuissime decussata.*

M. shell whitish, curvately oblong, anterior slightly flexuous, abruptly truncate, left valve ventricosely convex; right valve distinctly concave, concentrically striate with a few round, somewhat broad, sub-distant ridges, which increase regularly towards the margin, and very finely and beautifully decussate with undulating striæ. Long. 17. Lat. 13. Alt. 4.

This very distinct species of Myadora has more affinities with the Australian *M. pandoræformis* than any other, but it has no movable testaceous appendage, and the valves are both distinctly striately ridged. Hab. Long Bay.

MYODORA ALBIDA, *n.s. M. testa albida, translucida, subquadrata oblonga, subconvexa, anticé latissimé truncata; concentrice striata; striis elevatis, rotundatis, regularibus, paucis, prope marginem anticam angulatis.*

M. shell whitish, translucent, subquadrately oblong, subconvex, very broadly truncate anteriorly, concentrically striate, striæ rounded, raised, regular, few, angulated near the anterior margin. Long. 10. Lat. 6. Alt. 2.

A very pretty species, differing from the last in its subquadrate form, and its convex valves, which are both regularly and distinctly striate. Hab. Long Bay.

ANAPA TASMANICA. *n.s. A.t. crassa, trigona, gibbosa, æquivalvi, antice rotundata postice angulata et planata, sordide alba, concentrice tenué sulcata, versus marginem epidermidé olivacea induta; umbonibus parvis, incurvis obliquis distantibus; area ligamentali parva, inconspicua, aperta; pagina, interna nivea nitente, sinu palli nullo.* Long. 19. Lat. 19. Alt. 16.

A. shell thick, trigonal, gibbous, equivalve, rounded anteriorly, angulated posteriorly and flattened, sordidly white concentrically finely sulcate, clothed with an olive epidermis towards the margin; with small incurved distant umbones, ligamental area small, inconspicuous, open, interior surface snowy white and shining, no pallial sinus.

This shell appears to me to have been confounded with *A. smithii* and *A. triquetra*, which is a synomym of *Gray*. That shell is not found in Tasmania. It is, however, a much smaller and thinner shell, less tumid and more trigonal, with very much the appearance of a *Cyclas*. I cannot find that it has been described.

PINNA TASMANICA. *n.s. P. t. ovato-cuneiformi, tenui, subventricosa, marginibus rotundatis, sordide olivacea, purpureo nebulosa, radiatim costata, costis interdum obsoletis, subnodosis, versus marginem sparsim, irregulariter squamosis, squamis elevatis subtubuliformis ; apice subtruncato, livido.* Long. 190. Lat. 85. Alt. 28.

P. shell ovately cuneiform, thin, subventricose, margins rounded, sordidly olive, clouded with purple, radiately ribbed, ribs sometimes obsolete subnodose, and towards the margin sparsely irregularly scaly, scales elevated subtubuliform, apex subtruncate, livid.

Rare. On the north coast only. W. Legrand. This fine Pinna is one of the very few of the genus, with the margins rounded and not angulate. In this respect, and in the few irregularly much raised tubular scales, it is quite distinct from *P. zelania*, which is not uncommon in Australia.

MYTILICARDIA TASMANICA. *C. t. elongato ovata, in. medio constricta vel sinu profundo distorta, luteola vel sordide alba, epidermide fusca, maxime inæquilaterali, antico brevissima, subtruncata, postice dilatata, inferne sinuosa et hiante, radiatim costata, umbonibus minimis compressis approximatis obliquis ; lunula inconspicua, profunda ; costis inæqualibus, irregularibus, flexuosis, postice lamellosis et obsoletis, primis in latere antico angustioribus, alteris sensim latioribus.* Long. 10. Lat. 21. Alt. 14.

M. shell elongately ovate, narrowed in the middle or distorted, with a profound sinus, yellowish or sordidly white; with a dusky epidermis, very inequilateral ,extremely short anteriorly, subtruncate, dilated posteriorly, sinuous and gaping below, radiately ribbed, with small compressed approximate oblique umbones; lunule inconspicuous, very deep, ribs unequal, irregular, flexuous, lamellose and obsolete posteriorly, the first on the anterior side somewhat narrower, the others becoming gradually wider.

Blackman's Bay, uncommon. Distinguished from *M. excavata* by the epidermis, and the ribs being smooth instead of having the lamellar projecting scales.

MYTILUS TASMANICUS. *n.s. M. t. oblongo-ovali, tumida, crassa, concentrice tenué irregulariter striata, epidermide atro-purpurea, basim versus sparsim, irregulariter barbata capillis longis, corneis, discisque calcareis radicatis ; marginibus intus extusque viride viride peculiariter encaustis ; umbonibus terminalibus, parvis, acutis, curvatis nitentibus, glabratis, parum margaritaceis ; fossula ad ligamentum recipiendum satis profunda ; pagina interna nivea, impessione pallii et musculari tantum iridescente, ligamento longo conspicuo.* Long. 175. Lat. 75. Alt. 45.

M. shell oblong, oval, tumid, thick, concentrically finely irregularly striate, epidermis black purple, towards the base sparsely and irregularly bearded with long horny hairs, which are rooted in calcareous discs ; the margins peculiarly enamelled a vivid green both outside and inside ; umbones small acute, curved, shining, smoothed, slightly pearly, fossula for the ligament somewhat deep ; internal surface snowy white, the pallial and muscu'ar impressions alone being iridescent, ligament long, conspicuous.

A truly magnificent species, which is so large that it must always be a conspicuous object, yet the peculiar and brilliant green enamel of the edges makes it still more so. It is only found in deep water in Storm Bay. The only shell approaching to it in character is *M. latus*, of New Zealand.

PYTHINA TASMANICA. *n.s. P. t. parva suborbiculari, convexa, alba, sulcis concentricis et costis bifariam radiantibus eleganter clathrata ; costis angulatis postice curvatis parumque elevatis, umbonibus, submedianis obliquis, parvis.* Long. 7. Lat. 8. Alt. 3.

P. shell suborbicular, convex, white, elegantly latticed with concentric sulci and ribs radiating in opposite ways; ribs angulate and curved, and slightly raised behind, umbones submedian, oblique and small.

This elegant Pythina is very distinct from the common *P. deshayesi*, which is larger, has the divaricating ribs somewhat lamellose behind, and is not latticed with transverse sulcations. King's Island, rare.

TELLINA MARIÆ. *T. t. transversa ellipitica, subinflata, nitente, lactea, tenui æquilaterali, inæquivalvi, postice hiante, antice late rotundata, postice vix attenuato, flexura minima, undique crebré tenuiter sulcata, ligamento pallide castaneo prominulo.* Long. 22. Lat. 28.

T. shell transverse, elliptical, subinflated; shining, milk white, thin, equilateral, inequivalve, gaping posteriorly, widely rounded in front, scarcely attenuated behind, flexure very slight, thickly and finely sulcate, ligament pale chestnut, somewhat prominent.

Rather uncommon. South Coast. W. Legrand. A white shell, with no determinate characters except its oval form, absence of color, and almost perfect absence of flexure. There are are three small hinge teeth in one valve, and two in the other, and the pallial sinus is very large.

LUCINA MINIMA. *n.s. L. t. parva subventricosa, oblonga transversa, tenui, alba, tenui-costata, costis numerosis concentrice, tenuiter, regulariter elegantissimeque striata, valde inæquilaterali, latere antico longiore rotundato, postico latiore, margine integro, umbonibus productis obliquis, parvis incurvis, conspicue concentrice striatis ; valvis intus albis, impress. mus. conspicuis ; valv. dext. in med. unidentato dente bifido, val. sinis. bidentato, dente antico bifido.* Long. 8. Lat. 9. Alt. 5.

L. shell small, subventricose, oblong, transverse, thin, white, slenderly ribbed, ribs numerous, finely regularly and most elegantly striate ; very inequilateral, anterior side the longer, rounder, the posterior side wide ; margin entire, umbones produced, oblique, small, incurved, conspicuously concentrically striate, valves white within, muscular impression conspicuous, right valve unidentate with a bifid tooth ; left valve bidentate, the anterior one bifid.

Badger Island, rare.

DESCRIPTIVE NOTES ON A NEW VACCINIUM FROM SAMOA.

By Baron Ferd. von Mueller, C.M.G., M.D., F.R.S.

Among a number of Samoan plants placed for elucidation at my disposal by the Rev. S. T. Whitmee, M.A., F.L.S., F.G.S., F.R.G.S., occurs a whortleberry-bush, the first member of the order of Vaccinieæ, as yet known from that Group. The Royal Society of Tasmania has favoured me on former occasions by promulgating notes on plants not always Tasmanian, and, perhaps, this privilege will be continued at this and future opportunities to render known remarkable undescribed plants through the pages of its publications, while this advantage will be all the more appreciated, inasmuch as the praiseworthy regularity and punctuality with which the Tasmanian Society issues its papers, affords the most favourable vehicle in Australia for the early record of new observations. Passingly, it may here be observed, that some of the plants of Mr. Whitmee's collections, which latter were formed at great risk, toil, and expense of the reverend gentleman, amidst the arduous duties of his ecclesiastical position, have been alluded to in an appendix to Mr. F. Campbell's work on the New Hebrides, and in a recent publication on Papuan plants from Sir William MacArthur's sendings.

Melbourne, December, 1875.

VACCINIUM WHITMEEI.

(Sect. Epigynium.)

Erect, evergreen ; branchlets slightly downy, all other parts glabrous ; leaves oval, contracted into a very short petiole, blunt at the summit, entirely without teeth ; peduncles axillary, solitary, one flowered, recurved ; bracts very early deciduous ; tube of the calyx depressed-hemispheric, several times broader than long ; teeth of the calyx five, rarely six, deltoid ; tube of the corolla ovate-cylindrical, lobes slightly spreading, rhomboid semi-ovate, several times shorter than the tube ; anthers somewhat shorter than the filaments, oblong, at the apex very slightly bilobed, neither conspicuously attenuated, nor spurred, nor at the base incurved ; style stout, shorter than the corolla ; berry much broader than long ; embryo more than half as long as the albumen, black.

On the higher mountains of the Samoa Islands : Leaves coriaceous, $\frac{2}{3}$in. 1in. long, penniveined and slightly reticulated, almost flat, not dotted ; peduncles $\frac{1}{3}$in. $\frac{1}{2}$in. long ; teeth of the calyx in age measuring about one line; corolla exceeding hardly ⅛in. in length, unbearded; its lobes imbricate in bud; filaments 10, rarely 12, fixed to the very base of the corolla, of equal length, not fringed; anthers 1in. long, opening with two terminal pores; styles about 2in. long; berry ¼in. in diameter; seeds pale brown, half a line long, cuneate-ovate, angular, finely streaked.

The anthers distinguish this species from nearly all its numerous congeners, and bring it near the section Notopora (J. Hook. Icon. plant. 1159), but they are fixed below not above the middle.

There seem to be but few other species of Vaccinium known from any part of Polynesia. Of these *V. Vitiense (Paphia Vitiensis*, Seem. journ. of Bot. 1864, p. 77; Flor. Vit. p. 146, t. xxviii) differs in its large flowers, reminding of certain Thibandias, of which genus at least the species with free stamens should be included in Vaccinium, as indicated by the writer in the volume of the Acclimatisation Society of Victoria for 1872.

V. cereum (G. Forst. florul. insul. Austr. prodr. p. 28; *Andromeda cerea*, Murr. syst. veg. 406) from Tahiti as well as *V. macgillivrayi* (Seem. journ. of Bot. 1864, p. 67) from the New Hebrides, differ both by their acute and especially serrated leaves, their cleft calcarate anthers and sphærical fruits. In a similar manner, *V. reticulatum* (Sm. in Rees's Cyclop. 1824), of the Sandwich Islands, is removed from our plant; besides it has lanceolate lobes of the calyx, while the tube of the latter is as long as it is broad.

V. plenduliflorum (Gandich. in Freycen. Voy. Bot. 454, t. 68) also from Hawaia differs, irrespective of the serratures of the leaves, in longer peduncles, much elongated lobes of the calyx, anthers with dorsal appendages, slender style, almost globular fruit and a shorter embryo.

Dr. Asa Gray has offered on the Polynesian Vaccinia notes referring to characteristics and synonymy in the Proceedings of the American Academy for Arts and Science, 1862, p. 323-324.

Among Indian species, *V. Rollinsoni* (Hook. bot. Magaz. 4612) from Java, is nearest, except perhaps the very imperfectly known *V. microphyllum* (Reinw. in Blume's Bijdr. 851) from Celebes. The former has almost precisely the same foliage, and also slightly downy branchlets, while the flowers are not always terminal and racemose, but also axillary and solitary; the berries, however, are globular.*

I am not acquainted as yet with any true Vaccinium from Australia and New Caledonia, but the genus will likely be found well represented in the higher regions of New Guinea.

The Samoan collection received from the Rev. S. T. Whitmee, contains the following cotyledonar plants:—

Stephania hernandifolia, Walp.
Cardamine sarmentosa, G. Forst.
Hibiscus abelmoschus, Lin.
Trichospermum richei, Seem.

* Since writing the above I have had access to the illustrated plate of Vaccinium Rollisoni. It differs from V. Whitmeei also in its hairy pedicels and (especially) filaments.

Triumfetta angulata, Lam.
Kleinhovia hospita, Lin.
Waltheria indica, Lin.
Coriaria ruscifolia, Lin.
Eurya vitiensis, A. Gray.
Cardiospermum halicacabum, Lin.
Allophylus ternatus, Lour.
Euodia hortensis, R. and G. Forst.
Desmodium polycarpum, Cand.
Vigna lutea, A. Gray.
Erythrina indica, Lam.
Erythrina ovalifolia, Roxb.
Albizzia grandiflora, F. v. Muell.
Myrtus vitiensis, F. v. Muell. (Nelitris vitiensis, A. Gray.)
Colubrina asiatica, Brogn.
Phyllanthus ramiflorus, J. Muell.
Codiaeum variegatum, Blume.
Spiræanthemum samoense, A. Gray.
Schefflera vitiensis, Seem. (a variety with 7-merous fruit).
Loranthus insularum, A. Gray.
Plectronia barbata, J. Hook.
Mussaenda frondosa, Lin.
Blumea Milnei, Seem.
Bidens pilosa, Lin.
Scaevola koenigi, Vahl.
Tournefortia argentea, Lin. fil.
Premna integrifolia, Lin.
Clerodendron inerme, R. Br.
Cassytha filiformis, Lin.
Piper macgillivrayi, A. de Cand.
Trema camabina, Lour.
Pipturus argenteus, Wedd.
Casuarina equisetifolia, Forst.
Sarcochilus graeffei, G. Reich.
Joinvillea elegans, Gaudich.
Carex graeffeana, Baeck.
Fimbristylis communis, Kunth.
Rhychospora aurea, Vahl.
Panicum compositum, Lin.
Panicum sanguinale, Lin.
Panicum crus galli. Lin.
Imperata arundinacea, Cyril.
Cenchrus anomoplexis, Lab.
Eleusine indica, Gaert.
Centothera lappacea, Desv.
Paspalum scrobiculatum, Lin.
Coix Lacryma, Lin.

METEOROLOGY.

JANUARY, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sealevel corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lb. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	29·293	29·063	67	49	98·5	44·5	SW	10·41	0·05
2	29·450	29·363	67	46	104·0	42·0	SW S	8·33	0·02
3	29·829	29·776	68	48	100·0	41·5	NW NE SE	1·04	
4	29·965	29·933	80	48	118·0	42·5	NW SE	·52	
5	29·715	29·533	98	52	129·0	46·5	NW	15·89	
6	29·814	29·768	81	55	110·5	50·0	SE S	·104	
7	29·747	29·707	72	55	113·0	49·0	SW SE	8·07	
8	29·925	29·902	71	49	120·0	43·5	SE	·78	
9	29·926	29·728	81	46	117·5	40·5	NW SE	·52	0·15
10	29·600	29·448	79	50	115·0	54·0	NW SW	·52	0·12
11	29·567	29·554	67	51	102·0	48·0	NW SW	1·30	0·15
12	29·430	29·401	68	51	108·0	47·0	NW SW	5·72	0·10
13	29·385	29·313	62	46	102·5	43·0	NW SW	23·43	0·01
14	29·577	28·956	79	50	120·0	44·0	NW SW	13·02	0·01
15	29·445	29·329	76	51	106·0	45·0	SW NW	20·84	0·14
16	29·607	29·491	68	52	113·0	40·0	NW	3·64	
17	29·785	29·765	75	52	112·0	48·0	W	3·38	
18	29·784	29·732	87	55	123·0	50·0	NW SE	5·46	
19	29·805	29·691	96	61	123·0	50·0	SE NW	1·04	
20	29·839	29·757	92	65	91·0	57·5	NE SE	0·	0·04
21	29·812	29·549	89	65	122·0	58·0	W SE	0·	
22	29·583	29·513	100	67	130·0	60·0	NW SW	·78	
23	29·715	29·683	82	63	112·0	56·0	NW W	5·72	
24	30·002	29·968	74	54	110·5	48·0	SW S	8·33	
25	30·032	29·827	69	49	85·0	43·0	W NW	1·30	
26	29·810	29·741	69	56	94·5	46·5	SW SE	1·56	
27	30·132	30·047	69	47	104·0	42·0	SE	·78	
28	29·914	29·647	84	46	123·0	42·0	NW SE	6·25	
29	29·797	29·670	80	60	106·0	49·5	SE	1·30	
30	29·821	29·759	78	47	113·0	40·0	SW SE	1·56	
31	29·451	29·359	74	51	110·0	44·0	NW SW	1·56	
Monthly mean, 29·682			66·92		110·84	47·0,	Total force	158·70	0·79

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·682in., being ·062in. below the average.
Temperature mean, 62·92°, being 4·23° above the average.
Solar intensity mean, 110·84°, being 2·78° above the average.
Dew point mean, 49·0°, being 10·41° below the average.
Humidity of air mean, ·56, being ·11 per cent. below the average.
Elastic force of vapour mean, ·367, being ·006 per cent. below the average.
Total amount of rain, 1·79in., being 0·78in. below the average.
Increase of spontaneous evaporation on rainfall, 4·88in.
Mean amount of ozone, 5·75, being 1·18 of chromatic scale below the average.
Electricity active through the month, with only six nil, 42 positive and 14 negative.
fresh fall of snow on Mount Wellington on the 15th. The hottest day on the 22nd, 0° in the shade, 130° in the sun.

FRANCIS ABBOTT

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

th.—First Royal Apricot ripe.
th.—Jargonelle Pear ripe.
th.—Veronica Angustifolia in full flower.
18th.—Grevillea robusta, ditto.
25th.—Black Mulberry ripe.

Results of observations taken at New Norfolk for January, 1875:—

Barometer mean, of three daily readings, corrected and reduced, 29·738in.
Temperature, mean, of three daily readings, 63·39°.
Dew point, mean position of ditto, 48·92.°
Humidity mean of ditto, ·64.
Elastic force of vapour ditto, ·362in.
*Solar, intensity mean of maximum temperature, 131·5°.
Terrestrial Radiation mean of minimum temperature, 44·4°.
Rainfall, 1·57in.
Evaporation, 6·90in. ; in excess of rainfall, 5·33.
Clouds, mean amount of there daily observations, 4·3.
Ozone mean of two ditto, 7·7.
Wind, force in lbs. of three ditto, 111·42lbs.

*Taken with Cassella's improved vacuum self-registering thermometer with bulb and part of stem blackened.

W. E. SHOOBRIDGE, Valleyfield.

FEBRUARY, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lb. per square foot.	Rain in Inches.
	In.	In	°	°	°	°			
1	29·960	29·937	97	43	108·0	36·0	NW SE	1·30	
2	30·037	29·790	84	46	116·0	37·5	NW W	1·30	0·11
3	29·624	29·317	86	64	110·5	52·0	NW W	5·73	
4	29·930	29·729	80	50	102·0	40·5	S SW	6·25	0·67
5	30·063	30·042	75	42	110·0	36·5	NW SW	·78	0·1
6	30·224	30·186	80	52	111·0	42·0	SE	·52	
7	30·175	30·124	72	52	109·0	42·0	N NE SE	·52	
8	29·965	29.772	86	54	120·0	47·0	NW N	1·04	
9	29·676	29·523	110	66	120·5	62·0	NW NE	·26	0·18
10	29·891	29·815	102	55	115·0	50·0	NW S	·52	0·07
11	30·045	29·922	82	57	118·5	52·0	NE NW	1·04	
12	29·660	29·546	75	60	84·0	54·0	NW	·78	0·21
13	29·836	29·827	72	49	107·0	42·0	NW SW	1·56	0·10
14	29·873	29·852	79	54	116·0	45·5	NW	1·30	
15	29·924	29·824	78	49	110·0	42·5	NW SE	1·56	
16	29·945	29·879	69	52	107·0	46·0	NW SW	1·14	0·01
17	29·960	29·886	78	50	110·0	42·0	NW SW	1·56	0·02
18	30·121	30·039	71	55	94·5	48·5	NW SE	·26	
19	29·913	29·833	86	53	112·5	47·0	NW W	1·56	
20	30·037	30·013	78	58	75·0	44·5	NE SW	·52	
21	29·935	29·687	90	58	122·0	50·0	NW SE	1·30	
22	29·705	29·643	88	66	115·0	58·0	NW SW	3·64	0·01
23	29·937	29·924	75	48	110·5	42·0	NW SW	·78	
24	30·086	30·005	80	52	110·0	46·0	N SE	·78	
25	30·188	30·115	82	50	115·0	45·0	NW SE	·52	
26	30·160	30·113	77	53	91·0	48·0	SE SW	5·73	
27	30·279	30·204	79	51	103·0	42·0	N NW	·26	0·08
28	30·229	30·169	77	46	110·0	41·5	NW SE	·52	
Monthly mean 29·934			67·80		108·40	46·0	Total Force	43·03	1·47

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·934in., being 0·092in. above the average.
Temperature mean, 67·80°, being 5·69 above the average.
Solar intensity mean, 180·40°, being 0·80° above the ditto.
Dew point mean, 51·9°, being 1·39 above the ditto.
Humidity of air mean, ·60, being ·10 per cent. below the ditto.
Elastic force of vapour mean, ·409, being ·034 per cent. above the ditto.
Total amount of rain, 1·47in., being 0·06in. below the ditto.
Increase of spontaneous evaporation on rainfall, 3·49in.
Mean amount of ozone, 5·68, being 1·49 per cent. of chromatic scale below ditto.
Electricity active all through the month with 27 positive, 25 negative, and 4 nil, on the 12th.
Thunder and lightning on the 9th. The hottest day in the sun on the 21st, 122°. On the 9th, in the shade, 110°.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

4th.—Kerry Pippin Apple commencing to ripen.
6th.—Windsor Pear ditto.
9th.—Bon Chretien Pear ditto.
12th.—Green Gage ditto.
20th.—Ash commencing to shed seed.
24th.—Sycamore ditto.

Results of observations taken at New Norfolk for February, 1875 :—

Barometer mean of 3 daily readings, corrected and reduced, 29·969in.
Thermometer mean of 3 daily readings, 64·33°
Solar intensity mean of maximum temperature, 131·42°
Terrestrial radiation mean of minimum temperature, 44·74.
Dew Point, mean position, 52·8°.
Elastic force of vapour mean of 3 daily readings, ·415in.
Humidity mean of ditto, ·69.
Clouds amount of ditto, ·4·51.
Wind force in lbs. ditto, total 52·40lbs.
Rainfall, 1·97 inches.
Evaporation, 5·72in. in excess of rainfall, 3·75in.
Ozone mean, 7·35.

W. E. SHOOBRIDGE, Valleyfield.

MARCH, 1875.

Private Observatory, Hobart Town.

Day of month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	30·041	29·925	83	50	113·0	43·5	NW SE	1·04	
2	29·871	29·763	72	63	112·0	43·5	W SE	1·04	0·07
3	29·668	29·397	79	57	105·5	49·0	NW N SW	1·21	
4	29·910	29·642	69	52	98·0	50·5	NW SW	5·99	
5	30·079	30·053	75	45	110·0	39·0	N NW	7·80	
6	30·179	30·124	74	52	107·0	46·0	SW NW S	·52	
7	30·065	30·039	71	58	108·5	49·5	NE SE	·26	
8	30·007	29·878	96	59	112·0	52·0	SE	·52	
9	29·885	29·807	90	57	121·5	52·0	NW	1·04	
10	29·764	29·674	84	64	97·0	56·0	NW	·26	0·08
11	30.074	30·024	73	53	76·0	50·0	S SW	·78	0·05
12	29·924	29·876	68	53	87·0	49·0	NW SE SW	1·04	0·07
13	30·034	29·894	76	47	108·0	43·0	NW SE	1·30	
14	29·615	29·404	92	56	110·5	55·0	NW SW SE	10·42	0·03
15	29·706	29·665	66	44	98·0	40·0	NW SW	7·80	
16	29·880	29·796	70	55	97·0	50·0	NE NW	3·12	
17	29·917	29·859	77	46	108·0	41·5	NW SE	3·12	
18	29·886	29·847	76	49	108·0	43·5	SW W	·78	0·22
19	29·735	29·568	71	56	96·0	50·0	NW W	3·12	
20	30·065	29·948	72	46	89·5	40·0	SW	13·02	
21	30·077	30·030	70	46	102·0	42·5	NW	3·38	
22	30·079	29·967	69	50	101·0	45·0	NW SE	·78	
23	30·094	30·054	74	54	102·0	44·0	SW NW	·52	
24	30·196	30·151	76	51	107·0	44·0	NW SE	·52	
25	30·196	30·121	74	50	102·0	44·0	NW SE	·52	
26	30·076	30·001	76	52	108·5	47·0	NW NE SW	·26	
27	29·856	29·642	89	54	113·0	49·0	NW SW	10·42	
28	29·836	29·757	86	61	113·0	55·0	NW SW	1·04	
29	30·152	30·125	73	49	98·0	42·5	NW SE	·52	
30	30·214	30·165	71	48	98·0	42·5	NW SE	1·04	
31	30·176	30·129	74	55	104·0	50·0	NW SW SE	1·04	
Mean monthly 29·929			65·09		103·60	48·66	Total Force	90·82	0 52

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·929in., being ·052in. above the average.
Temperature mean, 65·09°, being 5·17° above the ditto.
Solar intensity mean, 103·60°, being 0·10° above the ditto.
Dew point mean, 50·4°, being 1·18° above the ditto.
Humidity of air mean, ·63, being ·08 per cent. below the ditto.
Elastic force of vapour mean, ·388, being ·031 per cent. above the ditto.
Total amount of rain, ·52in., being 1·08in. below the ditto.
Increase of spontaneous evaporation on rain-fall, 4·83in.
Mean amount of ozone, 5·18, being 1·93 of chromatic scale below ditto.
Mount Wellington covered with fresh snow on the 20th.

By analysing the table for March of the present year and that for April as far as it has gone, and comparing the results with those of the corresponding periods in former years, the increasing dryness of the seasons in Tasmania will be brought prominently under notice. To counteract this deficiency of moisture, irrigation would of course be the remedy, and fortunately our lakes and rivers afford every facility for carrying this out to any extent that might be required. If this, however, were found from any cause to be impracticable, it might be well to consider if planting trees on a large scale, as practised elsewhere, should not be now urged upon the attention of the public.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the Month of March, 1875.

10th.—Tips of Hornbean turning brown.
14th.—Coe's Golden Drop Plum ripe. Seckle Pear ditto.
17th.—Tips of Elm turning yellow.
20th.—Horse Chestnut leaves turning brown.
24th.—Ash leaves commenced to fall.
25th.—Oak ditto ditto.

The following are the results of the observations made at New Norfolk during the month :—

Barometer mean of three daily readings, corrected and reduced, 30·088in.
Thermometer mean of three daily readings, 61·57°.
Elastic force of vapour mean of ditto, ·388.
Humidity mean of ditto, ·72.
Dew point mean position, 51·3°.
Solar intensity mean of maximum temperature, 129°.
Clouds mean amount of three daily observations, 5·27.
Ozone mean of two ditto, 7·4.
Terrestrial radiation mean of minimum temperature, 43·41°.
Rainfall, ·58in.
Spontaneous evaporation, 5·32in. ; in excess of rainfall, 4·741
Wind force total of three ditto, 121·87 lbs.

Valleyfield. W. E. SHOOBRIDGE.

APRIL, 1874.
Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Bar. Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lb. per square foot.	Rain in inches.
	In.	In.	°	°	°	°			
1	30·129	30·090	65	46	102·0	40·0	NW SE	·26	0·12
2	29·834	29·663	82	49	108·0	44·0	NW SE	1·30	
3	29·815	29·704	75	54	99·0	49·5	W SE	1·04	0·02
4	29·970	29·930	64	50	75·5	45·0	S	1·04	
5	30·037	30·001	64	50	70·0	47·0	SW SE SW	1·04	
6	30·184	30·160	69	41	100·0	35·5	NW SE	·78	
7	30·345	30·328	71	42	99·5	37·0	NW SE	·52	
8	30·273	30·314	80	50	104·0	43·0	SE N	1·04	
9	30·192	29·943	84	49	109·5	45·0	NW	5·99	
10	29·865	29·783	82	57	109·0	50·5	SE	0.	0·26
11	29·635	29·585	71	56	85·0	52·0	NW	·52	0·28
12	29·895	29·591	72	48	92·0	41·5	SW NW	10·68	
13	30·174	30·133	68	42	98·5	36·0	NW SE W	·78	
14	30·265	30·164	64	38	88·0	31·5	NW	·78	
15	29·892	29·195	75	43	62·0	33·0	NW	20·84	0·16
16	29·976	29·895	72	42	71·0	34·5	S NW SW	3 12	
17	30·325	30·310	73	43	96·5	38·0	NW N	·78	
18	30·380	30·336	71	44	97·5	39·0	W SE	·52	
19	30·321	30·155	70	46	91·0	41·0	NW	·52	0·14
20	29·976	29·815	65	55	66·5	52·0	NW N	0·	0·42
21	29·775	29·726	61	55	69·0	50·0	S SW	3·12	0·03
22	30·072	29·942	58	46	78·0	38·5	NW SE S	·52	
23	30·116	29·945	70	41	93·5	35·5	NW N	1·04	
24	29·834	29·807	72	40	95·0	34·0	W NW	0·	
25	29·882	29·772	72	46	96·0	42·0	NW SE	·52	
26	29·712	29·551	78	53	95·0	47·0	NW SE	0·	
27	29·553	29·455	68	51	76·0	46·0	S NW SW	1·30	0·06
28	29·761	29·750	61	41	75·0	34·5	SW	3·38	0·06
29	29·932	29·851	62	39	84·0	32·0	NW SW	1·56	0·04
30	30·237	30·162	56	43	88·0	38·0	S SE	0·	
Monthly mean 29·847			60·20		89·0	41·10	Total Force ..	65·63	1·59

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·847in., being 0·065in. below the average.
Temperature, mean, 60·20°, being 4·87° above the ditto.
Solar intensity, mean, 89·0°, being 12·74° below the ditto.
Dew point mean, 48·7°, being 1·53° above the ditto.
Humidity of air mean, ·68, being ·08 per cent. below the ditto.
Elastic force of vapour mean, ·356, being ·027 per cent. above the ditto.
Total amount of rain, 1·59in., being 0·18in. below the ditto.
Increase of evaporation on rainfall 1·20in.
Mean amount of ozone 5·80, being 1·26 of chromatic scale below ditto.
Stroug southern lights on the 7th.
A fresh fall of Snow on Mount Wellington on the 15th.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Gardens during the month.

10th.—Elm leaves commence falling.
18th.—Coe's late red Plum ripe.
20th.—Chinese Chrysanthemums commenced to flower.
25th.—Mountain Ash leaves commenced to fall.
,, —Seeds of Hornbeam ripe.
30th.—Leaves of Black Mulberry falling.

Results of Observations taken at New Norfolk for April, 1875.

Barometer mean of three daily readings, corrected and reduced, 29·979in.
Thermometer mean of ditto, 55·30.
Dew point mean position at ditto, 49·4.
Elastic force of vapor, mean of ditto ·357in.
Humidity mean of ditto, ·83.
Solar intensity, mean of maximum temperature, 116·3.°
Terrestrial radiation, mean of minimum temperature, 37·3.
Rainfall, 1·88 inches.
Evaporation, 2·09in. in excess of rainfall, ·21.
Clouds, mean amount of three daily registers, 5·41.
Ozone, ditto of two ditto, 6·61.
Windforce in lbs. per square foot, at three observations, total 46·931bs.

W. E. SHOOBRIDGE, Valleyfield.

New Norfolk, April, 1875.

MAY, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37ft abv sea level, corrected and reduced. Highest.	Lowest.	Self-registering Thermometers. Highest in Shade.	Lowest in Shade.	Highest in Sun.	Lowest on Grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	30·358	30·328	64	39	86·0	34·0	W NW SE	0·	
2	30·399	30·345	68	43	93·0	38·0	NW NE W	·52	
3	30·371	30·348	60	47	81·5	38·5	N NE	0·	·02
4	30·287	30·161	58	51	70·0	42·0	NE SE E	1·04	·15
5	29·967	29·847	57	51	60·5	44·5	SE	·26	·94
6	29·629	29·626	56	52	58·0	45·0	NW SE	·52	1·50
7	29·441	29·350	65	48	79·0	43·0	SW W NW	·26	0·1
8	29·415	29·380	62	53	87·0	45·0	NW N	1·04	0·16
9	29·493	29·433	59	47	62·5	42·5	W NW N	0·	0·03
10	29·636	29·598	63	45	92·0	41·0	W SW SE	·52	0·08
11	29·656	29·580	57	47	70·0	42·5	NW	·26	
12	29·292	29·131	56	49	62·5	46·0	S SE	0·	0·14
13	29·077	29·041	56	42	78·0	40·0	NW	·78	0·01
14	29·369	29·311	59	41	85·5	35·0	NW SE	·52	0·16
15	29·709	29·422	56	37	62·0	31·5	SW S	6·25	0·15
16	30·040	30·006	55	36	66·0	31·0	NW W	·26	
17	30·139	30·060	60	35	85·0	32·0	W NW	·72	
18	30·184	30·140	59	50	60·5	44·0	W SE	0·	
19	30·245	30·186	62	47	84·0	41·5	NW SE	0·	0·02
20	30·195	30·121	69	47	90·0	42·0	NW SE	·26	
21	30·056	30·000	63	42	86·0	36·0	NW W	1·04	
22	29·733	29·558	60	43	87·0	37·0	W NW	3·38	0·16
23	29·948	29·811	61	40	77·0	32·5	SW	10·41	0·02
24	30·038	29·952	64	43	86·0	38·0	W NW	7·80	
25	30·285	30·264	63	45	89·0	40·0	NW SE	0·	
26	30·340	30·330	63	39	82·0	34·0	NW	·26	
27	30·082	30·049	60	40	79·0	34·0	NW	·78	0·01
28	30·075	30·002	59	43	65·0	32·5	S SW	0·	
29	29·974	29·895	54	34	70·5	28·0	N SW NW	5·47	0·01
30	29·863	29·556	67	45	87·0	36·0	W N NW	11·20	0·04
31	29·861	29·844	63	33	85·0	31·0	NW W	·52	
Monthly mean 29·867			53·27		77·63	36·0	Total Force...	53 87	3 61

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each veening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·867in., being 0·014in. below the average.
Temperature mean, 53·27°, being 2·65° above the average.
Solar intensity mean, 77·63°, being 4·53° below the ditto.
Dew point mean, 45·0°, being 1·14° above the ditto.
Humidity of air mean, ·76, being ·04 per cent. below ditto.
Elastic force of vapour mean, ·310, being ·006 per cent. below the ditto.
Total amount of rain, 3·61in., being 1·84in. above the ditto.
Increase of spontaneous evaporation on rainfall, 2·64in.
Mean amount of ozone, 5·10, being 1·85 of chromatic scale below ditto.

Mount Wellington covered with snow on the 14th. A fresh fall of snow on the mountain and low hills on the 15th with much squall from S.W. An additional fall of snow on Mount Wellington on the 23rd, with heavy squalls from S.W.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, during the month.

26th.—Coronilla glauca commencing to flower.
27th.—Ailanthus glandulosus leaves all fallen.
28th.—Photinia serrulata commencing to flower.
30th.—Diosma alba ditto.
31st.—Spiræa prunifolia ditto.

FRANCIS ABBOTT.

Results of observations taken at New Norfolk, for May, 1875:—

Barometer mean of three daily readings, corrected and reduced, 29·890in.
Thermometer mean of ditto, 49·95.
Dew point mean position at ditto, 46·90.
Elastic force of vapour mean of ditto, ·335in.
Humidity mean of ditto, ·91.
Solar intensity mean of maximum temperature, 106·6.
Terrestrial radiation mean of minimum temperature, 36·19.
Rainfall, 2·48in. in excess of Evaporation, ·51.
Spontaneous Evaporation, 1·97in.
Clouds mean amount of three daily registers, 7·11.
Ozone, ditto of two ditto, 7·7.
Windforce in lbs. per sq. ft., of three daily registers total 99·63lbs.

W. E. SHOOBRIDGE,
Valleyfield.

JUNE, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot	Rain in Inches.
	In.	In	°	°	°	°			
1	29·927	29·845	62	43	78·5	36·0	NW	·52	
2	29·950	29·[illegible]	67	45	88·0	38·0	W NW	·52	
3	30·076	30.026	65	43	76·0	36·5	NW S	·26	0·18
4	30·451	30·403	58	44	63·5	39·0	S SE	1·04	
5	30·559	30·489	57	45	81·0	39·0	NE SE	·0	0·05
6	30·460	30·383	53	45	65·5	41·5	SW SE	·0	0·04
7	30·195	30·037	55	47	60·0	42·0	S SE	·0	0·10
8	29·842	29.776	61	47	76·0	40.5	NW S	·52	
9	29·769	29·676	64	42	84·0	34·0	NW	·52	
10	29·931	29·840	62	41	83·5	35·0	NW S	·78	
11	29·750	29·683	61	40	80·5	32·0	NW	·52	
12	29·601	29·505	68	50	87·0	37·0	NW	·26	0·05
13	29·538	29·424	61	44	67·5	40·0	NW W	·78	
14	29·713	29·632	65	41	83·0	35·0	NW SW	·26	0·05
15	29·836	29·810	63	38	81·5	33·0	W NW	·52	
16	29·829	29·800	56	35	75·5	29·0	NW	·52	
17	29·957	29·942	31	38	72·0	32·0	NW	·52	
18	29.949	29·812	59	39	77·0	30·5	W NW	1·04	0·01
19	29·566	29·500	61	44	77·0	[illegible]	NW	·78	0·01
20	29·350	29·338	60	47	79·5	42·0	NW W	1·04	0·02
21	29·860	29·713	56	46	70·0	40·0	NW W	·78	0·27
22	29·768	29·630	60	46	66·5	40·5	NW	·52	
23	29·648	29·517	72	46	95·0	42.0	WN W	·26	0·45
24	29·516	29·280	64	45	75·0	42·0	W SW NW	·52	0.06
25	29·562	29·500	63	38	88·0	34·0	NW SW	3·12	0·01
26	29·711	29·642	58	42	78·5	35·5	NW W	3·38	
27	30·103	30·074	60	35	80·0	29·0	N W	·0	
28	30·277	30·098	59	36	79·0	28·5	NW SE	·52	0·12
29	30·163	30·095	55	41	76·0	34·0	S SE	1·04	0·05
30	30·214	30·187	53	43	82·0	37·0	S	1·04	
Monthly mean 29·838			52·80		77·55	36·40	Total Force	21·06	1·52

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·838in., being 0·053in. below the average.
Temperature mean, 52·80°, being 5·71 above the average.
Solar intensity mean, 77·55°, being 2·06° above the ditto.
Dew point mean, 45·0°, being 3·31° above the ditto.
Humidity of air mean, ·76, being ·07 per cent. below ditto.
Elastic force of vapour mean, ·301, being ·032 per cent. above the ditto.
Total amount of rain, 1·52in., being 0·28in. below the ditto.
Increase of rainfall on spontaneous evaporation, 0·30in.
Mean amount of ozone, 4·62, of chromatic scale, 1·99 below ditto.
Electric action for the month, 14 positive, 48 negative, and 17 nil.
Snow lying on Mount Wellington a great part of the month, with a few frosty mornings, and a thick, hazy atmosphere on several days.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

16th.—Maclaura aurantiaca leaves falling.
20th.—Privet leaves shedding.
25th.—Pyrus japonica commencing to flower.
26th.—Calycanthus præcot in full flower.
30th.—Black Mulberry leaves shed.

Results of observations made at New Norfolk during the month :

Barometer mean of three daily readings, corrected and reduced, 29·855in.
Thermometer mean of three daily readings, 47·07°.
Dew point mean, position of, 42·8.
Humidity mean, ·86.
Elastic force of vapour, ·275.
Solar intensity mean of maximum temperature, 101·7.
Terrestrial radiation mean of minimum temperature, 32·5.
Rainfall, 1·47in. in excess of evaporation 44.
Evaporation, 1·13in.
Ozone mean of two daily observations, 7·4.
Clouds, mean of three ditto, 5·8.
Windforce in lbs. per square foot, total of three daily registers, 38·87lbs.

W. E. SHOOBRIDGE, Valleyfield.

JULY, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37ft abv sea level, corrected and reduced. Highest.	Bar. Lowest.	Self-registering Thermometers. Highest in Shade.	Lowest in Shade.	Highest in Sun.	Lowest on Grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	30·254	30·194	56	35	78·0	31·0	NW	1·30	
2	30·219	30·184	55	37	77·5	33·0	NW	1·04	
3	30·214	29·998	58	37	81·0	28·0	NW	·52	·01
4	29·949	29·944	53	35	59·0	29·5	NW NS	·78	
5	30·064	30·050	52	40	64·0	35·0	S	·52	·83
6	30·268	30·224	58	36	79·0	30·0	NW	·52	·02
7	30·399	30·367	55	32	76·5	28·0	NW	·52	
8	30·372	30·341	59	35	81·0	28·5	W NW	1·30	
9	30·377	30·296	61	37	75·0	28·0	NW	·26	
10	30·342	30·318	64	45	85·5	41·0	NW SW	·78	·01
11	30·359	30·345	61	51	74·0	45·0	NW	1·56	
12	30·349	30·187	57	44	64·0	40·5	NW	1·04	
13	30·180	30·134	60	45	69·5	39·0	NW	·78	
14	29·956	29·845	58	41	60·0	35·0	NW	0·	·31
15	29·605	29·542	57	46	75·0	43·0	NW	1·30	·02
16	29·756	29·692	62	42	84·0	40·0	NW	3·38	·08
17	29·564	29·433	63	39	89·0	36·5	W NW	·26	·09
18	29·566	29·512	59	41	65·5	35·0	NW W SE	0·	
19	29·795	29·726	59	38	79·0	31·0	NW SW	1·04	
20	30·187	30·097	59	42	78·0	37·5	NW	1·56	
21	30·258	30·221	62	41	85·0	36·0	NW W	·26	
22	30·272	30·228	62	38	81·5	33·0	SW NW	·52	
23	30·271	30·184	60	36	79·0	32·0	NW	1·56	
24	30·211	30·124	59	36	85·5	32·0	W NW	·78	
25	30·217	30·068	56	33	80·5	30·5	NW	·78	·36
26	29·816	29·742	60	40	81·0	33·0	SW NW	·78	·04
27	30·100	30·064	55	41	75·0	35·0	S	·26	·18
28	30·264	30·215	53	40	55·5	34·5	SE S	·26	·01
29	29·858	29·702	55	42	75·5	36·0	S SE	3·38	
30	29·849	29·816	65	41	87·5	37·0	SE S W	0·	
31	29·873	29·824	62	45	86·5	39·0	NW	5·46	
Monthly mean 30·053			50·25		76·36	34·65	Total Force...	31·90	1·94

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 30·053in., being above the average, 0·206in.
Temperature mean, 50·25°, being 4·18° above the average.
Solar intensity mean, 76·36°, being 0·28° above the ditto.
Dew point mean, 41·8°, being 1·0° above the ditto.
Humidity of air mean, ·73, being ·09 per cent. below the ditto.
Elastic force of vapour mean, ·266, being ·008 per cent. above the ditto.
Total amount of rain, 1·94in., being 0·26in. below the ditto.
Increase of rainfall, on spontaneous evaporation 0·2in.
Mean amount of ozone, 4·35 being 2·75 of chromatic scale, below ditto.
Electricity *more* or *less* all through the month,—16 *positive*, 34 *negative*, 5 *nil*, on the 4th, 10th, and 14th.
Fresh snow on Mount Wellington on the 3rd, 20th, and 26th.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, during the month.

13th.—Arbutus unedo commencing to flower.
16th.—Garrya elliptica ditto
28th.—Almond in full flower.
31st.—White Mulberry commencing to start.
,, —Yellow Crocus in flower.

FRANCIS ABBOTT.

Results of Observations made at New Norfolk during the month :
Barometer, mean of three daily readings, corrected and reduced, 30·048in.
Thermometer, mean of 3 daily readings, 45·27°
Dew Point, mean of ditto, 41·01°.
Humidity mean of ditto, ·87.
Elastic force of vapour, mean of ditto, ·261.
Solar intensity, mean of maximum temperature, 101·48°.
Terrestrial Radiation, mean of minimum temperature, 29·29°.
Rainfall, 1·48in.
Evaporation, 1.41in.
Clouds, mean amount of three daily registers, 5·7.
Ozone, mean amount of two daily ditto, 7·4.

W. E. SHOOBRIDGE, Valleyfield.

AUGUST, 1874.

Private Observatory, Hobart Town.

Day of month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	30·258	30·224	58	35	73·0	31·5	W NW NE	·26	0·21
2	30·077	29·895	52	34	58·5	26·5	NW	·78	
3	29·712	29·656	67	43	90·0	36·0	NW	·52	
4	29·853	29·729	63	44	74·0	35·5	NW	0·	
5	29·509	29·493	59	42	71·0	36·0	NW W	0.	0·04
6	29·786	29·770	65	37	87·5	33·0	NW SE	·52	
7	29·760	29·680	61	32	86·5	27·0	NE SE	1·04	
8	29·806	29·738	59	44	89·0	36·0	W S	·52	0·01
9	29·830	29·794	61	36	75·0	28·5	W NW	·52	0·07
10	30·020	30·000	58	38	81·0	30·0	S	·26	0·3
11	30.130	30·082	59	32	85·5	28·0	NW E	·26	
12	29·980	29·792	58	32	83·0	26·5	W NW	·78	
13	29·739	29·704	65	36	88·0	28·0	W NW	·52	
14	29·656	29·567	65	45	91·0	38·5	NW	16·15	
15	29·425	29·338	66	53	89·0	42·0	NW	10·94	0·20
16	29·680	29·612	60	40	89·5	36·5	NW N	·78	0·01
17	29·884	29·758	64	41	89·5	37·0	S SE	·52	0·09
18	29·688	29·644	58	44	77·0	36·5	W SW	10·41	0·21
19	29·853	29·784	61	44	83·0	40·0	NW	1·30	
20	29·626	29·600	59	41	77·5	34·0	SW NW	1·56	0·41
21	29·722	29·694	55	38	78·0	32·0	SE SW	7·80	0·01
22	29·742	29·624	61	38	85·0	32·0	NW	1·04	
23	29·493	29·448	58	42	67·5	35·5	NW SW	3·12	0·03
24	29·632	29·600	72	38	76·0	33·0	SE S	1·04	0·21
25	29.872	29·849	63	35	91·0	30·0	NW	·52	
26	30·124	30·006	61	42	86·0	33·5	W NW SE	·26	
27	30·114	30·071	71	43	91·5	35·5	NW W	1·04	
28	30·203	30·110	70	40	94·5	40·0	NW	·52	
29	29·956	29·669	69	42	95·0	40·0	NW	6·25	0·08
30	29·435	29·380	62	50	68·0	40 0	NW	·52	0·08
31	29·506	29·441	59	42	61·5	37·5	NW SE	0·	
Mean monthly 29·782			52·37		81·69	34·30	Total Force....	70·05	1·69

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the Month.

12th—Sambucas niger commencing to break.
16th.—Horse Chestnut ditto.
17th.—Gooseberry ditto.
28th.—Elm commencing to flower.
29th.—Lombardy Poplar commencing to break.
30th.—Royal Apricot commencing to flower.

Barometer mean, 29·782in., being 0·038in. below the average.
Temperature, mean. 52·37° being 3·90° above the ditto.
Solar intensity, mean, 81·69°, being 1·13° below the ditto
Dew point mean, 39·9°, being 00·90° below the ditto.
Humidity of air mean, ·69, being ·10 per cent. below the ditto.
Elastic force of vapour mean, ·270, being ·001 per cent. above the ditto.
Total amount of rain, 1·69in., being 0·03in. below the ditto.
Increase of spontaneous evaporation on rainfall 1·07in.
Mean amount of ozone 3·75, being 3·81 of chromatic scale below ditto.
Electricity active through the month, positive 30, negative 27, and nil 5, on the 5th, 18th, and 24th. A fall of snow on Mount Wellington on the 1st—a fresh deposit on the 21st—an aurora on the eve of the 28th.

FRANCIS ABBOTT.

Results of Observations made at New Norfolk during the month :

Barometer mean of three daily readings, corrected and reduced, 29·771in.
Thermometer mean of ditto, 47·75.
Dew point mean position of 3 ditto, 38·50.
Elastic force of vapor, mean of 3 ditto ·233in.
Humidity mean of 3 ditto, ·73.
Solar intensity, mean of maximum temperature, 105°.
Terrestrial radiation, mean of minimum temperature, 32·12.
Rainfall, 1·93 inches.
Evaporation, 2·73in. in excess of rainfall, ·80in.
Ozone, mean of two daily observations, 7·46.
Clouds, mean of 3 daily observations, 5·87.
Wind, total force, 70·80lbs. per square foot.
Wind, horizontal movement, 2454 miles.
Electricity active on 8th, 10th, 12th, 14th, 23rd, 25th, and 26th.

W. E. SHOOBRIDGE, Valleyfield.

SEPTEMBER, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in inches.
	In.	In.		°					
1	29·428	29·418	55	41	84·0	38·0	SE S	3·38	0·62
2	29·538	29·446	55	37	85·0	38·5	NW SW	1·04	0·04
3	29·706	29·627	52	39	80·0	32·0	SW W	2·86	0·08
4	30·120	30·026	62	37	91·0	30·5	SW SE NW	·78	0·19
5	29·900	29·715	64	41	97·5	33·0	SW NW	5·72	0·09
6	29·821	29·687	68	47	94·0	36·5	NW W	·52	0·03
7	30·111	29·966	69	40	96·0	36·0	NW W	3·38	
8	29·654	29·317	72	40	86·5	34·5	NW	10·94	0·18
9	29·538	29·423	64	42	87·0	34·0	S SE NW	1·04	0·01
10	29·451	29·317	66	43	94·0	35·0	NW SW	20·84	0·03
11	29·764	29·726	60	42	83·5	33·5	NW W	1·30	0·05
12	29·693	29·553	60	45	85·0	33·0	SW	3·38	0·04
13	29·998	29·969	58	36	91·0	31·0	SW	1·56	0·01
14	30·176	30·162	63	35	95·0	31·5	NW SE	·26	
15	30·349	30·198	64	35	92·0	31·5	NW SE	·78	
16	30·061	29·821	62	40	94·0	35·0	NW	1·30	
17	29·948	28·924	64	41	96·5	36·0	NE SE	·26	0·06
18	30·001	29·915	67	38	101·0	34·5	NW SE	1·04	
19	29·950	29·835	67	39	95·5	32·5	NW	1·04	
20	29·682	29·644	70	46	104·0	38·0	NW SW	1·04	
21	29·630	29·493	64	40	92·0	34·0	NW	5·99	0·15
22	30·071	30·028	58	38	92·0	32·5	NW	5·46	
23	30·171	30·152	69	45	103·0	38·0	NW SE	3·12	
24	30·200	30·157	66	43	81·5	37·0	NW SW	·78	
25	30·291	30·252	72	42	103·0	34·5	NW SE	·78	
26	30·095	29·902	70	43	96·0	38·0	NW SW	3·38	0·12
27	29·733	29·604	68	50	77·5	34·0	NW	1·04	0·01
28	29·711	29·654	68	47	104·0	38·5	NW S SW	7·80	
29	29·562	29·430	68	44	88·0	35·0	SW W	26·05	0·10
30	29·770	29·737	62	40	97·0	33·0	NW W	3·64	
Monthly mean 29·819			56·02		92·22	34·47	Total force ...	121·01	2·01

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·819in., being 0·046in. above the average.
Temperature mean, 56·02°, being 4·50° above the ditto.
Solar intensity mean, 92·22°, being 2·77° above the ditto.
Dew point mean, 42·4°, being 0·16° above the ditto.
Humidity of air mean, ·62, being ·14 per cent. below the ditto.
Elastic force of vapour mean, ·278, being ·002 per cent. below the ditto.
Total amount of rain, 2·01in.
Increase of spontaneous evaporation on rain-fall, 1·25in.
Mean amount of ozone, 4·10in., being 0·19in. below the ditto.
Electricity, 45 *positive*, 15 *negative*, *nil* 0.

A covering of fresh snow on Mount Wellington on the 1st. Wind, snow, hail, and rain continuous on the 3rd. A fresh fall of snow on Mount Wellington on the 30th.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, during the month.

20th.—Ash commencing to break into leaf.
24th.—Grape vines commencing to start.
25th.—Oak commencing to break into leaf.
26th.—Moutan Peony commencing to flower.
30th.—Horse Chestnut ditto.
,, .—Robinia Pseudo Acacia commencing to start.

Results of Observations made at New Norfolk during the month :

Barometer mean of three daily readings, corrected and reduced, 29·947in.
Thermometer mean of ditto, 49·25°.
Dew point mean temperature of ditto, 39·10°.
Humidity mean of ditto, ·69.
Elastic force of vapour mean of ditto, ·240.
Solar intensity mean of maximum temperature, 115·30°.
Terrestrial radiation mean of minimum temperature, 32·30°.
Rainfall, 2·37in.
Evaporation, 4·64in., in excess of rainfall, 2·27in.
Ozone mean of two daily registers, 7·58.
Clouds mean of three daily registers. 5·06.
Wind total force of three ditto, 75·96 lbs. per square foot.
Wind horizontal movement, 2854 miles.
Electricity, 25 negative, 5 positive.

W. E. SHOOBRIDGE, Valleyfield.

OCTOBER, 1875.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			
1	29·600	29·538	58	45	65·0	40·0	NW SE W	·26	0·30
2	29·643	29·417	64	41	93·0	34·5	NW W	1·56	0·06
3	29·430	29·345	63	47	96·0	40·0	NW W	6·25	0·04
4	29·667	29·608	62	44	90·5	29·5	SW NW	16·15	0·54
5	30·015	29·945	61	43	93·0	34·0	SW NW	5·46	0·17
6	30·112	30·002	68	40	99·5	36·0	NW SE	1·56	0·02
7	29·718	29·563	78	49	107·0	37·5	SW S	10·94	0·30
8	30·048	29·984	62	43	90·5	36·0	S SE	1·04	
9	30 006	29·900	63	39	92·0	34·5	NW SE	·78	0·06
10	30·046	29·990	59	45	88·5	38·0	E SE	·78	0·03
11	30·245	30·193	61	46	101·0	40·0	SE	1·30	
12	30·145	29·932	70	45	101·5	39·5	NW	1·04	
13	29·767	29·606	77	46	109·0	43·0	NW S	5·20	0·09
14	29·475	29·235	77	47	108·0	44·0	NW N	5·47	0·04
15	29·383	29·352	73	46	99·0	40·0	W NW	13·02	0·01
16	29·433	29·250	66	44	99·0	40·5	NW SE	1·04	0·01
17	29·300	29·205	64	44	90·0	42·0	NW W	10·41	0·48
18	29·794	29·725	62	40	100·0	37·0	NW W	1·04	0·01
19	29·648	29·430	58	43	71·0	39·0	NW	5·21	0·35
20	29·826	29·758	59	40	60·5	36·0	SE SW	·78	0·01
21	30·015	29·942	61	43	100·0	40 5	SE	·78	0·01
22	30·140	30·078	63	39	102·0	35·0	NW SE	1·04	
23	30·042	30·015	61	45	90·0	40·0	NW S	·52	0·02
24	30·085	29·960	66	45	100·5	41·5	SE	1·30	0·02
25	29·871	29·815	64	50	90·0	45·0	NW SE	1·30	0·02
26	29·942	29·882	59	48	60·0	43·0	NW SE	0·	
27	29·884	29·848	65	45	99·0	43·0	NW SE	1·04	0·15
28	29·895	29·871	60	44	102·5	41·5	NW S	·78	0·04
29	29·993	29·937	60	38	99·0	32·5	S SE W	3·12	0·05
30	29·978	29·837	68	39	104·0	33·0	W N	1·30	
31	29·580	29·420	59	48	74·0	42·5	W N	·52	
Mean monthly 29·779			56·88		92·74	39·0	Total Force....	108·02	2·83

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·779in., being 0·001in. above the average.
Temperature mean, 56·88°, being 2·49° above the average.
Solar intensity mean, 92·74°, being 4·38° below the ditto.
Dew point mean, 45·5°, being 0·94° above the ditto.
Humidity of air mean, ·68, being ·05 per cent. below the ditto.
Elastic force of vapour mean, ·318, being ·005 per cent. above the ditto.
Total amount of rain, 2·83in., being 0·77in. above the ditto.
Increase of spontaneous evaporation on rainfall, 2·43in.
Mean amount of ozone, 4·26, being 3·67 of chromatic scale below the ditto.
Electricity active all through the month,—36 *positive*, 22 *negative*, and 4 *nil*, on the 1st and 19th.
Thunder and lightning on the 13th and 14th.
A fresh covering of snow on Mount Wellington on the 16th and 19th.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the Month.

12th.—Carpinus Betulus commencing to break
22nd.—Ailanthus Glandulosa ditto.
26th.—Lime Trees ditto.
30th.—Black Mulberry ditto.
31st.—Elm seeds falling.

Results of observations made at New Norfolk during the month :

Barometer mean of three daily readings, corrected and reduced, 29·763in.
Thermometer mean of three daily readings, 54·35.
Dew point mean, position of three ditto, 44·41.
Elastic force of vapour mean of three ditto, ·286.
Humidity mean of three ditto, ·68.
Terrestrial radiation, mean of minimum temperature, 37·61.
Solar intensity, mean of maximum temperature, 118·64.
Rainfall, 3·20in.
Evaporation, 5·25in., in excess of rainfall 2·05in.
Clouds, mean of three daily observations, 5·70.
Ozone, mean of two daily observations, 7·38.
Electricity,—52 negative, 3 positive, 7 nil.
Windforce in lbs. per square foot, total of three daily observations, 68·48lbs. Horizontal movement, 3065 miles.

W. E. SHOOBRIDGE, Valleyfield.

Rainfall at Hill station 1550 feet above sea level, 3·01in.

NOVEMBER, 1875.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot	Rain in Inches.
	In.	In	°	°	°	°			
1	29·428	29·306	70	50	110·0	41·5	S NW	·52	0·44
2	29·111	29·023	68	46	91·5	41·0	NW	3·38	0·01
3	29·144	28·967	65	45	97·0	37·0	N SW	13·02	0·10
4	29·332	29·202	62	42	103·0	33·5	NW W	8·33	0·30
5	29·380	29·303	75	48	110·0	44·0	W NW	13·02	0·03
6	29·166	29·050	72	55	100·0	51·0	NW S	11·46	0·10
7	29·627	29·585	65	45	98·5	40·5	W SW	5.72	0·01
8	29·615	29.538	65	49	98·0	43·0	NW SW	18·23	0·03
9	29·743	29·375	61	45	78·5	40·0	W N	·26	0·07
10	29·512	29·435	63	47	105·0	40.5	NW SW	6·25	0·25
11	29·846	29·829	66	42	100·0	39·0	NW	·26	0·01
12	29·721	29·537	84	53	110·5	42·0	NW	5·99	0·01
13	29·768	29·532	80	59	102·0	47·0	NW W	10·01	
14	29·776	29·730	72	48	107·0	43·0	NW SW	3·64	0·01
15	29·697	29·625	72	52	117·0	46·5	NW SW	3·32	
16	29·593	29·517	66	44	100·5	40·0	WN W	7·94	0·06
17	29·677	29·641	59	45	78·0	40·0	W S	2·60	0·03
18	29.541	29·470	66	46	106·0	43·0	NW SW	1·30	0·03
19	29·722	29·600	65	43	101·0	38.5	NW S	1·56	
20	29·693	29·565	59	42	74·0	38·0	NW SE	·26	0·40
21	29·657	29·561	57	48	65·5	40.0	S	8·17	0·04
22	29·891	29·818	66	47	109·0	44·0	SE	·78	0·02
23	29·667	29·600	66	47	105·0	43·5	W NW	1·04	0·07
24	29·688	29·364	61	47	87·5	43·0	NW SE	·0	0·10
25	29·625	29·605	69	47	106·0	40·0	SW NW	3·64	
26	29·849	29·794	71	51	110·0	40·0	SW NE	1·04	
27	29·909	29·694	79	45	113·5	42·5	NW SE	1·04	
28	29·551	29·434	78	57	97·0	47·0	NW NE S	·52	
29	29·630	29·488	79	45	116·5	42·5	NE SW	5·21	
30	29·613	29·509	74	46	110·0	42·0	NW	3·12	0·16
Monthly mean 29·548			60·50		100·45	41·78	Total Force	144·99	2·28

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·548in., being 0·417½in. below the average.
Temperature mean, 60·50°, being 2·83° above the average.
Solar intensity mean, 100·45°, being 1·46° below the ditto.
Dew point mean, 46·80°, being 0·31° above the ditto.
Humidity of air mean, ·63, being ·07 per cent. below ditto.
Elastic force of vapour mean, ·333, being ·007 per cent. above the ditto.
Total amount of rain, 2·28in., being 0·50in. below the ditto.
Increase of spontaneous evaporation on rainfall, 3·95in.
Mean amount of ozone, 4·17, being 3·33 of chromatic scale, below ditto.
Electricity active all through the month, mostly positive, with strong and fluctuating winds.
A fresh covering of snow on Mount Wellington on the 4th and 19th.

FRANCIS ABBOTT.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

21st.—First ripe Strawberry gathered.
25th.—Ditto ditto Cherry (May Duke) ditto.
28th.—Black Mulberry in blossom.
The flowering of *Punica plœna* and *Bougainvillea spectabilis*, and the ripening of raspberries fully ten days later this season than usual.

Results of Observations made at New Norfolk during the month :

Barometer, mean of three daily observations, corrected and reduced, 29·587 inches.
Thermometer, mean of three ditto, 56·00°.
Elastic force of vapour, mean of three ditto, ·299.
Humidity, mean of three ditto, ·66.
Dew point, mean position of three ditto, 45·21°.
Solar intensity, mean of max. temperature, 121·60°.
Terrestrial radiation, mean of min. temp., 38·36°.
Rainfall, 3·23 inches.
Evaporation, 5·90 inches, in excess of rainfall, 2·67in.
Clouds, mean amount of three daily registers, 5·84.
Ozone, mean amount of two ditto, 7·01.
Wind, force in lbs. per square foot, amount of three ditto, 102 lbs. total.
Wind, horizontal movement, 3410 miles.
Electricity, 52 observations : 39 negative, 3 positive, 10 nil.

W. E. SHOOBRIDGE,
Valleyfield.

Rainfall at Hill Station, 1550 feet above sea level, 4·04 inches.

DECEMBER, 1875.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37ft abv sea level, corrected and reduced. Highest.	Lowest.	Self-registering Thermometers. Highest in Shade.	Lowest in Shade.	Highest in Sun	Lowest on Grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.			°				
1	29·164	28·979	68	44	99·0	40·0	NW	1·04	0·15
2	29·612	29·520	63	45	101·5	40·0	SW SE	12·92	0·40
3	29·770	29·487	68	47	107·0	42·5	SW NE	13·54	0·09
4	29·435	29·351	66	48	103·0	43·5	NW SW	13·02	0·16
5	29·333	29·257	66	43	104·0	41·5	NW SW	5·72	0·05
6	29·244	29·133	67	45	100·5	40·0	NW SE	5·72	0·05
7	29·283	29·255	62	40	98·0	37·0	NW SE	·26	0·05
8	29·771	29·641	61	46	98·0	42·5	SE	5·72	0·82
9	29·884	29·800	72	40	110·0	37·5	NW SE	·52	0·02
10	29·929	29·924	68	52	82·5	44·0	SE	·78	0·02
11	29·874	29·777	63	48	72·0	43·0	NW S	0·	0·25
12	29·738	29·624	63	48	68·0	42·5	SW S	·52	0·58
13	29·430	29·377	67	49	92·5	41·5	SE S	·52	1·80
14	29·680	29·552	61	51	95·5	45·0	SW SE	3·12	0·28
15	29·889	29·821	59	49	85·5	44·5	N SE	·52	0·02
16	30·029	30·016	64	50	97·5	45·0	SE S	·78	0·08
17	30·267	30·215	70	48	110·0	44·5	SE	·52	
18	30·165	30·116	77	51	114·0	45·0	N SE	1·04	
19	30·152	30·105	84	57	112·5	50·5	NW	0·	
20	30·289	30·223	83	56	111·0	50·5	NW SE	·52	
21	30·240	30·166	95	60	130.0	51·0	W SE	·52	
22	30·111	29·909	88	58	122·0	50·0	NW N	·78	
23	29·799	29·637	89	57	119·0	51·5	W N	1·30	0·01
24	29·671	29·630	77	63	112·5	58·0	SW SE	3·38	0·01
25	29·653	29·625	73	61	110·0	57·0	SE	·26	0·06
26	29·559	29·510	71	58	71·5	54·5	SE S	·26	
Monthly mean 29·737			63·85		101	45·52	Total Force...	75·46	9·00

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 30 years' standard tables are used for obtaining the difference from the average.

Barometer mean, 29·737in., being 0·011in. below the average.
Temperature mean, 63·85°, being 2·66° above the average.
Solar intensity mean, 101°, being 3·82° below the average.
Dew Point mean, 53·8°, being 4·89° above the average.
Humidity of air mean, ·71, being ·04 per cent. above the average.
Elastic force of vapour mean, ·426, being ·073 above ditto.
Total amount of rain, 9in., being 7·19in. above ditto.
Increase of rainfall on spontaneous evaporation, 4·09.
Mean amount of Ozone, 4·08, being 2·03 of chromatic scale below ditto.

The above abstract is taken from a series of records which have extended over the last 35 years without intermission. Results of these observations for 30 years, embodying all the elements usually recorded hitherto, have been previously published by the Royal Society of Tasmania in three separate parts. It has now, however, been determined to commence a new series of observations more in accordance with forms which have recently been adopted for Meteorological purposes.

FRANCIS ABBOTT

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

20th.—Common Privet commencing to flower.
24th.—First bunch Red Currants ripe.
30th.—Ditto Black ditto ditto.
31st.—Melia Azederach commencing to flower.
,, —Doyenne d'Ete Pear ripe.
,, —Juneating Apple commencing to ripen.

Results of observations taken at New Norfolk during the month :—

Barometer, mean of three daily readings, corrected and reduced, 29·713in.
Thermometer, mean of 3 daily readings, 61·30°.
Solar intensity mean of maximum temperature, 123·54.
Terrestrial Radiation, mean of minimum temperature, 44·06.
Dew point mean position of, 3 daily readings, 51·50.
Elastic force of vapour of ditto, ·379.
Humidity of ditto, ·70.
Rainfall, 5·91 inches, in excess of evaporation, ·61in.
Evaporation, 5·30in.
Cloud, mean amount of three daily registers, 6·08.
Ozone, two ditto, 6·88.
Wind, total force in lbs. per square foot, 84·47lbs.
Ditto, horizontal movement, 2,883 miles.
Electricity, 47 observations, 26 negative, 11 positive, 10 nil.

W. E. SHOOBRIDGE,
Valleyfield.

Rainfall at Hill Station, 1,550ft. above sea level, 10·12in.

MONTHLY MEANS OF OBSERVATIONS TAKEN AT NEW NORFOLK FOR 1875.

Latitude, 42° 46′ 48″ S. Longitude, 147° 4′ 45″ E.

Months.	*Barometer.*	*Thermometer.*				*Humidity of Air.*			*Condensation*		*Evaporation.*	*Ozone.*	*Clouds.*	*Winds.*	
	At Temperature 32°.	*Mean Temperature.*	*Mean Diurnal Range.*	*Mean Solar Intensity.*	*Mean Terrestrial Radiation.*	*Dew Point Mean Position.*	*Humidity of Air per 100.*	*Elastic Force of Vapour per 1000.*	*Rain in Inches.*	*No. of days on which Rain fell.*	*Spontaneous Evaporation in Inches.*	*Mean Daily Amount*	*Mean Daily Amount.*	*Prevailing Direction.*	*Force in lbs. per square foot.*
		°	°	°	°	°						SCALE 0·10	SCALE 0·10		
January	29·738	63·39	26·30	131·50	44·40	48·92	·64	·362	1·57	10	6·90	7·70	4·30	W SE	111·42
February	29·969	64·33	25·70	131·42	44·74	52·80	·69	·415	1·97	7	5·72	7·35	4·51	W	52·40
March	30·088	61·57	26·30	129·00	43·41	51·30	·72	·388	·58	9	5·32	7·40	5·27	W SE	121·87
April	29·979	55·30	22·66	116·30	37·30	49·40	·83	·357	1·88	11	2·09	6·61	5·41	W NW	46·93
May	29·890	49·95	16·25	106·61	36·19	46·90	·91	·335	2·48	17	1·97	7·70	7·11	W NW	69·63
June	29·855	47·07	17·36	101·70	32·50	42·80	·86	·290	1·57	10	1·13	7·40	5·87	W NW	38·87
July	30·056	45·27	18·60	101·48	29·29	41·10	·87	·262	1·48	14	1·41	7·40	5·70	W	39·88
August	29·771	47·75	19·00	105·00	32·12	38·50	·73	·233	1·93	12	2·73	7·46	5·87	W	70·80
September	29·947	49·25	21·89	115·30	32·30	39·10	·69	·240	2·37	18	4·64	7·58	5·06	W SW	75·96
October	29·763	54·35	19·83	118·64	37·61	44·41	·68	·286	3·20	19	5·25	7·38	5·70	W	68·48
November	29·587	56·00	21·66	121·60	38·36	45·21	·66	·299	3·23	25	5·90	7·01	5·84	W SE	102·00
December	29·713	61·30	20·51	123·54	44·06	51·50	·70	·379	5·91	21	5·30	6·88	6·08	SE W	84·47
Sums	358·356	655·53	256·06	1402·09	452·28	551·94	8·98	3·846	28·17	173	48·36	87·87	66·72		882·71
Mean for 1875	29·863	54·62	21·33	116·84	37·69	45·99	·75	·320	2·34	14·41	4·03	7·31	5·56	W SE	73·56
Mean for 1874	29·912	54·90	18·47	*115·5	40·67	49·31	·83	·362	1·75	11·3	3·55	7·71	5·95	W SE	†83·8

* Mean of 3 months. † Mean of 6 months. Total Rainfall, 1874, 23·04in. Evaporation, 42·62in.

W. E. SHOOBRIDGE.

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA,

FOR THE YEAR

1875.

TASMANIA:

PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.

1876.

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*G. KREFFT, Esq., F.L.S., C.M.Z.S., &c., &c., Sydney.

PROFESSOR G. NEUMAYER, Munich.

*REV. JULIAN E. T. WOODS, F.L.S., F.G.S. F.R.G.S., &c.

DR. W. O. SONDER, Foreign Hon. Sec. Society of Naturalists, Hamburg.

REV, J. J. BLEASDALE, D.D., F.G.S., Melbourne.

*LIEUT. W. V. LEGGE, R.A., F.Z.S., M.R.A.S., Ceylon.

CAPTAIN O'REILLY, Brisbane, Queensland.

R. BROUGH SMYTH, Esq., Secretary for Mines, Melbourne.

PROFESSOR JOHN AGARDH, M.D., University of Lund, Sweden.

DR. JULIUS HAAST, F.R.S., Director of Museum, Christchurch, New Zealand.

ARCHIBALD LIVERSIDGE, Esq., F.G.S., Professor of Geology and Mineralogy in the Sydney University.

PROFESSOR W. HARKNESS, U.S.N., United States Naval Observatory, Washington.

HENRY HAYLIN HAYTER, Government Statist, Melbourne.

*FREDERICK M. BAILEY, Esq., Brisbane, Queensland.

A. THOZET, Esq., Botanist, Rockhampton, Queensland.

COMTE DE CASTELNAU, Consul-General for France, Melbourne.

List of Fellows and Members.

* Fellows who have contributed papers which have been published in the Society's Transactions. † Denotes Life Membership.

*Abbott, Francis, F.R.A.S., F.R.M.S. ...	Hobart Town
*Abbott, E., jun.	"
Adams, G. P.	"
*Agnew, J. W., M.D., V.P.	"
Allport, Joseph	"
*†Allport, Morton, V.P., F.L.S., F.Z.S., Corresponding Member of the Anthropological Institute of Great Britain, Life Member of the Entomological and Malacological Societies, and Foreign Member of the Royal Linnean and Royal Botanic Societies of Belgium	"
Aikenhead, Hon. J., M.L.C.	Launceston
Adams, R. P., Solicitor-General	Hobart Town
Aubin, Mrs. F.	"
Bilton, H.	Glenorchy
†Barry, Sir R.	Melbourne
*Barnard, James	Hobart Town
Butler, Francis	"
Butler, J.	"
*Bromby, Right Rev. C. H., D.D., Lord Bishop of Tasmania	"
Bright, R. S., M.R.C.S., Eng....	"
Butler, Henry, F.R.C.S., Eng.	"
Buckland, H. J.	"
Browne, Justin McC.	"
Baynton, W. E.	Kingston
Briant, G. W.	Hobart Town
Barclay, C. J.	"
Bedford, W....	Anstey Barton
Belstead, C.	Hobart Town
Browne, N. J.	Meadow Banks, Glenora
Bidencope, J.	Hobart Town
Butler, E. H.	"
Broughton, Jas.	New Town
Chapman, Hon. T. D., M.L.C....	New Town
Cook, Henry...	Hobart Town
Clarke, J. M.	"
Creswell, C. F.	"
Cotton, Francis	Swanport
Crawford, Lieut.-Colonel	Hamilton-on-Forth
Crosby, W.	Hobart Town

Clarke, J. K.	Hobart Town
Cruttenden, Thomas	Woodsden
Coote, Audley	Sandy Bay
Cowle, Miss	Hobart Town
Crowther, A. B., M.R.C.S., Eng.	,,
Crosby, R.	,,
Davies, Ven. Archdeacon, V.P.	,,
Dobson, His Honor Mr. Justice	,,
Dobson, H.	,,
Dowdell, C.	,,
Davies, R. L.	,,
Elliston, C.	,,
Fysh, Hon. P. O., M.H.A.	,,
Giblin, Thomas	,,
*Gould, C., F.G.S., late Govt. Geologist	London
†Gunn, R. C., F.R.S., F.L.S....	Launceston
Graves, J. W.	Hobart Town
†Gellibrand, Hon. W. A. B., M.L.C.. Hon. Member Leeds Institute	River Ouse
Grant, C. H....	Hobart Town
Gellibrand, Miss	,,
*Hall, E. Swarbreck, M.R.C.S., Eng. ...	,,
Harris, Rev. R. D. P., M.A.	,,
Hunter, Henry	,,
Huybers, A.	,,
Hazell, C.	Carlton
Howell, F. G.	Hobart Town
Hopkins, A.	,,
Hammond, W. S....	,,
Irving, M. H., M.A., &c.	Melbourne
Irvine, P.	Hobart Town
†Jeffery, Molesworth	Bournbank, Lachlan
Jackson, Hon. J. A., M.H.A.	Hobart Town
*Johnson, R. M.	Launceston
Kennerley, Hon. Alfred, M.L.C.	Hobart Town
Knight, W. jun.	,,
Kelsh, Rev. Thomas	New Norfolk
Kermode, W. A.	Mona Vale
Lewis, David, M.H.A.	Hobart Town
Legge, R. V....	Cullenswood
Lucas, R. J.	Hobart Town
Latham, G. H.	,,
Lovett, W., Col. Auditor	,,
Lewis, J. Kenrick, M.R.C.S. Eng.	,,

Langdon, Capt. W., R.N.	Hobart Town
Maclanachan, James	Ballochmyle
Macfarlane, James	Hobart Town
Macfarlane, J.	,,
Mather, J. B.	,,
Maxwell, C. M.	,,
*†Milligan, Joseph, F.L.S.	England
Moore, J. A., M.R.C.S., Eng.	New Norfolk
Meredith, Hon. C., M.H.A.	Hobart Town
Morrison, Askin	,,
Marsh, H. J....	,,
Mace, Rev. J. C....	Glenorchy
†Mace, G.	Spring Bay
Morris, W. V.	Hobart Town
Napier, G. R.	,,
*Nowell, E. C.	,,
Officer, Hon. Sir Robt., M.H.A., Speaker V.P.	New Norfolk
Pillinger, J.	Antill Ponds
Perkins, H. A., M.D., M.R.C.S., Eng. ...	Hobart Town
Roberts, H. L.	,,
Read, R. Cartwright	Redlands, New Norfolk
Rule, J....	Hobart Town
Riddoch, A., M.H.A....	New Norfolk
Roblin, T., Curator of Museum	Hobart Town
Reynolds, W. J. J.	,,
Salier, G., M.H.A.	,,
Sharland, W. S.	New Norfolk
Seal, M....	Hobart Town
Smith, His Honor Sir Francis, Chief Justice	,,
†Solomon, Joseph	,,
*Stephens, T., M.A., F.G.S., Inspector of Schools	,,
Story, Dr. J. F.	Swanport
Storie, Rev. J.	Hobart Town
*Scott, J. R., M.L.C....	New Town
Salier, F. J.	Hobart Town
*Swan, J.	New Town
Smith, P. T....	Hobart Town
*Shoobridge, W. E.	New Norfolk
Shoobridge, E.	,,
Spicer, Rev. W. W.	Hobart Town
Simson, A.	Brighton
Scott, Hopton	Hobart Town
Swan, E. D.	,,
*Travers, S. Smith	New Town

Walch, James H. B.	Hobart Town
Weaver, G.	,,
Whyte, Hon. James, M.L.C.	,,
Wilson, George	Mount Seymour
Wilson, Hon. Sir J. M., M.L.C., President of Legislative Council	Hobart Town
Wise, F. H.	,,
Webster, A. G.	,,
Wright, Stephen P. H.	Glenorchy
Westbrook, T.	Bellerive
Wilson, J.	Ashgrove, Oatlands
Walker, Mrs. R.	Hobart Town
Young, Russell, M.H.A.	,,

MINUTES of the ANNUAL GENERAL MEETING of the ROYAL SOCIETY OF TASMANIA, held at the Museum, Macquarie-street, at half-past 7 o'clock p.m., on the 28th January, 1876, Morton Allport, Esq., V.P., in the chair.

The CHAIRMAN having read the advertisement by which the meeting had been convened, called upon the Secretary to read the Report.

The Report for 1875 was then read.

It was moved by Mr. RULE, seconded by Dr. LEWIS, and carried :—"That the Report be adopted, and printed for circulation amongst the Fellows."

The SECRETARY having reported that the retiring Members of Council were the Right Rev. Bishop Bromby, the Ven. Archdeacon Davies, Dr. Agnew, and Mr. M. Allport, it was resolved on the motion of Dr. PERKINS, seconded by Mr. NAPIER, that they should be re-elected.

It was proposed by Dr. AGNEW and seconded by Mr. BARNARD, that Mr. Barclay be elected Treasurer of the Society, in the room of Mr. Dunn, who had left the colony. Carried.

Messrs. H. Cook and John Macfarlane were unanimously re-elected as Auditors of Annual Accounts, and a vote of thanks was accorded to them for their services during the past year.

Comte de Castlenau, Consul-General for France at Melbourne, was elected a Corresponding Member of the Society.

The following gentlemen were ballotted for and elected Fellows of the Society:—Messrs. Charles Elliston, W. S. Hammond, Hopton Scott, and Captain Audley Coote.

THANKS.

Mr. Webster proposed that the thanks of the Society be accorded to Dr. Agnew, Hon. Secretary, and Mr. Roblin, Curator, for the valuable services they had rendered to the Society.

Mr. Barnard seconded the motion, and had great pleasure in testifying to the efficient and untiring manner in which those gentlemen had discharged their duties.

The Chairman put the motion, which was carried unanimously.

Dr. Agnew returned thanks on behalf of himself and Mr. Roblin. He briefly reviewed the work of the Society during the past year, and, in alluding to the value of the contributions, remarked that the year on which they were entering would perhaps be equally successful. Since last General Meeting fourteen Fellows and two Corresponding Members had been admitted, a very large number for our small community. (Applause.)

The Meeting then terminated.

REPORT.

The session of 1875 opened on the 9th March with a paper by the Rev. J. E. Tenison Woods, F.L.S., F.G.S., F.R.G.S., etc., " On some Tertiary Fossils from Table Cape.

The following papers were brought forward at the various subsequent meetings:—" On some new species of Tasmanian Marine Shells," by the Rev. J. E. Tenison Woods, F.G.S., etc.; " On the Fossil Genus Fenestella," by the same; " On the Frilled Lizard *(Chlamydosaurus kingii)* of Queensland," by Dr. G. Bennett, F.Z.S., F.L.S.; " On the beautiful Sponge from the Philippine Islands known as Venus' Flowerbasket *(Euplectella aspergillum)*," by the same. " Further notes on the Salmon Experiment," by M. Allport, F.L.S., F.Z.S.; " On the Freshwater Shells of Tasmania," by the Rev. J. E. Tenison Woods, F.Z.S., etc.; " Account of a Visit to Port Davey," by the Hon. J. R. Scott, M.L.C. " On the Vital Statistics of Tasmania," by E. C. Nowell, Esq., Government Statistician. " On the Queensland Grasses," by F. M. Bailey, Esq., Corresponding Member of the Society. " On some new and hitherto underscribed shells of Tasmania," by the Rev. J. E. Tenison Woods, F.G.S., etc. " A census of the plants of Tasmania," by Baron F. von Mueller, C.M.G., M.D., F.R.S., etc.

The names of the authors of the above papers are sufficient guarantee for their value. Most of the papers have already been published, others will appear immediately, and it may safely be said that at no former period of the Society have papers of higher value and interest ever appeared in our proceedings. The special thanks of the Society are due to the Rev. J. E. Tenison Woods for the vast trouble he has taken in describing and classifying various collections of our shells ; and as this description could not have been well accomplished without the invaluable assistance of Mr. Legrand, (see Mr. Woods' remarks at the November meeting) our cordial thanks are justly due to that gentleman also.

Our old and highly esteemed correspondent, the Baron Ferd. von Mueller has laid the Society under the deepest obligation by his learned and elaborate "Census of the Plants of Tasmania," a work which will be invaluable for all time as a standard of reference. The best thanks of the Society are also due to Dr. G. Bennett, of Sydney, for his valuable contributions, both to our publications and Museum, and we are greatly indebted to Mr. F. M. Bailey, of Queensland, for his paper on the grasses of that colony, and for his presentation (noticed elsewhere) to the Museum.

In addition to the papers above referred to communications on the following subjects have been read and brought under discussion during the session, viz. "On the occurrence of the 'Reed Warbler,' (*Calamoherpe Australis*) in Tasmania," from E. D. Swan, Esq. "On the desirability of steps being taken to prevent the destruction of the Blue Gum (*Eucalyptus globulus*) in the Colony," from A. K. Chapman, Esq. "On the improvement of the Domain," from J. Sayce, Esq. ; and on the same subject, from the Superintendent of the Botanic Gardens. "On the locality whence the Tasmanian Aborigines obtained the stone from which their cutting implements were formed," from J. Scott, Esq., M.H.A. ; etc., etc.

The monthly meetings have been very well attended, and the chair has on several occasions been occupied by His Excellency, the President.

As will be noticed in the printed list, donations of books to the library have been numerous. Among other donors may be mentioned Sir Robert Officer, the Rev. J. E. Tenison Woods, the Secretary of State for India, the Malacological and Entomological Societies of Belgium, the Department of Agriculture, United States; Dr. G. Bennett, of Sydney; the Superintendent of the Geological Survey of India, the Trustees of the British Museum, the Royal Academy of Sciences, Munich; Baron F. von Mueller, the Royal University of Norway; His Highness the Maharajah of Travancore, the Director Meteorological Office, Calcutta; the Director Meteorological Office, Canada; Hon. J. Whyte, Esq., M.L.C.; Dr. J. Hector, of New Zealand; Captain F. W. Hutton, etc., etc.

Mr. F. Abbott and Mr. W. E. Shoobridge have carried on the meteorological observations with their usual zeal and accuracy, and the superintendents of the various lighthouses have forwarded their returns as heretofore. The Hobart Town table for December completes a series of observations extending over five years, and when this is added to the published abstract for 30 years we shall have an uninterrupted record extending over 35 years. Certain changes in the meteorological observations are now being made in order to assimilate them more closely to those of Europe, America, etc. Forms for these have been executed at the Government Printing Office.

As usual our thanks for the conveyance of parcels, etc., free of cost, are due to the Tasmanian Steam Navigation Company, and to several of our merchants. Of the latter Messrs. W. Crosby and Co., Macfarlane Bros., and Belbin and Dowdell have particularly favoured us during the past year.

Thanks are also due to Messrs. Walch and Sons, for the gratuitous distribution of the Society's publications to members residing in the country.

COUNCIL.

No vacancy has occurred during the year. The list of retiring members has been posted in the library for the last three days, in accordance with No. 32 of the amended rules of the Society.

FINANCE.

The income from all sources was as follows :—Government Grant-in-aid of Museum, £200 ; ditto, of Gardens, £400 ; subscriptions, £153 ; from Marine Board, £20 ; sale of plants, etc., at Gardens, £111 6s. ; this with £30 12s. in the hands of the Superintendent of the Gardens for payment of wages and £20 arrears of subscriptions will give a total of £934 18s.

The expenditure as per balance sheet was £932 2s. 10d., leaving a balance to credit of £2 15s. 2d.

We greatly regret to say that although the usual notices have been forwarded, some members have not yet paid their subscriptions for the past year, and several are even in arrear for former years.

GARDENS.

In last year's report it was stated that in all probability the new entrance would be ready for opening in a few months. This expectation has not yet been realised, as up to the present time our efforts to procure suitable gates have been unsuccessful. This is much to be regretted as it is generally felt that the present entrance is exceedingly inconvenient, and at the same time out of character with the place. It is to be hoped that the completion of this public entrance will not be much longer delayed.

As usual many new plants and seeds have been introduced. From Mons. J. Linden, of Ghent, Belgium, was received a fine collection of cool-house orchids and palms, which arrived in good condition. Valuable donations of plants have also been received from the Botanic Gardens, Adelaide, Melbourne, and New Zealand, and from nurserymen in the neighbouring colonies. From the Chamber of Agriculture, Washington, a fine collection of Conifers and other forest trees was received. Advices have also been had from Mons. J. Verschaffelt, of Ghent, Belgium, of the dispatch of a very valuable case of plants, consisting of a selection of what are known as pictorial trees, and 50 varieties of the best Rhododendrons extant.

The number of visitors to the Gardens during 1875 is estimated at 38,837.

MUSEUM.

Many objects of interest have been acquired during the year. Deserving special mention is the collection of gigantic Fossil Marsupials from Darling Downs, Queensland, the gift of Dr. G. Bennett, of Sydney. To the same donor we are indebted for the two specimens of the Euplectella, which have attracted so much attention. Mr. W. Legrand, with great liberality, presented type specimens of the new Marine and Freshwater Shells described by the Rev. J. E. Tenison Woods.

Hitherto we have been unable to make any satisfactory display of our shells, but a number of well-arranged show cases are now being constructed, which will enable the entire collection to be properly arranged and exhibited.

The Rev. W. W. Spicer has rendered most valuable service by naming, arranging, and mounting the various collections of dried plants in the Museum. The European and Tasmanian portions of the Herbarium have already been completed, and Mr. Spicer purposes to proceed with the arrangement of the remainder as opportunities offer.

It gives us great pleasure again to acknowledge our obligations to Mrs. C. Meredith, who has not only executed for us, in her usual artistic manner, several original drawings, but afterwards very kindly undertook the trouble of transferring them to stone.

The number of visitors to the Museum during the year was 15,015.

STATEMENT OF FUNDS OF THE ROYAL SOCIETY OF TASMANIA for the Year 1875.

RECEIPTS.	£ s. d.	£ s. d.
Annual Subscriptions from 97 Members	145 10 0	
Arrears of ditto	7 10 0	
Amount received from Marine Board for clerical assistance in completing Meteorological Tables from Lighthouses	20 0 0	
TOTAL ROYAL SOCIETY		173 0 0
Museum—Grant-in-aid from Treasury	..	200 0 0
Botanic Gardens—Grant-in-aid from Treasury	400 0 0	
,, Proceeds of sale of Plants, Fruit, &c.	111 6 0	
TOTAL BOTANIC GARDENS		511 6 0
Jan. 19th, 1876.		
Balance overdrawn at Commercial Bank	..	47 16 10
		£932 2 10
NOTE.—*Dr.*—To overdrawn Balance at Bank	..	£47 16 10
Cr.—By Cash in hands of Superintendent of Botanic Gardens for payment of Wages	30 12 0	
Subscriptions due	20 0 0	
		50 12 0
Balance to Credit	..	£2 15 2

Jan. 19th. EXPENDITURE.	£ s. d.	£ s. d.
Balance overdrawn at Commercial Bank, as per statement for 1874	..	45 16 0
Interest on overdrawn account, June 30th £1 3s. 7d., Dec. 31st £1 2s. 6d.	..	2 6 1
Stamped Cheque Books	..	0 16 8
ROYAL SOCIETY.—Meteorological Instruments	2 0 0	
Printing and Advertising	63 0 6	
Postage, Parcels, &c.	5 7 2	
Collector's Commission	7 13 0	
Messenger	1 0 0	
Clerical assistance for completing Lighthouse Meteorological Tables	20 0 0	
Library Books, Stationery, &c.	46 3 2	
TOTAL ROYAL SOCIETY		145 3 10
MUSEUM.—Salary of Curator	125 0 0	
Wages of Attendant	52 0 0	
Insurance	6 7 6	
Purchase and Preparation of Specimens	10 12 6	
Water Rate	3 2 8	
Fuel and Light	4 4 7	
Paper for Herbarium	5 0 0	
Sundries and Petty Cash	1 3 3	
Camphor, Spirits of Wine, &c.	7 0 9	
Ironmongery, Brushware, &c.	3 3 0	
Freight and Carriage of Specimens	0 18 0	
Fittings, Repairs, &c.	8 4 8	
TOTAL MUSEUM		226 16 11
BOTANIC GARDENS—Salary of Superintendent	150 0 0	
Wages of Labourers	254 17 0	
Tools and Repairs (blacksmith)	12 6 5	
Freight and Carriage of Plants	8 8 6	
Stationery and Stamps	5 10 6	
Forage	11 19 7	
Ironmongery	20 6 8	
Flower Pots	8 1 0	
Repair of Buildings, Timber, &c.	4 7 2	
Water Rate	2 1 8	
Sundries	27 3 10	
Seeds	6 1 0	
TOTAL BOTANIC GARDENS		511 3 4
		£932 2 10

31st January, 1876.

Examined and found correct { HENRY COOK, JOHN MACFARLANE } Auditors.

BOOKS PURCHASED & PRESENTED DURING 1875.

[*Presentations marked thus* *]

Arts, Journal of Society of, current numbers.
Agricultural Gazette, The, ditto.
Athenæum, The, ditto.
*Acclimatisation Society of France, Extract from Bulletin of, 1872-3.
*Aborigines, Tasmanian, On the osteology and peculiarities of. By Dr. J. Barnard Davis, F.R.S. From the author.
*Animal Kingdom, Tables of the Affinities of the. By Prof. Reay Greene.
*Botanic Garden, Imperial of St. Petersburg, Publications of, Tome II. From the Director.
British Association, Report of, 1873.
Conchologia Iconica, Nos. 318 to 321.
*Colonial Institute, Royal, Proceedings of, 1873-4. List of Fellows, and copy of Regulations. From the Institute.
*Catalogues, Book, sundry. From Quaritch, London.
*Colonies, The, current numbers. From the Editor.
*Cobden Club, Proceedings of the, 1874 (Bastiat on Political Economy). From the Club.
*Catalogues, British Museum; Birds, Vol. 1, and Hand List of Seals. From the Trustees.
*Census of New Zealand, 1874. From N.Z. Government.
*Diamond Field, The Bingera, pamphlet on, by Prof. Liversidge, Sydney. From the Author.
*Engineers and Shipbuilders in Scotland, Institution of, Proceedings, Vol. 18, 1874-5. From the Institution.
*Euplectella Sponge, On the. By Dr. G. Bennett, F.L.S., C.M.Z.S., &c., Sydney. From the Author.
*Flora Australiensis, Bentham, 6 Vols. From Sir Robert Officer.
Florist and Pomologist, The, current numbers.
*Florule des environs de Han-sur-less. By F. Crepin. From the Author.
Feathers, Stray (Indian Ornithology) Vol. 2, part 6; Vol. 3 parts 1 to 4.
*Ferns, Queensland, Handbook of. By F. M. Bailey. From Rev. J. E. Tenison Woods.
*Flora of British India, The, parts 1, 2, and 3. By J. D. Hooker, C.B. From the Right Hon. the Secretary of State for India.
*—— of Queensland, Parliamentary Paper on Herbarium of.
Fruit Manual, Hogg's.
*Fossil Mammals of Australia, On the. By Prof. Owen, F.R.S. From Dr. G. Bennett, F.Z.S., Sydney.
*Fenestella, On the Fossil Genus. By Rev. J. E. T. Woods, from the Author.
*Guide to Exhibition Rooms, British Museum. From the Trustees.
Gardeners' Chronicle, current numbers.
*Geology of Queensland, Notes on. By R. Daintree, F.G.S. From Rev. J. E. T. Woods.
*———— of Otago, New Zealand. By F. W. Hutton, F.G.S., C.M.Z.S., and G. H. F. Ulrich, F.G.S. From Captain F. W. Hutton, Provincial Geologist.

Geology, Principles of. By Sir Chas. Lyell. New Edition.

*Geological Survey of Victoria, Progress Report of, No. 2. From R. Brough Smyth, Esq.

*————————,' Prodromus of Palæontology of Victoria, Decades 1, 2. By Prof. McCoy. From Government of Victoria.

———————— of India, publications of. From the Government of India.

————Magarine, Nos. 131 to 136.

*Geomys and Thomomys, the Genera of. By Dr. Elliott Coues, United States Army. From the Author.

*Grasses, On the Queensland. By F. M Bailey. From the Author.

*Hortus Kewensis, 2nd Edition, 1814 (Aiton). From the Rev. J. E. Tenison Woods.

*Historical and Archæological Association of Ireland, Royal, Annual Vols, of, for 1872-3. Journal of, Vol. 2, Nos. 13 to 16; Vols. 3, Nos. 17 to 19. From Dr. Agnew.

*History of Colony of New South Wales. By Governor Collins. 2nd Edition, 1804. From the Hon. Jas. Whyte, Esq., M.L.C.

*Iron and Coal Deposits, Wallarawang, New South Wales, on the. By Prof. Liversidge, Sydney University. From the Author.

Journal, Quarterly of Science. Current numbers.

————, American of Science, Sillimans, Vol. 18, Nos. 46 to 48.

*Journey, Overland from Lake George to Port Phillip, Humes. From the Rev. J. E. T. Woods.

*Journals of Legislative Council, Tasmania. From H. M. Government.

*Lizard, On the Frilled, of Queensland. By Dr. G. Bennett, F.Z.S. From the Author.

Magazine, Country Gentleman's. Current numbers.

*Minerals, On New, from New Caledonia. Nickel Minerals from ditto. Dendritic Spots on ditto. Meteorite, the Deniliquin or Baratta. Four Papers by Prof. Liversidge, Sydney University. From the Author.

*Mining for Gold and Coal, On. By J. Wood Beilby. From the Author.

*Magnetic Declination, Observations on, made at Trevandrum and Agustia Malley Observatories. From His Highness the Maharajah of Travancore.

*Meteorology. Quarterly Weather Report, part 4, 1871. Instructions for Meteorological Telegraphy, 1875. Report of Conference on Maritime Meteorology, 1874. Data for square 3 (Lat 0·10 N., Long. 20·30 W.) Meteorological Congress at Vienna, 1874, Report of. Quarterly Weather Report, 1873, part 4, 1874, part 1. Instructions for use of Meteorological Instruments, 1875. Meteorological Committee, Royal Society, Report of part 1, 1874. From the Meteorological Office, Board of Trade, London.

*Meteorological Office, Calcutta, publications of; viz., Meteorological Reports, Bengal, 1867-1874. Administration Reports, 1870-1875. Report of Midnapore and Burdwan Cyclone of October, 1874. From the Government of India.

*Meteorological Observations, Canada, Report of, Supplement No. 4, 1874. Results of Observations at Toronto, 1841-1874. From the Director.

*——————— Observations, Melbourne, Results of. From R. J. L. Ellery, Esq. Tables for 1875, Vol. 2, 1873. Monthly.

*——————— ————, Hobart Town, Monthly Tables, 1875. From F. Abbott, F.R.A.S., F.R.M.S.

*——————— ————, New Norfolk, Ditto. From W. E. Shoobridge.

*——————— ———— for Mount Nelson, S. Bruni, Goose Island, Swan Island, Kent's Group and King's Island. From the Hobart Town Marine Board.

*——————— ————, Sydney. Tables for 1875, and Results of Observations for 1873. From H. C. Russell, B.A., F.R.A.S.

*——————— ————, New Zealand. From Dr. J. Hector, F.R.S. Monthly tables from various stations, January to July, 1875. Ditto from Wellington, February to October, 1875.

——————— ————, Brisbane, Queensland. Monthly Tables, January to November, 1875. From E. McDonnell, Esq., Government Observer.

Natural History, Annals and Magazine of. Current numbers.

Nature. Current numbers.

*Norway, Royal University of. Publications for 1872, 1873, 1874.

*Orange, The, Introduction of, into New South Wales. By Dr. G. Bennett, F.L.S., F.Z.S. From the Author.

*Plantarum, Genera. Hooker and Bentham. Vol. 1, parts 1, 2, 3.

*———— vascularium genera, 1836-1843. C. F. Miesner.

*———— Helvetiæ (Icones) 1813. J. C. Wyttenbach.

*Phytographia Australiæ Fragmenta, Vol. 8. By Baron F. von Mueller, C.M.G., M.D., F.R.S., &c. From the Author.

*Plants, Papuan, Descriptive Notes on. By the same. From the Author.

*——— of Tasmania, Census of. By the same. From the Author.

*Port Davey, Account of a visit to, in 1875. By the Hon. J. R. Scott, Esq., M.L.C. From the Author.

*Palæontologique, Fragments, pour servir a la flore du terrain houiller de Belgique. By François Crepin. From the Royal Museum of Natural History, Brussels.

*Plants, &c., used as food by the Aboriginals of Northern Queenslend. By A. Thozet. From the Rev. J. E. Tenison Woods.

*Reports of Mining Surveyors, Victoria, 1874-5. Ditto of Chief Inspector of Mines, 1874. From the Secretary for Mines, Victoria.

*Reports, Annual, Department of Agriculture, United States, 1871-2-3. From the Commissioner of Agriculture.

*Report, 9th Annual of Colonial Museum and Laboratory, Wellington, New Zealand. From Dr. J. Hector, F.R.S.

*———, Meteorological, New Zealand, 1873. From the same.

*———, of Conference of Government Statistics, held in Tasmania, 1875. From H. H. Hayter, Esq.

*Society, Royal, London. Proceedings Vol. 22, No. 155; Vol. 23, Nos. 156 to 163. From the Society.

*————, New South Wales. Proceedings, 1872-3. From the Society.

*————, Victoriæ, Transactions, Vol. 2. From Society.

*————, Asiatic, Journal of, Vol. 7, part 1. From Society.

*————————, Japan Branch, Vol. 3, part 1. From the Society.

*————, Geographical, Journal of, Vol. 43, and Proceedings, Vol. 18, Nos. 2 to 5. From the Society.

*————, New South Wales, Address to, 1875, by Rev. W. B. Clarke. From the Author.

*——, Malacological of Belgium. Proceedings of, 1873-4. From the Society.

*——, Entomological of Belgium. Transactions of, 1874. From the Society.

*——, Royal Astronomical, Memoirs of, Vol. 40, 1874-5. From the Society.

*——, Geological, Quarterly Journal of, Vol. 30, Nos. 118 120. From the Society.

*——, Zoological and Acclimatisation of Victoria, Proceedings of 1875. From the Society. Ditto from Baron F. von Mueller.

*————————, of London, Proceedings of part 3, 1873, parts 1, 2, 3, 1874.

*——, Linnean, Journal of, Vol. 14, Nos. 75 to 77 (Botany). Vol. 12, No. 58, Zoology. List of, 1874. Additions to Library, 1874. Proceedings, 1874. From the Society.

*——, Meteorological, Quarterly Journal of, Nos. 13, 14, 15. From the Society.

*Statistics of Victoria, 1874-5. Statistical Register, parts 1, 2, 3, 1875. From H. H. Hayter, Esq.

*———— Tasmania, 1874. From E. C. Nowell, Esq.

*————————, on the Vital. By E. C. Nowell, Esq. From the Author.

*Silk, On the Cultivation of, in New South Wales. By Dr. G. Bennett, F.Z.S. From the Author.

*——, On. By C. Brady, F.L.S. From the same.

*Sciences, Royal Academy of, Munich. Publications of, 1872. From the Academy.

*——, Academy of Natural, Philadelphia. Proceedings of parts 1, 2, 3, 1874.

*Sedimentary Formations in New South Wales, Remarks on. By the Rev. W. B. Clarke, M.A., F.G.S. From the Author.

*Salmon experiment, Further Notes on. By M. Allport, F.L.S., F.Z.S., &c., &c. From the Author.

*Shells, Freshwater of Tasmania, on. By the Rev. J. E. Tenison Woods, F.G.S., F.L.S., F.R.G.S., &c., &c. From Author.

*——, of Tasmania, On some undescribed Marine. By the same. From the Author.

*Technological Museum, Melbourne—Lectures delivered at, 1872. From the Rev. J. E. T. Woods.

*Victorian Year Book, 1874. By H. H. Hayter, Government Statist, Victoria. From the Author.

PRESENTATIONS TO MUSEUM DURING 1874, WITH NAMES OF DONORS.

Allport, M., Esq.—A small Black Snake. A Diamond ditto.

Allen, Mr., Port Cygnet.—An Opossum *(Phalangista fuliginosa).*

Anderson, Mr. C.—A young Snake, probably *Hoplocephalus superbus.*

Blackman, F. A., Esq.—2 Snakes, 1 Lizard, 1 Bat, 1 large Beetle, and a collection of Land and Freshwater Shells from Warro, Port Curtis, Queensland.

Brown, N. J., Esq., M.H.A.—Specimens of Opalised Wood from Meadow Banks.

Buckland, Mrs.—A framed Portrait of the late Sir Henry Young.

Bidencope, Mr. J.—Samples of Felt in various stages of preparation for Hat-making.

Butler, R., Esq.—Young Snake *(Hoplocephalus curtus).*

Bennett, Dr. G., F.L.S., Sydney. Specimen of the *Didunculus strigirostris.* Ditto of Frilled Lizard of Queensland *(Chlamydosaurus kingii.)* Two ditto of silicious skeletons of the Sponge from the Philippine Islands, known as Venus' Flower Basket *(Euplectella aspergillum).* A collection of bones of fossil Mammals from Gourie Creek, Darling Downs, Queensland, viz. *Fossil Kangaroo,* 16 Vertebræ, 7 fragments of Pelvis, 8 of Tibia, 1 of Radius, 2 of Humerus, 1 of Scapula, 2 of Femur, 2 of Jaw, 2 Bones of Foot, 1 of Sternum, and 5 Ribs. *Fossil Wombat;* 1 Upper Jaw, 2 Vertebræ, and 1 Radius. *Diprotodon;* Portion of Skull, lower jaw, 9 Vertebræ, 10 Ribs, 1 Humerus, 4 Fragments of Pelvis, 1 do of Tusk. *Nototherium;* 1 Jaw.

Bailey, Mr. J., Oatlands—Cast Skin of Snake.

Bealey, Mr.—A Pelican (*Pelecanus conspicillatus*), from George's Bay.

Baynton, W. E., Esq., Kingston.—Stone Implements of Tasmanian Aborigines.

Browne, Justin McC., Esq.—A Sample of Virgin Olive Oil, made at Adelaide, S.A. A collection of Tasmanian Copper Tokens.

Banning, Mr., East Bay Neck.—A very large Egg of Domestic Fowl.

Brock, Mr., Campania—2 Specimens Fossil Wood.

Bailey, Mr. F. M., Brisbane.—A named Collection of Queensland Grasses.

Crawford, Col.—Sample of Tin smelted from Mt. Bischoff Ore.

Clarke, J. K., Esq.—Specimens of Quartz, with penetrating crystals of Rutile, from N.S. Wales.

Chapman, A. K., Esq.—Specimens of a species of Fluke taken from a large Diamond Snake.

Calder, J. E., Esq.—A Collection of Bones of Native Animals, taken from a Cave, Glenorchy.

Chisholm, Mr. D., Forcett.—Casts of Roots, from Five Mile Beach.

Cotton, Mr. E. P., Swansea.—A Young Tippet Grebe *(Podiceps australis).*

Crawford, Mr. J.—A Sample of Flax grown at the Huon, and prepared by the donor.

Davies, Mr. F. J.—Samples of Tin, Antimony, Silver and Copper Ores, from Stanthorpe, Queensland.

Dry, Lady.—A young Cuckoo.

Dyer, Mr. B. R.—A Hooded Dottrell *(Ægialites monacha)*. Specimen of the Frost Fish *(Lepidotus caudatus)*, washed on shore at Battery Point.

Fergusson, Mr. J., Tinder Box Bay.—A Crab. 2 Egg Cases of Ray.

Graves, J. W., Esq.—A Bivalve Shell *(Crassatella castanea)* from North Coast. Fossil Wood from Risdon. A Fossil *(Pacchydomus sacculus)* from limestone beds, Bridgewater. A Ring-tailed Opossum *(Phalangista viverrina)*.

Groom, F., Esq., Harefield, St. Mary's.—An unusually large specimen of the sharp-nosed Eel.

Genge, Mr. Thos.—Nine Eggs of Common Pheasant, from an abandoned Nest at Sandy Bay.

Gard, Mr. E., Sorell.—A Ferret, killed in a bed-room of a Farmhouse, at Cherry Tree Opening, after attacking and severely biting a sleeping boy.

Harris, Mr. R. J., Sorell.—A large Black Snake *(Hoplocephalus curtus)*, killed on the Cambridge Road.

Hancock, Mr. D., O'Brien's Bridge.—A fine specimen of *Spirifer bisulcata*, from slope of Mt. Wellington.

Hall, Mr. C. H., Mt. Bischoff.—Specimens of Tin Ore, Lode Tin, Galena, Antimony, &c.

Hissey, Mr., Skin of " White Bird " *(Chionis necrophaga)* from Kergulen's Land. Minute Shells from Stomach of a Mullet. 4. Specimens of young of Bandicoot *(Perameles obesula)* from the pouch.

Hull, Master H.—Egg of "Native Companion," or Australian Crane *(Grus australasianus)*.

Hooper, Mr.—A young Cuttle Fish, taken from the Stomach of a Fish.

Huston, Dr.—An Opossum Mouse *(Dromicia gliriformis)*.

Hogg, Mr. C. E.—Specimen of the paper-like Bark of a species of Tea Tree, from Lake Hindmarsh, Victoria.

Jonah (Native Teacher), Samoa.—A Model of a Samoa Canoe. A large Sheet of Tapa Cloth.

Judd, Mr. H.—A peculiar Spider, found among Tree Ferns.

Japanese Commissioners, Melbourne Exhibition. Sections of Japanese Woods, named, and mounted in book form.

Kermode, W. A., Esq.—Two samples of Salt from Salt-pan Plains, Mona Vale.

King, Mr.—A Tiger Cat *(Dasyarus maculatus)*.

Lloyd, Mr. H. G., New Norfolk.—Three pieces of Wood, and 3 of Fossil Wood from Queensland.

Luckman, Mr. E., Sorell.—An albino Opossum *(Phalangista fuligimosa)*; 2 Brush Wattle Birds *(Anthochœra mellivora)*. 3 Species of *Epthianura albifrons*.

Lovett, W., Esq.—A Sooty Oyster-catcher *(Hæmatopus fuliginosus)*.

Lindsay, Mr. J. G., Launceston.—Specimen of Lewin's Water Rail *(Rallus brachipus)* prepared and mounted.

Morton, C. E., Esq.—A Species of a large species of " Walking-Leaf Insect " from Grafton, N.S. Wales.

May, Mr. W. L.—Curious Marine Incrustation on Shell of Pecten, from Frederick Henry Bay.

Macfarlane, J., Esq.—Two Specimens of the Stems of the "Glass-rope Sponge," from Japan.

Maclanachan, Hon. J., Esq.—A Mountain Duck *(Casarca tadornoides).*

Miller, Mr. J.—A young Kangaroo, from the pouch.

Mezger, Mr. J.—A Port Jackson Shark *(Cestracion philippi).*

Meredith, Mrs. C.—Water-color Drawings of Fossil Shells from Table Cape.

Prescott, Mr.—Two specimens of the "Gladius" or "Pen" of a species of squid *(Loligo sp.*

Peacock, Mr. G., Sorell. A Nankeen Kestrel *(Tinnunculus cenchroides).* An albino variety of the common Pipit Lark *(Anthus australis).*

Parsons, Mrs.—Albino variety of the Opossum. A White Hawk, A Beaver Rat. A Bandicoot. An Antechinus. A Petrel.

Parker, Mr., Lewisham.—A specimen of "Arching" of branch of Gum Tree.

Quinlan, Mr.—A Pouched Lamprey *(Geotria allporti).*

Radcliffe, Mr.—Specimen of *Ibacus peronii* from East Coast, Tasmania.

Reynolds, Capt.—Tail of Species of Ray.

Read, R. C., Esq.—Two species of *Antechinus albipes.*

Reibey, Rev. Thos.—Bronze Medal of Captain Cook, 1792, found on one of the Society Islands.

Simpson, J., Esq.—Sample of Stream Tin from Mt. Horror.

Spong, Mr. E. N.—A Collection of Sponges, Rock Specimens, Telegraph Cable, relics from Wrecks, etc., etc., from King's Island.

Swan, E. D., Esq.—Nest and Egg of Reed Warbler. *(Calamoherpe australis.)*

Salier, F.—A large Crab from Howe's Island.

Stanfield, Master. A Black-cheeked Falcon *(Falco melanogenys).*

Scott, J. R., Esq., Hon.—Sample of Coal from Pebbly Beach, Port Davey.

Stump, Mr.—A $\frac{1}{8}$ Dollar, Mauritius, 1820.

Swan, J., Esq.—Two specimens of Native Bread *(Mylitta australis).*

Thorne, Mr., Forcett.—A Tippet Grebe *(Podiceps australis).*

Weld, F. A., Esq., C.M.G., His Excellency. 24 Named Specimens of West Australian Woods. A Japanese Mirror. Two Ear-bones of Dugong. Two Lizard from W. Australia. A Collection of Nets and other Implements made by the Aborigines of W. Australia.

Woods, Rev. J. E. Tenison, F.G.S., F.R.G.S., etc.—3 Specimens of Gold from Devonian Rocks, Gympie, Queensland. A named collection of Queensland Ferns.

Wintle, Mr. S. H.—Iron Ores, Limestone and Coal, from River Don. Bismuth from Mt. Ramsay. Tin bearing wash dirt, porphyry, cassiterite on sandstone, etc., from George's Bay. Skin of an Echidna.

Weeding, Mr. C., Eastern Marshes.—2 Native Cats. 1 Tiger Cat. 6 Stone Implements of Tasmanian Aborigines. Specimen of Native Bread.

Walker, Dr. W.—A large and very rich Specimen of Copper Ore from N. S. Wales.

Wilson, Miss, Hampden Road.—Specimen of "Copper Moss" from Swansea, Wales. Water-color Drawing of Hobart Town in 1820.

Young, Master J. C.—Two Mats from Fiji. A Basket made by Fijian Chief. The First Copy of the earliest Newspaper struck off in Fiji. An Indian Hunting Knife. Shells from Great Barrier Reef.

PLANTS RECEIVED AT THE ROYAL SOCIETY'S GARDENS DURING 1875.

January 9th.—From A. G. Webster, Esq.—8 packets seeds.

January 14th.—From Lady Rolle, Bicton, England.—19 packets seeds.

January 14th.—From Ch. Huber, France.—23 packets seeds.

January 22nd.—From the Botanic Gardens, Melbourne.—18 packets Indian seeds.

February 12th.—From the Department Agriculture, Washington, United States.—41 packets seeds.

March 2nd.—From Wm. Bull, London.—12 Tuberous Begonias.

March 2nd.—Jules Cock and Sons, France.—25 packets seeds.

March 5th.—From North China Branch Royal Asiatic Society.—Box bulbs.

March 9th.—Mr. A. Simpson.—4 Queensland Dendrobiums.

April 29th.—From Messrs. Macfarlane Bros.—10 packets seeds, from China.

May 1st.—Rev. W. W. Spicer, Hobart Town.—40 packets seeds.

May 1st.—From Baron Ferd. von Mueller.—2 packets seeds.

May 15th.—From Department of Agriculture, Washington.—40 packets seeds.

May 15th.—From Colonel Crawford.—4 packets seeds.

May 21st.—From Mr. E. B. Heyne, Adelaide.—200 packets seeds.

May 25th.—From Mr. C. Hollinsdale.—21 packets seeds.

May 31st.—From Mr. F. Johnston.—Seeds of 5 species Palms.

June 16th.—From His Excellency, F. A. Weld, Esq., C.M.G.—15 packets Conifer seeds.

June 28th.—From Mr. G. Brunning, Melbourne.—Case containing 80 plants.

June 30th.—From Mr. A. Simpson.—Plants of Todea and Dicksonia.

June 30th.—From the Rev. W. W. Spicer.—Plants of Sedums.

July 30th.—From the Botanic Gardens, Christchurch, N.Z.—46 plants.

July 31st.—From Mr. J. Latham, Hobart Town.—Seeds of Anemones and Ranunculus.

August 4th.—From Capt. W. Willet.—74 packets seeds, imported.

August 6th.—From the Dobroyd Nursery, Sydney.—32 plants.

August 20th.—From Mr. E. B. Heyne, Adelaide.—8 packets seeds.

August 23rd.—From Messrs. Shepherd and Co., Sydney.—60 plants.

September 4th.—From Mr. Wm. Davis, Sandy Bay—80 packets seeds, from Fiji.

September 30th.—From the Botanic Gardens, Christchurch, New Zealand.—30 plants.

October 9th.—From Mons. J. Linden, Ghent, Belgium. 110 Orchids and Palms.

October 16th.—From the Botanic Gardens, Adelaide.—30 plants.

October 18th.—From Ch. Huber, France.—9 packets Primula, 4 Morus Alba.

November 5th.—From Mr. C. F. Creswell, Melbourne.—49 packets seeds.

November 10th.—From the Japanese Commissioners.—12 packets seeds.

November 17th.—From Mr. C. Hollinsdale.—32 plants.

November 18th.—From Capt. A. Coote.—A prolific species of Rye, from Oregon.

November 19th.—From the Botanic Gardens, Melbourne, 84 plants.

November 30th.—From Mr. J. Latham, Hobart Town.—19 plants.

December .—From the Royal Gardens, Kew.—Seeds of Cedrus Deodar.

December .—From — Lidbetter, Esq., India.—Seeds of Pinus Gerardiana.

LIST OF PLANTS SENT FROM THE ROYAL SOCIETY'S GARDENS DURING THE YEAR 1875.

January 2nd.—To Messrs. Hugh Low and Co., Nurserymen, Clapton, London—One Case containing 8 Tree Ferns.

February 13th.—To Mons. J. Linden, Ghent, Belgium—19 Tree Ferns.

February 13th.—To the Royal Gardens, Kew, near London—One Case containing sods of Abrotanella Forsteri.

March 2nd.—To the Department Agriculture, Washington, United States—12 packets seeds, 3 Tree Ferns.

May 17th.—To Mons. J. Verschaffett, Ghent, Belgium—12 Tree Ferns.

May 31.—To Mr. C. F. Creswell, Seedsman, Melbourne—One packet seeds.

May 31st.—To Mr. E. B. Heyne, Seedsman, Adelaide—One packet seeds.

May 31st.—To the Department Agriculture, Washington, United States America—One package seeds.

May 31st.—To the Royal Gardens, Kew, near London—One package seeds.

May 31st.—To Mr. Wm. Bull, New Plant Merchant, London—One package seeds.

May 31st.—To the Acclimatisation Society, Queensland—Package seeds.

May 31st.—To the Dobroyd Nursery, Ashfield, near Sydney—Package seeds.

May 31st.—To Mr. C. Hollinsdale, Seedsman, Hobart Town—Package seeds.

May 31st.—To Mr. J. Latham, Seedsman, Hobart Town—Package seeds.

May 31st.—To Colonel Crawford—5 packets seeds.
June 28th.—To Mr. G. Brunning, Nurseryman, Melbourne—One case plants.
June 28th.—To the Royal Gardens, Kew—Telopea seeds.
June 28th.—To Mr. Wm. Bull, London—Telopea seeds.
July 6th.—To Jules Cock et Sœur, France—Package seeds.
July 6th.—To Messrs. Vilmorin and Andrieux, Paris—One package seeds.
July 6th.—To Mardy et Cie, France—Package seeds.
July 13th.—To the Botanic Gardens, Queensland—Box of plants.
July 27th.—To Messrs. Shepherd and Co., Nurserymen, Sydney—Box seeds.
July 27th.—To the North China Branch Royal Asiatic Society—Package seeds.
August 9th.—To the Botanic Gardens, Christchurch, New Zealand—Case of plants.
August 9th.—To the Dobroyd Nursery, Sydney—Case of plants.
August 27th.—To the Botanic Gardens, Adelaide, South Australia—Case of plants.
October 7th.—To Dr. Webster, for the New Zealand Government—Package seeds
October 31st.—Messrs. Vilmorin and Andrieux, Paris—Package seeds.
October 31st.—To F. Sandes and Co., London—Package seeds.
November 10th.—To the Japanese Commissioners—Package seeds.
November 16th.—To John Culyes, New York—Package Eucalyptus seeds
November 27th.—The Botanic Gardens, Adelaide—Case of plants.
November 29th.—To Messrs. Vilmorin and Andrieux—Package seeds.

PLANTS SUPPLIED FOR PUBLIC PLACES DURING 1875.

June 1st.—Brickfields Establishment—60 plants.
June 3rd.—Memorial Church—30 Plants.
June 30th.—Hobart Town Cemetery—198 plants.
June 30th.—Government House—20 plants.
July 27th.—Hobart Cemetery—72 plants.
August 30th.—High School—39 plants.

F. ABBOTT, Jun.,
Superintendent.

LIST OF PLANTS INTRODUCED INTO THE ROYAL SOCIETY'S GARDENS DURING THE YEAR 1875.

Abutilon Santana
,, vexillarium variegatum
Acer pseudo-platanus Canterburyana
Æthionema cordifolia
Allamanda Hendersoni
Albizzia odoratissima
Aloe ciliaris
Alonsoa linifolia
Amaryllis robusta
Andromeda axillaris
Androsace Coronopifolia
Anguloa Clewesii macrantha
Anthurium leuconeurum
,, magnificum
Aralia Guilfoylei
Artocarpus integrifolius
Asplenium Colensoi
,, flabelliforme
,, obtusatum minor
Aucuba longifolia
,, mascula
,, picta
,, salicifolia
,, viridis vera

Bambusa argentea stricta
Bauera sessilifolia
Berberis Leschenaulti
Boltonia asteroides
,, latigramia
Boronia crenulata
Borya nitida
Bougainvillea laterita
Brahea egregia
Bracteolaria racemosa
Brassia actinophylla
Butomus umbellatus
Buxus sempervirens argentea

Cacalia articulata
,, scandens
Caladium Newmanni
Canthium lucidam
Cattleya amethystiglossa
,, bicolor
,, Crispa
,, intermedia
,, maxima
,, Mossiae
Cattleya Skinneri
Cerasus Mollis
Cephalanthus occidentalis
Cerexylon ferrugineum
Certodeira chontolensis
Chamœdorea amazonica
,, elegantissima
,, glaucifolia
,, graminifolia
,, Lindeniana
Cheiranthus scoparius
Cinnamomum verum
Cissus Lindeniana
Citrus decumana
Clematis afoliata
Clesyocalon australis
Clethra alnifolia
Cocos Bonnetti
,, Comosa
,, coronata
,, procopeana
Cordyline albicans
,, Hendersoni
,, Hookeri
,, limbata
,, metallica
Coronostylis grandiflora
Croton ovalifolium
,, Wrightii
,, volutum
Cryptomeria araucaroides
Cupressus funebris aureus
Cypripedium caudatum
,, Hookeri
,, insignis Maulei
,, superbum
,, venustum

Daubentonia grandiflora
Datisca superbissima
Dendrobium aggregatum
,, formossum gigante
,, macrophyllum
,, Parishi
Deutzia crenata variegata
Dianthus alpinus
Dieffenbachia gigantea
Doodia connexa
Doryanthes Palmeri
Dyxia rariflora

Eranthemum sanguinolentum
Erica vilmoreana brevifolia
,, ,, grandiflora
,, ,, minor
Esculus hippocastanum Stevensii
Eugenia jambosa
Euphorbia Jaquini
Euphoria Longana

Ficus aspera
,, Cooperi
Fittonia argyroneura
Francoa decora
Funkia Sieboldtii variegata

Garcanum Lindenianum
Gardenia Fortunii
Genetylis tulipifera
Geonoma Spixiana
Gesneria exoniensis
,, refulgens
Gongora alba purpurea
Grevillea alpina aurea
Griffinia hyacinthina
Gymnogramma Muelleri
Gymnostachya gigantea

Hakea eriantha
,, gramatophylla
Hemiptera myrtifolia
Hespericordium lacteum
Hibiscus Cooperi
,, Coxi
,, grandiflorus
,, liliflorus
Hippeastrum Hendersoni
,, majestica
,, pearl
,, startling
,, vulcan
Hydrangea japonica Eugenie
,, Otaksa
Hypericum florabundum

Ilex aquifolium Armstrongii
Ilex nobilis
Iris acuta
,, setosa
Ixora coccinea

Juniperus rigida aurea
,, Virginiana aurea

Knightia excelsa

Lælia anceps
,, cinnabarina
,, furfuracea
,, superbiens
,, Perrini
Lagerstrœmia parviflora
Lambertia formosa
Leidenbergia rosea
Libonia Penrhosiensis
Ligustrum ovalifolium variegatum
Lobelia subnuda
Lychnis dioica

Mackaya bella
Magnolia fuscata
,, obovata
Malortica gracilis
Mangifera indica
Maranta Lindeni
,, Porteana
,, regalis
Melaleuca nosophylla
Melia japonica
Metrosideros robusta
Miltonia Morelliana
,, spectabilis
Musa ensete
Muscari moschatum flavum
Myristica moschata
Myrsine chatamica
,, variabilis
Myrtus macroyhylla fl. pl.

Nauclea cordifolia
,, parviflora
Nephelium tomentosum
,, Litchi
Nephrodium hispidum
Nothospartium Carmichœloides

Odontoglossum Bictonensis alba
,, Cerventesii
,, Citrosum
,, Cristatum
,, Ehrenbergii
,, læve
,, nebulosum
Oncidium aurosum
,, altissimum
,, barbatum grandiflora
,, Crispum grandiflorum
,, cuculatum flavidum

Onicidium kramerianum
,, nubigenum
,, ornithorynchum
Ophiopogon jaburum

Pandanus veitchii
Paspalum elegans
Peperomia verschaffeltii
Phœnix farinifera
Phædronassa gloriosa
Phajus grandiflorus
,, maculatus
,, Wallichi
Psycotria lomoceroides
Picea amabilis
,, aurea variegata
,, firma
Pinus Fremontiana
,, flexilis
,, Hamiltoni
,, orientalis
,, Pindrow
Piper Cubeba
,, javanicum
,, nigrum
Platanus occidentalis
Pleroma sarmentosa
Plumbago splendens
Polygonum silenioides
Polypodium pennigerum minor
Populus macrophylla
Prostanthera violacea
Psidium aromaticum
,, littorale
,, pomiferum
Pteris comans
,, hastata
,, pedata
,, serrulata cristata
Ptychosperma Alexandria
Punica alba plæno
Pyrethrum corymbosum
Pyrus aria

Quercus Lucumbiana
,, Lonomensis

Ranunculus fumariœ folius
Rhamnus alaternus variegatus
Rhus radicans
,, tomentosa
Rubus fruticosa flora plœno

Sabal dealbata
Sabal Moccini
Salvia gigantea
Sanchezia nobilis variegata
Schomburgkia tibicinus
Scolopendrium vulgare
Setaria nubica
Sisyrinchium grandiflorum
Sobralia macrantha
Solanum capsi-castrum gigantem
Spiræa syringæfolia
Stanhopea Bucephalus
Stipa splendens
Syncarpia alvens
Syringa persica purpurea

Terrietia argyrodendron
Taxus baccata aurea variegata
Teucrium asiaticum
,, Botrys
Tricopilia coccinea
,, suavis
,, sanguinolenta
Thrinax elegans
,, mauritæ formis
Triconema grandiflora
Tilia platyphylla
,, pendula
Tylaphora barbata

Ulmus Montana variegata

Vanilla aromatica
Veronica Schmidti
,, speciosa vera
Vessicaria splendens

Wigandia chilensis
,, Vigieri

Zamia cylindrica
Zygopetalum Mackayi

RHODODENDRON.

Countess Haddington
Jesminæflorum
Veitchi

CAMELLIA.

Compt de Paris
Countesse Celini
Lapace
Jenny Lind
Moli Mc Tanque

BEGONIA (Tuberous).

Anacreon
Corsair
Ensign
Gem
Lothair
Mazeppa
Seraph
Sir Hercules Robinson
Sedeni magnifica
Surprise
Tarquin

COLEUS.

Beauty of Adelaide
Empress
Golden Gem
Prince Bismarck
Sedan

ROSE.

Abbe Bramerel
Alba rosea
Bessie Johnson
Baronne Louise Uxkull
,, Moirmont
Duke of Edinburgh
Edward Morren
General Drouet
Gloire des Mosseus
Lamarque
Mrs. Veitch
Madame Eugene Appert
,, Berarde
Mademoiselle M. Rady
,, Annie Wood
,, Berthe Leveque
Madeline Nonin
Marquiss de Ligneris
Nardy Freres
Peach Blossom
Prince Leopold
Senateur Vaisse
,, Favre
Semiramis
Thorin

PELARGONIUM.

Aline Sisley
Countessa of Craven
Fair Emily
Humming Bird
Lavinia
Louisa Smith
Mrs. Rutler
Mrs. Turner
Perilla
Queen Victoria
White Clipper

ORANGES AND LEMONS.

Citron, Bengal
Lemon, Heong Leong
Shaddock, Blood
Orange, Blood
Siletta

FIGS.

Bulls, No. 1
Castle Kennedy
Fique d'Or
Large Black Genoa
White Genoa
White Marseilles
Smyrna

F. ABBOTT, Jun.

PRINTED AT THE MERCURY STEAM PRESS OFFICE, HOBART TOWN.

PAPERS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA,

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Errata.

Page 90*a*, line 11, 12, 13, 30, omit second do., genera only are meant, not species.
Page 90*b*, line 12, 25, to 28, 35, 52 „ „ „
Page 90*c*, line 8, 12, 13, 35 to 39, 42, 3 „ „ „
Page 90*d*, 39, 50, 55, to 57, 60 „ „ „
Page 90*e*, 19, 37, 38, 42. „ „ „
Page 90*d*, line 15 from bottom, after " ditto " insert " Tenisoni."
Page 90*e*, between 25 and 24 insert " Venus aphrodinoides."
Page 90*f*, line 4 from top insert " *c* in col. 18."
„ Between 6 and 7 insert " Micraster Etheridgei," and *b* in col. 1, line 12 insert " *c* " in cols. 1 and 22, line 14, insert " *c* " in col. 22.
Page 90*b*, line 33 from top for "octopticata" read " octoplicata."

The responsibility of the statements and opinions given in the following papers and discussions rests with the individual authors, the Society as a body merely places them on record.

Contents.

ROYAL SOCIETY, 1876.

MARCH, 1876.

The first evening meeting of the session was held on Tuesday, the 14th March, T. Stephens, Esq., M.A., F.G.S., in the chair.

The Hon. Secretary (Dr. Agnew) brought under notice the following returns, viz. :—

1. Visitors to Museum during February, 1471.
2. Visitors to Gardens during February, 4591.
3. Plants and seeds received at Botanic Gardens during February.
4. Time of leafing, flowering, and fruiting of a few standard plants in Botanic Gardens during February.
5. Books and periodicals received.
6. Presentations to Museum.

Meteorological Returns.—

1. Hobart Town, from F. Abbott, Esq.—Table for February.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Port Arthur, from J. Coverdale, Esq., M.D.—Ditto for January and February.
4. Mount Nelson, from Marine Board—Ditto, ditto.
5. Sydney, from the Government Observer—Printed Tables for October and November, 1875.

The presentations to the Museum were as follows :—

1. From Dr. G. Bennett, F.L.S., F.Z.S., Sydney—Specimen of Ammonite from Western Australia. 2. Portions of Humerus, and two of lower jaw of Diprotodon from Darling Downs, Queensland.
2. From Dr. Coverdale, Port Arthur—A large hair ball, from the stomach of a calf six weeks old.
3. From Mr. Piguenit—Sample of the paper-like bark of a species of tea-tree.
4. From Mr. Lukin Boyes—A bivalve shell (*Spondylus*), locality unknown.
5. From Mr. J. Baker—Two samples of tin ore from New South Wales.
6. From Mr. J. B. Mather—Popular reprints of ten early English Newspapers, viz., *The English Mercurie*, 23rd July, 1588 ; *The Weekly Newes*, 31st January, 1606 ; *The Gazette*, 5th September, 1658 ; *The Newes*, 6th July, 1665 ; *The London Gazette*, 10th September, 1666 ; *The Times*, 3rd October, 1798, 16th April, 1801, 7th November, 1805, 10th January, 1806, and 22nd June, 1815.

The Rev. W. W. Spicer remarked that the earliest of these, the *English Mercurie*, had been proved to be a forgery ; the others, however, were genuine and of great interest.

7. From Mr. Ludbey, Brighton—Two specimens of Fossil Wood.
8. From Mr. Tasman Morrisby—A White Hawk (*Leucospiza novæ hollandiæ*).
9. From J. C. Barclay, Esq.—Specimens of the Copper Coinage in circulation in Tasmania in 1875, at the period of the cessation of the copper currency (50 pieces). Specimens of the Bronze Coinage in circulation in Tasmania in 1875 at the time of the withdrawal of the copper coinage (28 pieces).

10. From the Hon. J. Maclanachan, Esq.—An Egyptian Goose *(Chenalopex ægyptiaca)*.
11. From the Rev. J. Ross—A large prepared specimen of the Monitor Lizard of Australia.
12. From Mr. Blyth, Honeywood — Two Black Snakes. *(Hoplocephalus curtus.)* A peculiar Insect from the bark of a stringy-bark tree.
13. From Mr. S. Baynton—Specimen of Silicified Wood, from Brown's River Beach.
14. From Mr. Brunt — Fossils from Travertine beds, Geilston Bay. Fossiliferous limestone from Bridgewater.
15. From Mr. Jeffrey—Fossiliferous limestone, from near New Norfolk.
16. From Mr. T. Williams—Specimen of the Pacific Heron *(Ardea pacifica)*, shot at Lake Tiberias.

The SECRETARY observed that this specimen was of interest, as it afforded the first known indication of the presence of the *Ardea pacifica* in Tasmania. As to its habitat, Gould in his description of the bird only states it is "a summer visitor to the whole of the Southern Coast of Australia."

17. From Mr. J. E. Risby—A large Crab found on beach at Pirate's Bay, Tasman's Peninsula.
18. From Captain Audley Coote — Specimens of the New Zealand Telegraph Cable, shewing shore-end, intermediate, and deep-sea portions, neatly mounted in plate glass case.
19. From Major Dumbleton—Two casts of Fossils from the Mersey.
20. From F. A. Blackman, Esq.—Samples of two qualities of sugar, from the plantation *(Antigua)* of A. H. Brown, Esq., Mary River, Queensland.

In reference to presentation No. 18, the following extract from a letter from Captain Nares of H.M.S. Challenger to the donor was read :—" On the Australian coast the incline from the 100 fathoms line, which was 17 miles from Sydney, into a depth of 2,100 fathoms at 57 miles distance, was about 1 in 20, which is less abrupt than we had previously found to be the case further to the southward of Twofold Bay, where it was about 1 in 6. The bottom, which consists of *soft ooze*, then slopes down to a depth of 2,600 fathoms at a distance of 240 miles from the coast of Australia, the temperature being 33°, which conditions continue for 140 miles. From this extreme depth the bottom slopes with a gentle incline, with soft ooze, for 400 miles, until, at a position 780 miles from Sydney, and 335 miles from the entrance to Cook's Straits, we obtained soundings in 1,100 fathoms. Between this and New Zealand only shallow soundings below 400 fathoms, with hard bottom, were obtained. The bottom on this part was extremely hard, so much so that we obtained little or no samples in the sounding rods, but as both the trawl and dredge dragged freely along, without catching in any irregularities, it must have been of a smooth nature."

In reply to a remark as to the very low temperature at the deep soundings, mentioned by Captain Nares, the SECRETARY observed it certainly at first sight seemed extraordinary that about the latitude of Sydney, the deep water of the Pacific should have a temperature only one degree above the freezing point. This, however, was quite in accordance with Dr. Carpenter's theory of vertical oceanic circulation. Stated briefly this theory was to the effect that the polar cold primarily, and the equatorial heat secondarily establish a vertical circulation by which the icy polar water flows along the bottom towards the equator, whilst the warm and lighter surface water of the tropical seas flows in the opposite direction. This theory therefore pointed to an almost polar cold at the greatest ocean depths irrespective of latitude.

Mr. STEPHENS drew attention to a specimen of fossil wood (presentation No. 13), received from Mr. Baynton, exhibiting in section a good example of the concentrically ribboned crystal locally known as carnelian, and throwing some light upon its origin. Other evidence, which was mentioned, also tended to connect these crystallised forms with silicified wood so abundant in many parts of Tasmania, but the subject required investigation. Mr. Stephens also exhibited a specimen of fossil wood from the interior of a mass of the Penguin Creek conglomerate breccia, which he had picked up on the road-side while travelling on the North Coast. This was interesting as being the first and only evidence of organic remains in any of the conglomerates of the North Coast, none of which probably were more recent than Lower Cainozoic, and some of which were certainly as old as Lower Silurian.

The following communication—" An attempted solution of the roaring of the Western Mountains," by the Rev. E. P. Adams—was read :—" At certain times there is to be heard in the nighbourhood of the Western Mountains a roaring, loud, awful, and continuous. It is not restricted to any particular time of year. I believe I have heard it all seasons. The area where it is audible lies from Bishopsbourne to Deloraine and Chudleigh, and I daresay further on in either direction—so that I estimate the area for the sound, as below forty miles at a moderate computation. Various opinions are expressed as to the cause of this noise. 1. The agitated waters of the Great Lake, distant about 20 miles. 2. The roaring of the sea thirty or forty miles off. 3. The Meander Falls, about sixteen miles away and about five hundred feet in height. But without trying to demolish these theories, I shall submit that which I believe to be the true cause of the sound. And first I shall describe the noise as last heard on Thursday, the 10th ultimo (January). Thursday night was calm and cold, after a gale of wind all day, which had succeeded a week of very hot weather, ending with thunder and lightning. These would demonstrate a disturbed state of the atmosphere. About 10 p.m. the rumbling in the mountains was very grand and distinct. My companion when I called her attention to it, as we walked in the moonlight, said 'Is it not terrible.' It sounded as if a Lake had burst its banks, and the waters were roaring and raging towards us, *i.e.* Deloraine. Taking into consideration that this sound is always to be heard after a disturbance in the atmosphere, and when the air on the plains is still, and I suppose cooling, the sound appears to me to be accounted for on this principle :—When the air of a hall or passage seeks an entrance through the key-hole in the door of a warm room, the humming noise of the cold air passing through the key-hole is often startling. The air being disturbed, and the mountain air suddenly cooled, it rushes through the mountain gorges to the warmer plains—these gorges form a passage for the cold air like the key-hole of the warm room, and the cataract of cold air keeps up the sound until the air beneath has become cooled to the level of the mountain air."

Mr. P. T. Smith stated he had frequently heard this peculiar roaring sound at Syndal (Ross district), but had never heard of any attempt at explanation.

The Rev. W. W. Spicer asked if any one had ever been on the mountains when the noise was present?

Mr. Stephens thought not. He was, however, quite familiar with the sound, which was heard occasionally both on the eastern and western side of the tiers, and therefore extended over a considerable tract of country. He did not think we had sufficient data at present on which to found any quite satisfactory explanation.

The Secretary remarked it was frequently a most difficult matter to obtain satisfactory data for the explanation of such phenomena. Apropos to the present case he instanced the occurrence at the Delta of the Ganges, of those peculiar sounds locally known as "The Guns of Burrisaul," the cause of which has not yet been determined. A short account of these sounds, from "All the Year Round," for July, 1875, was then read.

An instance of the extremely high temperature experienced in some silver mines in the Nevada territory having been communicated to the Society by Captain A. Coote as its last meeting, the following explanation by Professor Rogers was read from an American paper. "Among the chemists an interesting account was given by Professor Rogers of the chemical processes going on in the depths of the silver mines, in the Nevada Comstock lode. In the deeper drifts of the mines the heat is almost intolerable, the temperature being frequently as high as 150 degrees. Life is supported only by pouring ice-water on the head. The water that trickles from the rocky roof of these drifts is so hot as to be almost scalding, and the workmen are protected from it by sheet-iron screens. The temperature is far beyond what would be due from the depth of the mine, and is largely owing to the presence and decomposition of sulphides. There is a trace of saline matter, and the contact of the sulphide of silver with chloride of sodium produces, by chemical action, the high temperature. Professor Rogers' explanation of the cause of the great Californian Steam Geysers will be a great blow to all wonder-loving tourists. 'The geysers,' he says, 'exhibit no great geological phenomenon, but result solely from the action of superficial chemistry. The heat is caused by the action of air and water upon iron pyrites, generating oxide of iron and sulphuric acid, which readily form sulphate of iron.' This will be a disappointment to those who imagined fiery furnaces and boiling cauldrons sending up the startling steam jets, and scalding waters."

Some extracts were read by the CHAIRMAN from a paper by Mr. E. T. Newton, F.G.S., on the result of a microscopical examination of "Tasmanite," the so-called "Dysodile" of the Mersey. Mr. Newton says, "The two substances known as 'Tasmanite' and 'Australian White Coal,' which are the subject of the present communication, have a special interest for the geologist on account of the light which they throw upon the microscopic structure and composition of many coals. My attention was first directed to them when collecting materials for Professor Huxley's examination into the microscopic structure of coal. My esteemed colleague, Mr. Etheridge, at that time gave me a specimen of brown laminated substance, labelled 'Lignite, the so-called White Coal, Australia,' and drew my attention to the fact that it was very largely composed of small seed-like bodies, very similar to, although smaller than, the macrospores of *Flemingites*, which are seen in many kinds of British Coal. A specimen of this same kind of White Coal is in the Museum of Practical Geology, and is labelled 'Bituminous Shale (locally called White Coal), New South Wales, Australia.' I have likewise been able to examine the specimen of Tasmanite also in this Museum, which is labelled 'Tasmanite; combustible matter from the River Mersey, on the north side of Tasmania; stratum of unknown thickness, but known to extend for some miles. Presented by Sir William Denison.'" The author's conclusion is, that "There can be no question as to the Tasmanite sacs being vegetable organs, although at present we do not know the plant to which they belong. Their size and form seem to indicate that they are more nearly allied to Lycopodiaceous macrospores than to anything else. The inconvenience of having an object without a distinctive name induces me to propose one for the spores (?) found in Tasmanite and Australian White Coal (the two being, as I believe, identical in structure); and in order to retain existing titles as far as possible I would suggest that Professor Church's name *Tasmanite*, which is so generally used in reference to the schist as a whole, be retained for this substance, and that the spores (or rather the plant to which they belong) should be called *Tasmanites*, with the specific title of *punctatus* in allusion to the surface markings."

None of the Fellows present were acquainted with the substance referred to as "Australian White Coal," but the Rev. W. W. Spicer thought the term was used by Strzelecki.

Mr. Stephens remarked that Mr. R. M. Johnston of Launceston had given much time and attention to the examination of these discs, or rather sacs, in the Mersey schist, though his description differed slightly from that of Mr. Newton. He was clearly the first person in Tasmania who had identified them as the spores of a Lycopodium or some allied plant. Tasmanite belongs to the Mersey Coal formation, and is associated with Marine fossils of Devonian type.

The Secretary informed the meeting that His Excellency had intended opening the session by an inaugural address. Absence from town had prevented this, but His Excellency proposed making the address at the next monthly meeting. It was also mentioned that a paper by Mr. R. M. Johnston on the Tertiary Marine Deposits of Tasmania had been received in time for the present meeting. This, however, could only be read by the Rev. J. E. Tenison Woods, as he was prepared to illustrate and explain it by reference to a collection of fossils which accompanied the paper, and with which he was familiar. As Mr. Woods was absent on duty, the reading of this paper had to be postponed until his return to town, which was expected to take place before the April meeting.

A vote of thanks to the donors of presentations closed the proceedings.

APRIL, 1876.

The monthly evening meeting of the Society was held on Tuesday, 11th April, His Excellency F. A. Weld, Esq., C.M.G. in the chair.

The following were among the Fellows present; viz.:—Sir Francis Smith, Chief Justice; His Honor Mr. Justice Dobson, Sir J. M. Wilson, Rev. W. W. Spicer, Messrs. H. Weld-Blundell, E. S. Hall, J. K. Lewis, H. Bilton, Justin McC. Browne, J. Barnard, M. Seal, H. J. Buckland, A. G. Webster, W. V. Morris, F. Abbott, jun., H. Scott, J. M. Clarke, C. H. Grant, C. Dowdell, F. T. Salier, H. J. Lucas, J. Swan, M. Allport, and Dr. Agnew, hon. sec.

The Secretary brought under notice the following returns for past month:

1. Number of Visitors to Museum, 1,300.
2. Ditto to Gardens, 4,053.
3. Seeds received at Gardens.
4. Time of leafing, flowering, and fruiting of a few standard plants in Botanic Gardens during the month.
5. Books and Periodicals received.
6. Presentations to Museum.

Meteorological Tables:—

1. Hobart Town, from F. Abbott, Esq.—Table and Summary for March.
2. Port Arthur, from Dr. Coverdale—Ditto.
3. Mount Nelson, from the Marine Board—Ditto.
4. Goose Island, from ditto—Ditto Feb.
5. New Norfolk, from W. E. Shoobridge, Esq.—Ditto March.

The Presentations to the Museum were as follows:—

1. From Mr. J. S. Scholes.—A collection of coins (34 copper and 2 silver). Specimen of "Chrome," from New Zealand. Egg-shaped boulder of "Blue Stone" from the Werribbee Creek, Sunbury, Victoria.
2. From J. K. Lewis, Esq.—A fine specimen of the Caspian Tern *(Sylochelidon caspia)*, shot at Frederick Henry Bay, Feb., 1876.
3. From Mr. J. Bonney.—Part of skeleton of a Turtle, from Queensland.
4. From Mr. Gillon.—A specimen of opal from Cornelian Bay Cemetery.
5. From Mr. Harrison Cades, Brown's River.—A specimen of the Owlet Nightjar *(Ægotheles novæ hollandiæ)*. Sp. 38, Gould's Handbook of Australian Birds.
6. From Mr. G. Rice.—A Freshwater Crayfish *(Astacus* sp.) from McRobie's Gully.
7. From A. Simson, Esq.—Specimen of *Antechinus swainsonii.* Two Native Rats *(Mus fuscipes ?* and *Mus sp.)*
8. From Mr. Young.—A living specimen of the so-called "Sea Hare" *(Aplysia tasmanica.* Tennison Woods).
9. From H. M. Hull, Esq.—Skull of Native Tiger *(Thylacinus cynocephalus).*
10. From Mr. W. E. Hall.—Specimen of the long-eared Bat of the Colony *(Nyctophilus unicolor).*

Presentations to Library:—

1. From Rev. W. W. Spicer, M.A.—Copy of "A Handy Book to the Collection of Algæ, Diatoms, Fungi, Mosses," etc. Translated from the German, and edited by the donor.
2. From Miss Fergusson, Tinderbox Bay.—A copy of the Bible, printed in the Irish language.
3. From the Trustees of the British Museum. Catalogue of Marine Polyzoa, part 3 *(Cyclostomata.)*
4. From Zoological Society, London.—Proceedings of the Society, 1874, part 4; 1875, parts, 1, 2, and 3. List of Vertebrate Animals in the Society's Gardens, suppt. 1872 to 1874.

5. From Geological Society, London.—Quarterly Journal of Society, Vol. 30, Nos. 119 and 120 ; Vol. 31, Nos. 121 to 124. List of Society, Nov. 1875.
6. From Royal Geographical Society.—Journal of Society, Vol. 14 (1874). Bd. Proceedings of ditto, Vol. 19, Nos. 1 to 7 (1875).
7. From Royal Asiatic Society.—Journal of Society, Vol. 7, part 2 ; and report for 1875.
8. From Linnean Society.—Journal of Society, Vol. 14, Nos. 78 to 80, *Botany* ; Vol. 12, No. 59, *Zoology*.
9. From the Hon. the Colonial Secretary.—A copy of the Geological Map of Australia and Tasmania, published by the Government of Victoria, mounted and varnished.

In the absence of the author a paper entitled "Notes on a new Genus of Nudibranchiata," by the Rev. J. E. Tenison Woods, was brought before the meeting by the Secretary. (In reference to its name "*Allportia*" the author remarks : "This new genus I propose to dedicate to Mr. Morton Allport, as a slight mark of appreciation of his great services to science and acclimatisation in Tasmania.")

Some introductory remarks on "Contributions to the Phytography of Tasmania, Part 4," by Baron von Mueller ; also, an introduction to "Notes on a new species of *Vaccinium* from Samoa," by the same author, were read.

The Secretary then read a communication from Mr. Calder on the language of the Aborigines of Tasmania, having previously remarked that, although Mr. Calder unfortunately was not a member, the paper was one which he was sure would be of interest to the meeting. The paper gave a list of ninety-six native words published in the *Courier* of the 3rd November, 1828, and referred to another published by Dr. Milligan in the Society's proceedings (Vol. 3, p. 239) containing 882 words. In addition to these, however, a third list of 2000 native words compiled by Mr. George Augustus Robinson (the principal captor of the native tribes) was mentioned. This important list had disappeared, and it was suggested that inquiry should be made concerning it. The author also thought that many other native words might still be rescued from oblivion, and instanced several persons from whom information on the subject might be obtained.

After reading the paper the Secretary remarked he then held in hand a third list of 332 words, and 72 names of men and women, of the existence of which Mr. Calder was evidently not aware. It was compiled by the late Rev. J. Norman of Sorell, and was very carefully made out, every word being properly accentuated, and was also interspersed with remarks on the manners and customs of the Aborigines. It was intended to print a compilation of all our known aboriginal words, and a copy would certainly be forwarded to the great philologist of the day—Max Müller.

His Excellency thought this was a matter well worthy of the attention of the Society. The Government of New Zealand considered the preservation of the native language so important that a grant of public money had been given for the purpose when he was Premier ; and again when Governor of Western Australia, money had been granted by that Government for a similar purpose.

His Excellency delivered an inaugural address.

Conversational discussion ensued on several points referred to in the President's very valuable and suggestive address. In reference to the suggestion as to certain works which might be advantageously carried out in the Public Gardens, the Secretary remarked that nothing but want of funds prevented them from being undertaken. For the work of the gardens only three men were available, together with a gang supplied by Government, which, however, was steadily becoming so small and inefficient as to be almost worthless. The wages paid to the men were only at the rate of four shillings per day, and in consequence a petition from them for an increase had recently been received by the Council and forwarded to the proper quarter for the consideration of the Governor-in-Council. To afford a fair increase of pay, and procure a small increase of labour, in view of the probable collapse of that supplied by Government, an annual grant of £700 was the very lowest at which the Gardens could be worked. Formerly the gardens had far more than the present grant when they were only one-half the size they now are, and when only a tithe of the present number of plants were in cultivation. A grant of £700 per annum would only give one man to every four acres, whereas a man to an acre was the proper proportion in Botanical Gardens. The Gardens in Melbourne, certainly twice the size of ours, were worked at a cost of six thousand five hundred pounds annually, whilst ours had only a grant of £400 annually, with the small extra supply of inefficient labour already mentioned.

General conversation took place as to the destruction of the Fern Trees on Mount Wellington, referred to in the Presidential Address. It was admitted that the destruction of these beautiful ornaments of the mountain gorges was carried on in the most wanton and barbarous manner. To afford a display for a single evening, instead of only taking the fronds, entire trunks, the growth of many years, were ruthlessly cut down, and thus by degrees whole valleys had been robbed of their beauty, and turned into unsightly wastes. A great public injury was in fact being done, as the mountain was fast losing one of its greatest attractions. At the same time so much of the ground has passed into private hands, it was difficult, if not impossible for any legislation to check the evil, though it was perhaps possible to abate it to some extent by having public taste and feeling aroused in opposition to it. It was finally resolved that a communication should be addressed to the Corporation pointing out the mischief which was being done, and suggesting that measures might be taken for preventing further destruction in localities over which the City Council exercised any right.

His Excellency remarked that the Minister of Lands and Works was most anxious for the preservation of all the natural beauties of the mountain, and, he was certain, would be glad to do everything in his power to assist in the matter.

Mr. Abbott informed the meeting that the Cork Oaks, mentioned in the address, had arrived safely at the Gardens. A considerable number of Himalayan Rhododendrons, from the Royal Gardens, Kew, had also been received at the same time in excellent order.

Mr. Justice Dobson read an interesting paper on the "Codlin Moth"—*Carpocapsa pomonella.*

The usual vote of thanks having been accorded to the donors of presentations, and authors of contributions, Sir J. M. Wilson proposed a special vote to the President, for his interesting and very suggestive inaugural address.

Mr. M. Allport seconded the vote, and referred particularly to that portion of His Excellency's address which related to the value of accurate observations on the habits of our various indigenous animals, now rapidly becoming extinct. Mr. Allport remarked that an additional reason for such observations was to be found in the fact that our fauna in a great measure consisted of forms which have passed away in Europe, and, therefore, the minute history of such fauna would, when compared with geological discoveries, throw great light on the condition of European countries during the tertiary period.

The vote having been carried by acclamation, was duly acknowledged by His Excellency, when the proceedings terminated.

MAY, 1876,

The monthly evening meeting was held on Tuesday, the 9th May, His Excellency the Governor, President, in the chair.

The following gentlemen, who had previously been nominated by the Council, were balloted for and declared duly elected as Fellows of the Society, viz. :—Right Revd. Bishop Murphy, the Rev. J. H. Brooke Bailey; Messrs. George Gilmore, T. M. Evans, Richard W. Lord, and Dr. E. L. Crowther.

The Secretary laid on table the following returns for the month of April :

1. Visitors to Museum, 1350.
2. Ditto to Gardens, 3907.
3. Plants and seeds received at and sent from Gardens.
4. Time of leafing, flowering, and fruiting of a few standard plants in Botanic Gardens during April.
5. Books and Periodicals received.
6. Presentations to Museum and Library.

Meteorological Returns.—

1. Hobart Town, from F. Abbott, Esq., Table for April.
2. Port Arthur, from J. Coverdale, Esq., M.D., Ditto.
3. New Norfolk, from W. E. Shoobridge, Esq., Ditto.
4. From the Marine Board, Table from Mount Nelson, April ; Bruni Island, ditto, February and March ; Goose Island, ditto, for March.
5. Sydney, from Government Observatory, printed tables for December, 1875.
6. New Zealand, from Dr. J. Hector, Printed tables, 1874.

The Presentations to the Museum were as follows :—

1. From E. L. Crowther, Esq., M.D.—A large collection of specimens of Tin Ore from lode, stream tin, &c., from various claims, Gould's Country.
2. From Mr. J. J. Martin—Spherical boulder of limestone *(Septarium)* 13 inches in diameter, from Moeraki Beach, New Zealand.—A portion of the stem of a Tree Fern, prepared for picture frame making.
3. From Mr. W. F. Hardy, St. Mary's—Specimens of eggs of Leech.
4. From Mr. A. Jackson, Hamilton—An albino variety of the Wattle Bird *(Authochæra inauris)*.
5. From Mr. R. Lord—Singular growth, resembling an oat, on an ear of wheat.
6. From Dr. Valentine, Campbell Town—A specimen of the Pouched Lamprey *(Geotria allporti)*, from the South Esk.
7. From Mrs. Meredith—A valuable, named and classified, collection of Algæ from Orford, Prosser's Bay, Tasmania. Collected and mounted by the donor.
8. From Maurice Weston, Esq.—Skeleton of Australian Crane *(Grus australasianus)*.
9. From Mr. W. F. Petterd—18 specimens of Land Shells from Yule Island, New Guinea.

[The Secretary mentioned that the donor of these specimens was the writer of those interesting letters on New Guinea which have recently appeared in the local press.]

10. From Mr. W. L. Boyes—Two immense Earth Worms from Gould's Country. (These worms, although much shrunken by immersion in spirits, measure about fourteen inches in length with a diameter of fully three-quarters of an inch). Two freshwater Crayfish from same locality.
11. From Mr. J. W. Graves—A Water Crake *(Porzana tabuensis)*.
12. From Mr. T. Stephens—Specimens of Wood and Foliage of *Athrotaxis selaginoides* and *A. cupressiformis*.

[In reference to this presentation, Mr. STEPHENS observed that there had hitherto been some doubt as to the species of *Athrotaxis* which furnished the timber known on the North Coast under the name of "pencil cedar," as distinguished from other "red pine," but it now appeared tolerably certain that it was obtained from *A. cupressiformis*, the smaller of the two trees. The logs from which these specimens were cut were from the neighbourhood of Middlesex Plains, and both trees are sparingly distributed in other parts of the North at an elevation of from 1,000 to 3,000 feet. Mr. Ronald Gunn had kindly furnished specimens of the foliage of both species. The red pine of Port Davey had been shown by Mr. J. R. Scott to be *Athrotaxis selaginoides*.]

13. From the Rev. J. E. Tenison Woods, F.L.S.—Specimens of Crabs from Bruni Island.
14. From R. C. Gunn, Esq., F.R.S., F.L.S.—An extensive Herbarium, principally Tasmanian.

[The meeting was informed by the SECRETARY that this great Herbanium, the result of forty years collecting by Mr. R. C. Gunn, was presented to the Museum by the owner with the sole proviso that duplicates should be returned to him. The labour of arranging, re-papering, and classifying such a vast collection would be enormous; but the Rev. W. W. Spicer and Mr. J. R. Scott had kindly undertaken it, and were engaged daily on the task. When this was finished, the presentation, in its perfect state, would again be brought under the notice of the Fellows. Mr. Grant, in the most liberal manner, had brought the several large cases containing the collection, free of cost, from Launceston by the railway. (Applause.)]

His EXCELLENCY remarked that the collection of Algæ (presentation No. 7) by Mrs. Meredith was an exact illustration of a subject he had referred to in his inaugural address, to wit the aid which may be rendered to science by careful collectors. Mrs. Meredith had lately informed him that she had no special knowledge of Algæ, and yet the first scientist in this branch in Europe acknowledges the great obligations he is under to her for new specimens.

The presentations to the Library were as follows:—

1. From the Surgeon General, United States Army, "Report of Cholera Epidemic of 1873, in United States."--1 Vol. 4to, pp. 1025.
2. From C. M. Maxwell, Esq.—First part of a work on the Australian Orchids, published for the Government of New South Wales.
3. From the Linnean Society of New South Wales—Proceedings of the Society, vol. I., part 1.
4. From Dr. Agnew—Publications of the Historical and Archæological Association of Ireland, 1874-5.
5. From Government of Victoria—"Index of Victorian Patents and Patentees" vol. 8.
6. From His Excellency the Governor—A copy of a work entitled "Natural History of Insects, Serpents, and Dragons." By John Johnston, M.D., Frankfort, 1652.

   Also a "Brief account of Bushman Folk-lore, and other texts," By W. H. J. Bleek, Ph.D. Presented to the House of Parliament, Cape of Good Hope.

HIS EXCELLENCY, the President, in reference to observations made by him in the inaugural address he had delivered at last meeting, desired to state that Mr. Abbott had been so good as to point out to him that he had been mistaken in supposing that the seeds of inferior varieties of Eucalypti were likely to be passed off on seedsmen or buyers as the seeds of the Blue Gum, *Eucalyptus globulus*. Mr. Abbott had thoroughly investigated the matter, and had convinced him he had spoken under a misapprehension. At the same time he had not spoken either without authority or without seemingly good grounds. It was only on that morning Sir James Wilson had authorised him to say that, without imputing blame to anybody, he had been so unfortunate as not to have obtained true blue gum seed when he was sending seed to Italy. Therefore it was not, perhaps, to be regretted that the attention of dealers and the public had been called to the matter. It had, however, been made plain, as Mr. Abbott would show, that mistakes could not easily arise in the seed of Tasmanian species; and he hoped that the press would give the same publicity that they had given to his first statement, to the avowal he made that he was now convinced that seed obtained from respectable seedsmen might be relied upon as true to sort, and that he was mistaken in two instances he had adduced. It would appear that the young plants raised at Government House as an experiment must really be blue gum, though strangely altered by culture, soil, heat, or some other cause, not only in the colour but also in the shape of the leaf. He was happy to be able to make this statement, and Mr. Abbott deserved great credit for the trouble he has taken in the matter. It had been further represented to him that he had been mistaken in believing that the destruction of timber and ferns on the sides of Mount Wellington was unauthorised; but that was not the point at all that he had raised; he did not stop to enquire whether the waste and destruction were authorised or not, or even whether some of it might not be on private property or not. Of course all rights should be respected, but any difficulty that might at present be incurred in dealing with private rights would be increased tenfold as years went by, whilst the injury already done was incalculable, and was going on from day to day. It was already the eleventh hour so far as saving the ferns and vegetation of the undergrowth; a great proportion of the larger trees was already gone. What he desired to do was to impress upon them the necessity of taking steps to secure for the people of this city, and for its visitors, a noble space for amusement, for the study of nature, and for health. He begged of those who had the power whilst there was yet time, to consider the interest not only of themselves but of their children and their children's children. He would ask them to look at the efforts which are being now made in England in this direction, and at the enormous sums that such efforts absorb; at the American nation, that, with a wise foresight whilst yet there is time, sets aside and reserves a tract of land the size of a county as a recreation ground and field for the study of nature for the American people. That some similar step should be taken here was the point to which he had endeavoured to attract attention, and if the public would interest themselves in the matter it rested with them to benefit not only themselves, but to confer an incalculable benefit on future generations of Tasmanians. He would now ask Mr. Abbott to read his paper.

Before Mr. Abbott proceeded to comply with the request of the President,

The SECRETARY begged to refer to a resolution passed at the previous meeting, to the effect that a communication should be addressed to the Corporation, pointing out the mischief that was being done by the destruction of the fern trees, etc., on Mount Wellington, and suggesting that steps should be taken for preventing such destruction in future in localities over which the City Council exercised any right. In accordance with this resolution, a letter had been addressed by him to the Mayor (letter read).

Mr. F. ABBOTT, jun., then read the following remarks:—

"Notes on *Eucalyptus globulus* (Blue Gum of Tasmania), compiled for the purpose of showing the improbability of spurious seed being supplied from Tasmania.

"Though I was present at the last meeting of this Society, and heard His Excellency's remarks in reference to the adulteration of blue gum seed, I was not then prepared to offer any explanation in the matter, as I did not at the moment know the circumstances that had led to the statement; but, believing that a mistake had arisen, I regarded it as a matter of duty to institute such enquiries as would remove any doubt existing on the subject.

"It is well known that the blue gum has of late been very extensively planted in various parts of the world. In Algeria and California it is planted by hundreds of thousands, and in the latter place companies have been formed for its extended cultivation. It therefore becomes a matter of some importance to cultivators to ascertain whether it is possible they have been supplied with spurious seed, and are cultivating the wrong plant or not.

"So far as seed obtained from Tasmania is concerned, I cannot believe that any but the true *Eucalyptus globulus* has been supplied. In the first place, the capsule and seed of this species is so distinct from any other known Tasmanian kind, that seedsmen or merchants once having seen them could not be imposed upon by the substitution of any other species; and, again, it is the only indigenous kind producing fertile seed sufficiently large to enable collectors to separate it from the abortive. As a rule, all the other Tasmanian species are sold as they shed from the capsule—that is, the fertile and abortive seed mixed together.

"His Excellency's remarks appear to have originated from the circumstance of his attention having been called to some fallen trees of Eucalyptus a short distance above the Springs on Mount Wellington, which were said to have been felled for the sake of their seed, together with the fact that the produce of some seed which he had purchased in Hobart Town as that of the *Eucalyptus globulus* did not appear to him to be the true blue gum.

"With reference to the particular patch of trees referred to, I have not the slightest doubt that they were felled for their seed, which was collected and exported under its proper name (*Eucalyptus urnigera*). There is, in fact, a limited demand for these alpine species of Eucalypti, which are required for cultivation in places that have proved too cold for the blue gum. I hold in my hand an order from a French house, Mons. Vilmorin, Andrieux et Cie., which enumerates no less than 64 species of Eucalypti of which they require seeds. Included in these 64 species are a few indigenous to Tasmania, three of which are alpine, viz., *Eucalyptus gunnii*, *Eucalyptus urnigera* and *Eucalyptus coccifera*. These forms are found on the mountains, and all are met with on Mount Wellington, from the Springs upwards. *Eucalyptus gunnii* is also common to the Lake district, where it has received the name of 'Cider tree.'

"Though previously aware that these three species had been collected on Mount Wellington by the Brothers Gulliver, I thought it advisable to write to Mr. B. Gulliver for full particulars. His answer I will give in his own words:—

"'In reply to your request it affords me much pleasure to furnish you with what particulars I can respecting the collection of Eucalyptus seeds. I have collected the following seeds on Mount Wellington, and have purchased the same three species from Mr. Woods, who lives there, namely, *Eucalyptus gunnii*, *Eucalyptus urnigera*, and *Eucalyptus coccifera*. These species I have found only on the mountains of Tasmania. I introduced them into Europe about four years ago, and highly recommended them for cultivation in colder parts of the continent. Since then the demand for the alpine species has increased, owing to their success in resisting heavy frosts, which have destroyed many other Eucalypti.

"'The following is a list of the quantities exported by me since 1874:—

"'10 lbs. *Eucalyptus gunnii*, at 30s. per lb.

"'10 lbs. *Eucalyptus coccifera*, at 30s. per lb.

"'2 lbs. *Eucalyptus urnigera*, at 30s. per lb.

"'The trees of *gunnii* and *urnigera* are felled for their seeds. *Coccifera* can be collected without cutting down the trees.'

"From the foregoing it would appear that there has not been more than 25 lbs. weight exported of these alpine species up to the present time. I believe the Messrs. Gulliver to have been the largest if not the only exporters of these kinds. Mr. F. Lipscombe, of this town, is the only seedsman who has these alpine species in stock, and he has not sold more than a few ounces of them.

"It will also be seen that the market value of the alpine species is 30s. per lb., while pure seed of blue gum is obtainable at from 7s. to 10s. per lb. Even supposing therefore that a similarity existed in the seed, it is highly improbable that the more expensive kinds would be used to adulterate that of less commercial value.

"As regards the plants produced from the seed supplied to His Excellency, whatever appearance they may have put on in their infantile state, I have not the slightest doubt that they will in time take the glaucous hue so peculiar to the young state of the blue glum. The absence of this glaucous appearance in these particular seedlings is only to be accounted for by the fact that they have been raised under artificial circumstances, or, in other words, too much coddled. I have had an opportunity of seeing a portion of the seed in question, and do not hesitate to pronounce it to be the genuine blue gum, or *Eucalyptus globulus*, and I am informed that a portion of the same seed had been previously supplied for sowing at the Cornelian Bay Cemetery, and that in canseqnence of its having germinated there so freely, it was selected for the Government House Grounds. I now produce seedlings from both places, and it must be admitted that, by an ordinary observer, not taking into consideration the different treatment the plants have received, they might be taken for distinct species, but there is nothing in their appearance which may not be accounted for by difference of culture.

"At the Cornelian Bay Cemetery the seed was sown in patches at intervals about the boundary fences, and left to chance. The result is, many thousands of seedlings, in various stages of growth, but all sturdy, and having the glaucous hue highly developed. At the Government House Grounds, on the other hand, the seed appears to have been sown in boxes and raised in frames, or otherwise shaded and protected. This treatment would necessitate frequent waterings over the leaves, which, in addition to the exclusion of the full influence of the sun would produce the difference in the appearance of the plants.

"I have been informed by His Excellency that when in New Zealand he had frequently heard it stated that spurious or inferior seed had been supplied as genuine blue gum. The difference of treatment to which the seedlings may have been subjected might perhaps be sufficient to account for this impression, but if, in reality, such was the case, I cannot think that the seed had been obtained from Tasmania. I have before stated that the seed of *Eucalyptus globulus* is so readily distinguishable from any other Tasmanian species, as to prevent the possibility of fraud, even supposing any inducement existed for it.

"I am not sufficiently acquainted with the numerous Australian forms of Eucalypti (about 140) to say whether there are any the seeds of which could be substituted for that of *Eucalyptus globulus*. Certain it is that several species have locally obtained the name of 'blue gum,' which are not identical with that of Tasmania, but I cannot say that they have ever been substituted for it.

"These notes have been made with the view of showing the improbability of the seed of any of the eleven known species of Tasmanian Eucalypti being substituted for that of *Eucalyptus globulus*, and if they have succeeded in doing so their object will have been attained."

The Rev. J. E. Tenison Woods, after a few prefatory remarks as to the importance of the collections of tertiary fossils made by Mr. R. M.

Johnston, read a paper on the anatomy and physiology of some Tasmanian Patellidæ. The paper was illustrated by many microscopical specimens and preparations.

The Bishop of Tasmania proposed a vote of thanks to the donors of presentations with special reference to the great gift of Mr. R. C. Gunn. His Lordship also moved a special vote to the Rev. Julian Woods for the very valuable paper they had just listened to, and in alluding to the greatly increased attendance of Fellows, attributed it in a great degree to the attraction which the able and original papers by the same learned author always exerted, and also to the warm and personal interest which His Excellency, both by his presence at the meetings and by his contributions, manifested in their proceedings. The vote having been cordially passed, the President left the chair.

INAUGURAL ADDRESS

BY

HIS EXCELLENCY F. A. WELD, ESQ., C.M.G.,

President of the Society, at opening of Session of 1876.

GENTLEMEN,—I have willingly acceded to the request that I should open this session of the Royal Society with an address, because I wish to take an opportunity of testifying the interest I feel in the Society, not only as its President and as Governor of the colony, but also in my individual capacity; and although I do not pretend to any special scientific acquirements beyond those common to most educated men, and must confess to having forgotten much which I formerly knew, there are, perhaps, some topics upon which I may touch without rashness or unduly presuming upon your patience. It is, gentlemen, a matter of congratulation that the Australian colonies, though hardly yet more than emerging from their infancy, have shown a great and increasing interest in scientific research. It might have been expected that the struggles of early colonial life and the hurry of business would have so fully occupied men's minds, that a generation or two would have passed by before scientific matters could have claimed attention, either from the people or Governments (Governments being, as a rule, such as the people make them, and a reflex of the people's mind). Yet, in nothing, I think, would an intelligent visitor from Europe be more agreeably surprised than by seeing the scientific departments and their work, the societies or institutes, and the museums and libraries of most of the principal cities of these colonies—for my own part, I feel pleasure in thinking that the establishment of the Colonial Government Museum at Wellington, New Zealand, and the establishment of a scientific department, with Dr. Hector at its head, took place under my auspices as Premier, much being due to the exertions and active assistance of Mr. Mantell, son of the geologist, and himself well-known to the world of science; that the first geological survey of Western Australia and Mr. Forrest's geographical discoveries were made under my rule as Governor there; whilst as a private individual I was instrumental in forming the Canterbury (New Zealand) Acclimatisation Society, and was its President when it obtained pecuniary assistance for your effort to acclimatise salmon and trout in these waters. I allude to these matters to show that I do not come to your meetings as a mere formal duty, but because I have in some degree been a fellow worker before I came amongst you. And, as after a long career as a colonist and politician, I look around at the growth and prosperity of this group of colonies, and feel a pardonable pride, as a labourer might on looking at an edifice in which he has placed a stone, that I too have contributed my mite to the work; so when I assist at your meetings or visit your museum, when I go to neighbouring colonies and see what they have done and are doing for the promotion of science; or when I receive such a work as the proceedings of the New Zealand Institute, containing varied and valuable information and papers from such men as Dr. Hector, Dr. Julius Von Haast, Captain Hutton, and others, it also seems a legitimate gratification to think that I have taken and am taking some little part, so far as in me lies, in extending the interest which is felt in scientific enquiries. And it is your Society, gentlemen, that here enables me to do so. And surely the advantage is very great to man that he should devote some part of his time and intelligence to studies which may be either profound and serious, if his time and capacity admit, or, if not, then of a lighter and more recreative nature; but which, as I propose to point out before I sit down, may even then be productive of results not only to himself but to the cause of scientific knowledge. The advantage is great, because a search for truth even in the material order, and a spirit of enquiry in those things which are given us by God to enquire into and exercise our intellectual faculties upon, is in itself elevating, and tends to develope our mental powers. Some good men seem at times to entertain a latent fear that scientific studies have in themselves a tendency to weaken faith in absolute and divine truth, rather than to "Lead from Nature up to Nature's God;" but truth in the abstract can be but one in essence; and scientific truth when fully known must, therefore, be at one with it, however speculative theories exhumed or evolved in the search for scientific truth may for a time seem to point to a different conclusion. Natural science has advanced with gigantic strides within a century, the progress of some of its branches, geology for instance, strong and rapid, has yet been not unlike, in one respect, to those chaotic revolutions which it contemplates and describes, where a peak rises and again sinks into seething lava, and is succeeded by another landmark, in its turn, too, to fall; still a guiding hand and a design unseen pervade all and tend to an end, and for the aftertime I look forward confidently to triumphs of yet a higher order for true science than even those great material ones which have distinguished our age over all previously recorded in history; but to attain this end, scientific studies, like others, must be followed in a right spirit, they must be given their proper place, and approached as Newton is said to have approached them, with that humble simplicity of mind which the poet Tennyson justly attributes to our greatest British warrior of modern times in the noble words,—

> "And as the greatest only are
> In his simplicity sublime."

True, indeed, this is a mark of the greatest minds, but it is a quality not inherent to outward greatness or ability, and the humblest student may, and should, possess it, and possessing it will possess a philosopher's stone of untold value. It is, of course, given only to the few to climb the heights of science, but the many who, perhaps, chiefly as a relaxation from the toils of their every day life, recreate themselves and bask on the sunny slopes that lie at their feet; even they, may not only gain knowledge and amuse their minds, but further, by careful examination of the natural objects around them, may collect facts which may furnish data for others of higher scientific attainments to collate, arrange, and draw conclusions from. In doing this, as I pointed out at one of our monthly meetings, care should be taken to preserve strict accuracy of detail, and to take heed not to be unconsciously led to square facts to preconceived theories, but to let them speak for themselves. There is great scope for this kind of work left in many branches of science, and in a comparatively newly settled country like this. I would especially refer to the provinces of geology, natural history, and botany. The Rev. Julian Tenison-Woods, at one of our meetings, when reading an interesting paper to us, made some observations on this point which impressed themselves on my mind, as no doubt on those of others. At my request he has lately furnished me with information and facts which illustrate the view I have just laid down, and I shall now avail myself of them somewhat largely. To begin with geology. Though much has been done—and Australia can boast of many scientific geologists whose contributions to science deserve and have obtained the most honourable recognition —still very little is accurately known of the stratigraphical relation of our paleozoic, fossiliferous, carbonaceous, and metalliferous rocks; very few of their fossils have been described; no good catalogue, I am informed, has been made of those already described. European forms are present; it would be interesting to know how many, and which? The relation in point of time of our volcanic rocks to the strata in which they exist would be an important object of inquiry. Have we any certainly tertiary basalts? How many different periods do they represent? What are their chemical characters? And do those afford a permanent test for their identification in different localities? In the mineral kingdom, no catalogue of minerals has been attempted since that of Count Strezlecki, which does not pretend to be complete. Valuable catalogues have been made in neighbouring colonies, but Tasmania is altogether behind hand in this particular, and yet, as it is known that gems exist in Tasmania, and her mineral riches are unquestionably very great, this should be a peculiarly interesting object of study to Tasmanians, as it is well known that the occurrence of basalts, greenstones, syenites, and granites—rocks which are common here—must give rise to sapphires, opals, rubies, and possibly even diamonds. In natural history, good observations on the comparative osteology of all our described marsupials are much wanted. Year by year observations on their habits will become more difficult to make, and many of the most rare of our fauna will become very scarce, if not extinct, within the space of another generation. Some Tasmanian birds, such as the emu, have become already extinct in this island; the apterix and the great owl-like night parrot, are following, in New Zealand, the fate of the Dinornis. What an interesting relic of the past would be a memoir of the habits of the Dodo, had some early visitor to the Mauritius spent a few hours in noting and describing them. Observations on the nests, eggs, and migrations of our birds might be made by any clever boy with a taste for ornithology; any observations would be worthy of record, and a well-arranged series would be of uncommon interest. In regard to fish—many Tasmanian fishes must be new to science—I myself, as one unlearned, was struck by the beautiful paintings of strange Tasmanian fish, which Mrs. Meredith with a kindness equal to her talent, painted for the Philadelphia Exhibition. Looking on their quaint and sometimes grotesque forms, one could not but hope that the mine of inquiry they indicated might be worked by some of our young Tasmanians, and that they, and other yet perhaps unnoted species, as well as our commoner sorts, might be compared with other Australian fish, and those of more distant regions. Indeed some of the quaint ones to which I have alluded, reminded me forcibly of the strange forms of life that I have wondered at amongst the sea weed of the Sargasso sea floating out into the Gulf Stream in the Atlantic. The anatomy of fishes is also a field in which very much remains to be done. In the Mollusca proper I am told that everything has to be done amongst the Pteropods. The Gasteropods offer a wide field for investigation in accurate determination of species, in details of anatomy, in dependence of form and colour of shells on sex, from absence of any facts regarding which I learn that many male and female of the same species have been regarded as different; observations are required on the lingual ribbon, to which the Rev. Julian Woods has already, at a meeting last year, directed our attention, and which is a matter of great value for the determination of species. I might here give a long list of families of which little or nothing is known; for instance, our Polyzoa, several new forms of which have been observed by the distinguished correspondent of your Society to whom I have just made reference. We have also many new and interesting forms of Crustacea on which the light of science has scarcely been thrown. Of the Echinodermata several orders remain untouched. Then—to come to the science of Botany; a science which leads to the contemplation of such exceedingly beautiful objects, and organisations of such wonderful interest and delicacy, that the devotion of its votaries to their favourite pursuit can be no matter of wonder. Much has been done in Australia by many eminent men in regard to Botany. I need only allude to the labours of Baron von Müeller, of Victoria, as one instance, and Tasmania in this branch has been distinguished by the researches of Mr. Ronald Gunn and the late Mr. William Archer—but it would be a mistake to suppose that their efforts, not to go back to those of Robert Brown, Sir Joseph Banks, Solander, Cunningham, Labillardiere, Hooker, Bidwell, and others—have exhausted the field; on the contrary no country affords a more favourable opening for further researches, and it would be well if students would satisfy themselves that such is the case, and even should the gleaners' toil fail in discovering many new species in Tasmania, yet our knowledge of the habits of actually discovered plants is but limited. Little is known about the fertilisation of Tasmanian plants. I need not remind you of the curious contrivances by which the fertilisation of the ovary of some plants is contrived, and especial interest attaches to orders such as Orchideæ, Protaceæ, and Filices, which exist abundantly in this colony. Dr. Bentham, the distinguished President of the Linnæan society, especially commends to the attention of Australian botanists the fertilisation of the ovary of Goodenovieæ. Again, how little is known of the medicinal and economic uses of our plants. Baron von Müeller and Dr. Schomburgk, of Adelaide, have devoted much attention to that point in Australia. Observations on the structure of plants in their various parts, and the action of their juices, must also be a fascinating pursuit. I remember, years ago, being much pleased with a collection of wax models, showing the leaf and stem anatomy of plants and their cellular structure, in the museum of Florence in Italy. It has ever since seemed to me to be a most interesting object of study. The preceding remarks will, I trust, have illustrated the view I have proposed to you, and have shown that it is in the power of many of us to add our mite towards the solution of many very important scientific problems. It would, moreover, be easy to show how the habit of close observation of nature adds to our pleasure and refines our minds. Not a living creature, not a leaf, not a shell, but may be studied with profit and pleasure—"the lilies of the field, how they grow!" There is a charm about the mere love of simple nature that seems like an electric fluid to pervade and purify the spirit of its devotees, and to open itself in their writings—such is the charm that runs through the essays of Waterton and his Wanderings and Autobiography, that breathes in the works of White, of Selborne, and of old Izaak Walton, a name, like the motto on the fishing house he immortalised, "Piscatoribus Sacrum." These are books which I should like to see often in the hands of boys in the colonies. I am sure that they exercised a beneficial influence on my boyhood at home and my early life in the colonies. How often I remember, wandering as a boy, fly-rod in hand, along some Dorsetshire or Devonshire stream, and whilst tempting the trout from rippling fall or shady pool; with what pleasure one watched the quaint waterhen, and caught the rapid flash of the glancing kingfisher. How one followed, gun in hand, the jay and magpie from orchard to covert; and waited by hedge-row or fern brake for the rabbits at sundown. How interested the boy's mind became in every natural object around, till the heavy winged white owl came out and the night closed in. And, later in life, exploring up among the snow sprinkled ranges of the Kaikoras in New Zealand, how often have I lain awake to watch the bold, not to say insolent familiarities of the Weka or Wood-hen, pecking round the embers of the fire, and not unfrequently abstracting precious articles placed by what served as your pillow for greater security, such as soap, or comb, or pipe, dear to the bushman, "ea sola voluptas," I will not add "solamenque mali." Incorrigible birds! I have known them (undismayed by stick or stone) to return at once and follow up such petty larcenies by a combined and determined attempt to drag a waterproof from the prostrate form of a sleeping fellow traveller. We have most of us some such memories to amuse us, and the habit clings through life. I still delight in the parrots and flycatchers and magpies about the Government House grounds; and take pleasure in seeing the fat, lazy tench basking under the willows, and the stout, pursy perch come bristling up amongst them full of a fussy self-importance that is quite a caricature on poor humanity; perhaps we might draw morals even from fish had we an Æsop amongst us, but at all events I believe that we should generally be happier—possibly even better—did we learn to enjoy and take lessons from the simple contemplation of nature as we see it in our every day life, or in those country excursions from which, happily, few in these colonies are debarrred. Your society, and the efforts of those interested in acclimatisation, have done much to promote this, and you have laid the foundation for more by the Library, the Botanical Gardens, and the Museum. I cannot but refer here to the success which has now admittedly crowned the efforts of the commissioners of your Society in the introduction of salmon, of trout, and of other fish into this hemisphere. The experiment reflects the highest credit on this colony, on the public-spirited gentlemen who were the promoters, and on those who assisted and supported their efforts. To all connected with this undertaking, the gratitude of future generations of Tasmanians, and indeed of all Australasians, is due. If the name of the man who introduced the cherry into ancient Rome and Italy has been preserved, how much more worthily may those be remembered who have introduced into the southern hemisphere fish, not only destined to become hereafter a product of great commercial value, but I trust, moreover, to encourage that love of field sports and country pursuits which has so deeply coloured English life, and, in my opinion, produce such happy results on the national character. To turn to another point, there is your botanical garden, which may favourably compare, whether for beauty of site or the trees and shrubs it contains, with those of much larger and more wealthy communities. What you want in connection with it is an extensive nursery ground, not to compete with professional gardeners, but to grow things they cannot or do not supply, and to raise a large quantity of young trees for the Domain. I must for a moment digress to say, that beautiful as it is from situation, it is positively painful to go through the Domain. Almost a year ago, at your request, I marked some trees as a beginning to get rid of rubbish, and open out views. From want of means these trees I think are not all cut down yet; if so, very recently; and there are fifty times as many dead, dying, unsightly, and obstructive trees that ought to be removed, and, moreover, simultaneously a beginning of planting should be made. I must express a hope that some effort will be made, whether in the way of private subscription or public grant it is not for me to suggest, but I will only repeat my promise of affording such aid as may be desired and be in my power to give, in whatever may be undertaken to preserve and improve the naturally beautiful recreation ground of the people of this city—a people who by their orderly and cheerful demeanour, the healthy, neat, and pretty appearance of the women and children last regatta day, when many thousands picnicced in the Domain—fully proved themselves worthy of anything that can be done for them in improving the

Queen's Domain and their's. But to return to the Gardens. Whilst I am on the subject pray permit me to record a remonstrance against the proposal to lower or pull down the stone wall against which so many beautiful creepers grow, and which is such a shelter to the beds that lie below it; and border what is now a charming winter walk. I own that from the entrance side it is at present unsightly but my principle is reform where practicable, not destruction; and I say with Mr. D'Israeli "Level up!" make a broad terrace-walk along the wall level or nearly level with its top, on the entrance side; and put a stone balustrade or even a few stone vases or similar ornaments along its top. From this terrace you would command a magnificent view over the gardens, the Government house grounds, and the expanse of river with the surrounding mountains. It would be a great feature if not the great feature of your Gardens, unique in these colonies, and unsurpassed anywhere. The terrace should be broad, the side towards the entrance should be either faced with stone or grassed with turf—make the terrace, if you like, in a concave form to leave an oval space for the carriages below, gravel your terrace, but run a ribbon bed along it, and place beds, filled with masses of colour such as geraniums afford, in the expanding angles—your sweep should be continued round the opposite side of the second or inner entrance, which should be just above and near the cottage. Such is my idea, perhaps it may be found worthy of consideration before a final decision is arrived at. I have only one further remark to make regarding the Garden. Its weak point is a lack of grassy plots and lawns, owing, I understand, to the difficulty of getting a grass that will stand both our drier summers and our colder winters, as the Indian couch used in warmer colonies will not stand frost. I have written to Dr. Hooker, of the Kew Royal Gardens, about a plant which was introduced into England some years ago as a substitute for lawn grass, and which, I think, would answer admirably and need no mowing. Dr. Hooker informs me that he is sending out a case of Cork oaks, which will be of much value to this colony. I would also suggest that duplicates of such pines, taxads, cypresses, and other trees, as, not having room, must soon either be cut down or spoil one another, should be planted not less than eighty feet apart, in the new portion of the grounds. I may be forgiven if I further observe that in Franklin

Square one or two beautiful and valuable trees which might become an ornament to the city, and last for generations, if allowed to develop themselves, will shortly be ruined for want of room, unless others less valuable are removed. Let me also, before I conclude, put in a plea for the preservation of the ferns and forests which are fast disappearing from the sides of Mount Wellington. With them will disappear one of the attractions which make your city such a favourite with visitors; the sides of Mount Wellington ought to be preserved to future generations as a noble public forest and park, not allowed to become a dreary hideous wilderness. Acres of bastard gums are cut down, and, as I am informed, for the sake of their seed, which is sold as blue gum seed, and a shameful injury is thus inflicted upon those purchasing and using the seed, and upon honest seedsmen, and the credit of the colony. It now only remains for me to say that the retrospect of the year must, on the whole, be satisfactory to our associates. The attendance at meetings of the Society has, I understand, been above the average of former years, and certainly papers of much interest have been read, whilst several new associates have been enrolled, and donations of value have been made to the Museum and Library. One scientific botanist, Mr. William Archer, has passed from amongst us. Owing to the shortness of my residence in this colony, I had not the pleasure of his personal acquaintance, but his acquirements and industry are well known, and he was highly respected as a colonist of old and high standing. It is to be hoped that his collection will be secured for your Society and the colony, in accordance with the recommendation of Dr. Hooker. Last year Tasmania was honoured by a visit from the American scientific expedition sent out to observe the transit of Venus; since then no event of special scientific moment has come immediately before us. But we, in a colony once ruled by Sir John Franklin, who lost his life in the service of science and of his country in the Arctic regions, sitting, as we do, almost under the shadow of his statue, cannot but turn in spirit to those polar seas, where, at the further extremity of the globe, British seamen, keeping up the traditional spirit of our race, are braving waves and icy wildernesses in the cause of science, and for the honour of our flag. All our good wishes go with them, and we may believe that even they are cheered amidst perils and hardships and (more difficult for them, and such as they, to bear) perhaps long periods of forced inaction, by the thought that wherever the sea rolls, from west to east, from their frozen north even unto our, from them, remotest south—there are English-speaking men—aye, and others too, for science binds men of different nations together—to look upon their devotion with pride, and to whom the news of their safety and success would be a triumph and a subject of heartfelt thanksgiving. May such be the result. With these remarks, gentlemen, I will now take the chair, which, as your President, I hope to fill on many future occasions.

ON THE CODLIN MOTH, (*CARPOCAPSA POMONELLA.*)

BY HIS HONOR MR. JUSTICE DOBSON.

[Read 11th April, 1876.]

For some years past the apple orchards in the northern parts of this colony have almost ceased to be productive. Every grower of apples there knows how liable his fruit is to be worm-eaten ; he finds basketsful of windfalls even in the calmest weather, and he is aware that the cause of the loss is a small grub which has fed upon the pulp of the fruit. The ravages of this insect are not wholly confined to the apple, but have in some cases extended to crops of pears. This grub has made its appearance in some of the gardens in the vicinity of Hobart Town; it is said to have been observed here three years ago, and up to the present time it has not been the cause of loss to any serious extent in the Southern orchards. The history of these grubs, and how and when they get into the apple may not be generally known. The grub precisely answers in description, and in the mischief it does amongst the apple orchards, to the Codlin grub of England and America, and although it is impossible at this season of the year to obtain the moth there can be little doubt that it is, if not identical with, at least most closely allied to the Codlin Moth, and I have for the purposes of this paper assumed it to be so. The grub is the larva of the Codlin Moth, "*Carpocapsa pomonella*" of some entomologists, but "*Tinea pomonella*," "*Pyralis pomona*," and "*Tortrix pomoniana*" of others. The Moth is about three-quarters of an inch in expanse ; its forewings are ashy brown, the hind wings are a reddish brown, tinged with yellow. The moth lays its eggs in the eyes of the young apples—one egg in each apple—by inserting its long ovipositor between the divisions of the calyx. As soon as the egg is hatched, the little grub gnaws a hole in the crown of the apple, and soon buries itself in the substance. The grub itself is of a dirty-white colour, with a brown head varied with darkish-brown marks. The body is slightly hairy : the first segment after the head is whitish, with minute brown spots ; the other segments are of a pale colour, with about eight small tubercles on each. Each of the anterior segments is furnished with a pair of legs ; and there are a pair of feet at the extremity of the body. In its early state it is of a dirty-reddish colour. The grub chiefly feeds upon the pulpy parts of the apple. When it has nearly attained its full size it feeds on the pips of the apple, which, thus attacked in its most vital part, soon falls to the ground. On the fall of the apple the grub quits the fruit by the passage which it has previously gnawed. A hundred fallen apples may be opened and not more than two or three grubs found within them : the orifice by which they have escaped being open and no longer concealed by the little mass of brown grains, which is the case with those apples from which the grub has not made its escape. These little grains are the excrement of the grub. On leaving the apple after its fall the grub or caterpillar wanders about the ground till it finds the stem of a tree, up which it climbs, and hides itself in some small crack in the bark. It gnaws away the bark a little, and having made a smooth chamber, spins a little milk-white silken case, in which, after a few weeks, it becomes a chrysalis In this state it remains through the winter, and, in the northern hemisphere, till the following June;—In Tasmania, probably till the end of November, and is to be seen early in December hovering round the apples on a midsummer evening The exit of the grub and its wandering to a place of safety are said usually to take place in the night. It is evident from the habits of the insects that their destruction is attended with great difficulties. The presence of the grub in the fruit is unknown till the little brown excrementitious grains appear on the exterior of the apple, at the orifice of the tunnel which the grub bores from the core through the pulp to the surface, and the mischief is then accomplished. The small size of the moth, its nocturnal habits, and its practice of secreting itself in crevices of the bark render its destruction most difficult. The only known means of preventing the spread of this pest appear to be—1. To gather up the worm-eaten fruit as soon as it falls, and before the grub has escaped, care being taken to destroy the grub, as by putting the apples into water, boiling them for pigs' food, or burying them. 2. To destroy the cocoons in autumn and winter. 3. To light fires in the orchard on midsummer evenings, by which the moths are attracted and destroyed. In some parts of America the cuttings are saved when pruning the trees, in order to make fires in the June evenings to destroy these moths. 4. To preserve all insect-destroying birds, especially night-feeding birds, which are peculiarly harmless, and also peculiarly serviceable to man.

ON A NEW GENUS OF NUDIBRANCHIATA.

Fam. Elysiadæ.

By the Rev. J. E. Tenison Woods, F.G.S., F.L.S., Corr. Mem. Roy. Soc. Tas., &c.

The Elysiadæ are shelless mollusca with no distinct mantle or respiratory organ, all being performed by the ciliated surface of the body. The stomach is central; the hepatic organ branched, extending almost the whole length of the animal; eyes sessile, and tentacles simple or obsolete.

There are five known genera of the family, viz.:—Elysia, with tentacles; Actæonia, leech-like and with tentacles; Genia leech-like, linear dorsal tentacles; Limapontia, head truncated and with arched lateral ridges; Rhodope, worm-like.

To this family I have found an addition of marked and peculiar generic character. This new genus I propose to dedicate to Mr. Morton Allport, as a slight mark of appreciation of his great services to science and acclimatization in Tasmania.

ALLPORTIA, Nov. Gen.

Corpus expansum, tenue, antice et postice omnino complanatum, occulis submarginatis.

Allportia expansa. *n.s. Corpus supra olivaceum, pede pallidiore; occulis appoximatis punctis parvis atratis numerosis, compositis; infra lineis ramulosis albis (hepaticis?) conspicuis.*

Animal expanded thin, leaf-life, with no distinct foot, eyes anterior; body without tentacles or ridges.

Allportia expansa. *n.s.* Animal of a deep olive above, smooth; eyes close together and slightly raised about one fourth of the whole length within the anterior edge. Under the lens the eyes appear to be composed of many minute dots. No other organ visible above. Foot much paler, the hepatic organs appearing as a creamy white branching plume down the median line. Length, 30; breadth, 20 millimetres. Common under stones among the rocks at Southport.

This singular mollusc moves with some rapidity like a pale gelatinous expansion of extreme tenuity. Though without shell or apparent muscles, it has such contractile power that it can move itself in any direction and raise itself nearly erect. While the highly organised testaceous mollusca can move only with difficulty, this delicate creature can recover its position at once easily, even when placed on its back. It is of such extreme tenuity, however, that on being placed in spirits it becomes opaque, and the details of its structure are lost. Type specimens are preserved for the Museum.

CONTRIBUTIONS TO THE PHYTOGRAPHY OF TASMANIA.

By Baron Ferd. von Mueller, C.M.G., M.D., F.R.S.

(IV.)

The majority of the notes, offered now to the Royal Society of Tasmania, were written more than a year ago, being the result of various researches on Tasmanian plants since I had the honour of submitting the third contribution; but this offering was delayed, because it was my wish to follow up some field-work, which I instituted in Midsummer of last year, while travelling, accompanied by Mr. S. B. Emmett and his son, from Circular Head to the Arthur River, chiefly, with a view of making some special comparisons between the vegetation of North-west Tasmania and that of the opposite coast of the colony of Victoria. This wish of revisiting the island could not yet be realised; and as there seems to be much uncertainty when effect could be given by myself to such a desire for further Tasmanian phytographic explorations, I deemed it best to submit my ready notes, especially as they became disinterestedly augmented by communications of plants and memoranda from Mr. Robt. M. Johnston who, as a companion of the Hon. J. R. Scott, traversed for scientific purposes last autumn a large tract of alpine country, also not previously examined for plants. Furthermore the present contribution has been greatly enriched by notes furnished by the Rev. W. W. Spicer, who, chiefly by the aid of friends, obtained plants from several localities of Tasmania previously but little searched, and who is likely thus to advance greatly our insight into the exact geographic distribution of the species over the main island and the adjoining islets.

Some Algæ have also been added from more recent collections perseveringly formed by Mrs. Meredith, and through my mediation rendered available to Dr. Agardh of Lund, the great worker for a very long time on the oceanic plants.

Melbourne,
March, 1876.

** *Ranunculus muricatus*, Linn. New Town, in a wet ditch on the road to Risdon Ferry. It is very similar to the native R. parviflorus Linn., but larger and coarser. W. W. Spicer.

Papaver aculeatum, var.: pusillum, King's Island, Neate. The whole plant barely three inches high. Stem capillary; leaves only 2 to 5 lines long; length of calyx hardly above two lines.

* *Cakile maritima*, Scopol. Flor. Carniol. ii., 35. On the coast near Circular Head, not uncommon, particularly near high water mark. It is remarkable that this conspicuous and singular plant should have been overlooked so long in Tasmania, where, from my personal enquiry among the local coast residents, it seems to be indigenous; but it was also not before 1861 that the Cakile became by my own investigations discovered on the coast of the Australian mainland. George's Bay. A. Simson.

** *Senebiera coronopus*, Poir. An European weed now firmly established in the neighbourhood of Hobart Town. though evidently of much later introduction than S. didyma Pers.

Drosera binata, La Bill. Southport, J. E. T. Woods; Port Davey, J. R. Scott.

Drosera Menziesii, R. Br. Gould's Country, George's Bay, A. Simson.

Pittosporum bicolor, Hook. Gould's Country. A. Simson.

* *Pittosporum undulatum*, Venten., hort., Cels. t. 76. Very rare in the mountainous forests near the Arthur River. The credit of the discovery of this beautiful tree is due to Messrs. Emmett, who directed my attention to this plant as new for Tasmania by sending me a coloured drawing, prepared by Mrs. Emmett, and who subsequently conducted me to the spot, where long since the only tree originally observed by them was felled. Such is the equable moisture of those ranges, that the stem, after having been severed from the root for several years, had pushed forth some new foliage; this with the drawing of the flowers has left hardly any doubt of the identity of this Pittosporum with the true P. undulatum, which is known to extend to Western Port on the Victorian coast; fruits from Tasmania have, however, not yet been seen by me. I learn that a few more trees of this noble species were noticed since in the same region.

Comesperma ericinum, Caud. Gould's Country, A. Simson; Honeywood, J. E. T. Woods.

Comesperma calycomega, La Bill. George's Bay, A. Simson; Southport, J. E. T. Woods.

Comesperma defoliatum. At Gibson's Plains, and on other heath tracts towards the River Arthur.

Australina pusilla, Gaud. In a damp gully, creeping among moss, etc., near the Fern Tree Bower, Mount Wellington, W. W. Spicer.

Eriostemon virgatus (the Button Rush). In thickets of Bauera, and among Chœtospora sphærocephala towards and near the Arthur River in vast abundance.

Eriostemon squameus. King's Island, Lieutenant Stanley, R.N.

Eriostemon montanus, F.M. Plants indigenous to the colony of Victoria, I. 129. Summit of Mount Lomond at a height of nearly 5,000 feet, among masses of greenstone; Dr. Milligan. It occurs first named in my plants indigenous to Victoria, I. 129.

Boronia rhomboidea, Hook. Sparingly at North West Bay, near the inn, W. W. Spicer.

Frankenia pauciflora. Circular Head.

** *Cerastium glomeratum*, Thuill. New Town, W. W. Spicer; Mount Wellington, P. E. Spicer.

** *Sagina apetala*, Linn. Mantiss, 559; King's Island, Neate.

** *Spergula arvensis*, Linn. Cultivated ground near Hobart Town, W. W. Spicer.

Polycarpon tetraphyllum. Circular Head.

Claytonia australasica. J. Hook, Pontville, W. W. Spicer.

Hemichroa pentandra, R. Br. On saline meadows near Circular Head.

Ptilotus spatulatus, Poir. Pontville, W. W. Spicer.

Rhagodia nutans, R. Br. On a wall, Hobart Town, some distance from the Derwent, and in a neighbouring cemetery, W. W. Spicer.

Atriplex paludosum, R. Br. Wet saline flats about Circular Head.

Salicornia arbuscula, R. Br. Circular Head. Flinders Island, R. M. Johnston.

Rumex bidens, R. Br. In the River Jordan, Pontville, W. W. Spicer.

Platylobium formosum. Swanport, Dr. Story; Harefield, Mrs. Groome; George's Bay, Bissill; St. Patrick's River, Hannaford; Gould's Country, A. Simson.

Platylobium triangulare. York Town and Port Sorell, C. Stuart.

Glycine clandestina, Wendl. George's Bay, A. Simson; Pontville, P.E. Spicer.

Swainsona lessertifolia. King's Island, where it is dreade as a weed, poisonous to pastoral animals.

**Trifolium tomentosum*, L. sp. pl. 1086. Near Circular He rather frequent, and permanently established.

Tetracarpaea Tasmanica. River Picton and Lake Pedder, Johnston; Gould's Country, A. Simson.

Anodopetalum biglandulosum. Adamson's Peak, Hon. J. R. Scott; mountains towards and along Arthur's River, F. v. M.; River Picton and Lake Pedder, Johnston. Leaves sometimes trifid or trifoliate. Well known as the "horizontal scrub" to form in many valleys of Tasmania dense jungles, almost impenetrable.

Eucryphia billardieri. Adamson's Peak, Hon. J. R. Scott; towards Arthur's River, F. v. M.

Bauera rubioides, flore pleno. Deloraine, J. E. T. Woods.

** *Alchemilla arvensis*, Scopol. fl. Carniol I, 115, King's Island, Neate. This plant was not admitted by me into the census, published in the Society's volume for 1874, inasmuch as the plant cannot be regarded with certainty as indigenous. I traced it into New South Wales as far as the Edwards River. Its claim to nativity in Australia may remain for ever a disputable point. A. vulgaris is, however, truly indigenous in the glacier-region of the Australian Alps, and may possible yet be discovered in the snowy mountains of Tasmania also.

Geum urbanum, Linn. Deloraine, J. E. T. Woods.

Tillœa macrantha, J. Hook. Pontville, also near Hobart Town; W. W. Spicer.

Haloragis ceratophylla, Endl. Pontville, a variety with strictly opposite leaves, W. W. Spicer.

Ceratophyllum demersum, Linn. The river Jordan at Pontville, W. W. Spicer.

Lythrum Salicaria, Linn.
Deloraine, J. E. T. Woods.

Lythrum hyssopifolium, Linn.
Deloraine, J. E. T. Woods.

Kunzea corifolia. King's Island, R. Johnston.

Spyridium eriocephalum. Hummock Island, Dr. Milligan; Schouten Island, Dr. Story. On both islands the variety vexillifera.

Spyridium serpillaceum. Spring Bay, Dr. Milligan.

Spyridium obovatum. St. Paul's River, where it is 4 to 10 feet high. Spyridium Gunnii, Eldon's Bluff, Th. Gulliver, is probably a variety of S. obovatum.

Cryptandra amara. Swanport, Dr. Story. In all probability the C. alpina must be regarded as a highland variety of C. amara.

Pomaderris phylicifolia. St. Paul's River, C. St.

Pomaderris racemosa. King's Island, McGowan.

Conospermum taxifolium. George's Bay, A. Simson.

Cenarrhenes nitida. Adamson's Peak, Hon. J. R. Scott; River Picton, River Huon, and Lake Pedder, Johnston; between Circular Head and Arthur's River, F. v. M.; Upper Arve, J. E. T. Woods.

Agastachys odorata. On heathy hills between Circular Head and Arthur's River, very rare, Emmett; Lake Pedder, River Picton, and River Huon, Johnston; Adamson's Peak, Hon. J. R. Scott; Upper Arve, J. E. T. Woods.

Orites diversifolia. River Picton, Johnston.

Bellendena montana. Mount Ramsay, Emmett; Adamson's Peak, Hon. J. R. Scott.

Pimelea ligustrina. Gould's Country, A. Simson; Deloraine, Southport, J. E. T. Woods.

Panax Gunnii. Lake Pedder, Johnston.

** *Torilis nodosa*, Gaertn. de fructib. I., 82. Copiously naturalised at Circular Head.

Hydrocotyle callicarpa, Bunge, near New Town, sparingly, W. W. Spicer.

* *Fœniculum vulgare*, Gaertn. Abundant at Sandy Bay, W. W. Spicer.

Didiscus pilosus. Swanport, Dr. Milligan; Goshen Road, A. Simson.

Asperula oligantha, F. M. in Neerland. Kruitk. Archiv. IV., 111 et 112. In the 9th volume of my Fragmenta, p. 187, it was proposed to substitute the above name for that of A. conferta, as incautiously adopted in the census; because very many years ago the appellation of A. oligantha became established in the Dutch journal above mentioned for that variable species, which already in 1848 I recognised as the only Australian one, and then named it A. oligantha (unaware at the time of Dr. Hooker's views), in contrast to the common A. odorata of Europe. The adoption of the specific name conferta as a collective name for the several supposed species formerly described would be apt to lead to confusion.

Galium umbrosum, Solander in G. Forster's Floral. insul. Austral. prodr., p. 89, includes as varieties both G. gaudichaudi and G. ciliare. Furthermore G. Australe includes as one of its forms G. albescens, and seems to stand in the same relation to G. umbrosum as G. aparine to G. spurium.

Nertera depressa has been reduced to Coprosma, as C. nertera in the Fragm. phyt. Austr. IX., 186.

Aster myrsinoides, La Bill. The variety erubescens occurs at Goshen Road, A. Simson.

Aster lepidophyllus. Circular Head.

Cotula reptans, Benth. Pontville, W. W. Spicer.

** *Bellis perennis*, Linn. New Town, W. W. Spicer.

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Gnaphalium candidissimum, Lam. On the eastern shore of Kangaroo Point, growing in the sand in considerable quantities. In contributions, &c., No.III. (Proc. R.S.T. 1873, p. 61) this plant was noted as found "in the vicinity of Hobart Town, on roadsides and in cultivated fields;" and it is added: "This is the first knowledge which we possess of this pretty species having strayed out of its native home, South Africa." W. W. Spicer.

Gnaphalium Japonicum, var. sciadophora. Near Lake St. Clair, Th. Gulliver. In this curiously aberrant form the capitula are singly pedunculate and dispersed.

Helichrysum dealbatum. Circular Head.

Helichrysum pumilum. Lake Pedder, Arthur and Huon Plains, Johnston.

* *Helichrysum Gravesii*. This fragrant shrub, to which attention was first directed by Mr. Graves, came probably from the South of Tasmania. It is allied to H. cuneifolium and H. Backhousii, differing from both already in the form of its leaves.

Senecio velleyoides. Honeywood, W. C. Blyth; Gould's Country, A. Simson.

Senecis lautus, var.; capillifolius. Sandy Bay, W.W.Spicer. Near Circular Head, T. Stephens.

** *Onopordon acanthium*, Linn. This very handsome thistle appears in a few places about New Town. W. W. Spicer.

** *Carduus marianus*, Gaertn. Common about New Town. W. W. Spicer.

** *Centaurea melitensis*. New Town, W. W. Spicer.

** *Calendula arvensis* and its more showy ally C. officinalis are both thoroughly established at New Town. W.W. Spicer.

Crepis virens, Linn. Deloraine, J. E. T. Woods.

** *Xanthium spinosum*, Linn. (Bathurst Burr). Near the Railway Station, Hobart Town. This very troublesome weed also exists near Launceston; but it does not appear to spread with such rapidity in Tasmania as it does on the Australian continent. W. W. Spicer.

Microseris Forsteri. This plant is mentioned here for several reasons; first, because its extraordinary variability of the pappus is not yet fully recorded; I counted from 10 to 60 setæ or paleæ, more frequently scabrous than plumous, which when numerous are generally most slender, but when fewer often all broad; secondly, in alluding to this plant, which by careful culture might yield a new esculent root for cold countries (it prospering most on our snowy mountains), an opportunity is afforded for pointing out that it was Solander, who in Forster's prodromus called this plant Scorzonera scapigera; it being not generally known that in that prodromus as far back as 1786 the first use was made of attaching to the specific names of any plants the initials of their author, from whom the appellation first arose, a custom which became universal since the earlier part of this century. In Forster's prodromus occurred also for the first time the names of Ranunculus rivularis and Mesembryanthemum australe., both given by Dr. Solander.

Lobelia surrepens. Swanport, Dr. Story.

**Lobelia platycalyx*, F.M. fragm.phyt.Aust. IV., 183. Settlement Island, Dr. Milligan (896). The staminigerous plant only obtained.

Lobelia pratioides. Hobart Town, Hannaford ; Spring Bay, Parson's Pass, and Brushy Plains, Dr. Milligan (1297); a short leaved variety, which seems identical with Pratia puberula ; but the fruit has not been available for comparison.

* *Lobelia Browniana*, R. and S. syst. veg. V , 71. Mersey, C. St. ; also under 259 in Dr. Milligan's collection.

* *Lobelia microsperma*, F. M. fragm. X., 41. In various parts of Tasmania. As explained in the work above quoted, this plant is the L. gibbosa of R. Brown, but at least as far as the fruit is concerned not Labillardière's L. gibbosa, which latter belongs so far to the following species. The extreme minuteness of the seeds distinguish at once L. microsperma and L. Browniana. The ambiguity of Labillardière's plant renders it almost unavoidable to abandon the specific appellation given by the French naturalist.

Lobelia simplicicaulis, R. Br. prodr., 564. Intermixed with the foregoing species. The large seeds, well described by Labillardière as triquetrous under his L. gibbosa, bring this plant nearer to the East Australian L. dentata than to L. Browniana and L. microsperma. Most likely Labillardière did not recognise the differences between L. implexicaulis and L. microsperma, and gathered both promiscuously ; whereas R. Brown, although he well distinguished the two species, seems not to have perceived the remarkable difference of the seeds.

Lobelia pedunculata, R. Br. Goshen, A. Simson.

Leeuwenhoekia dubia, Lond. Pontville, W. W. Spicer.

Phyllachne bellidifolia, F. v. M. River Picton, Johnston.

Dampiera stricta, R. Br. Boobyalla, J. R. Scott.

Scævola hookeri, F. v. M. Goshen, A. Simson.

Selliera radicans, Cav. Port Esperance, J. E. T. Woods.

Lyonsia straminea, R. Br. Honeywood, J. E. T. Woods, the most southern locality, I believe, in which this plant has been observed. W.W.S.

Convolvulus sepium, Linn, var. soldanella George's Bay, A. Simson.

Styphelia pinifolia, Spr. Gould's Country and George's Bay, A. Simson.

Styphelia scoparia, R. Br. The first authority for this plant is Smith's specimen of the Botany of New Holland, p. 48. 1793.

Prionotes cerinthoides, R. Br. Adamson's Peak, J. R. Scott; Lake Pedder, Johnston; a variety with flesh coloured flowers occurs.

Richea pandanifolia, J. Hook. Lake Pedder, Johnston; also beyond the River Arthur, Emmett.

Epacris microphylla, R. Br. Gould's Country, A. Simson.

Trochocarpa disticha, var. Cunninghami. Picton River, Lake Pedder, and Huon River, Johnston.

Limnanthemum exaltatum, F. M. fragm. IX., 165. In the elaboration of the census it was overlooked that the genus Limnanthemum has 21 years' priority over that of Villarsia. The names of Villarsia exigua and V. Gunnii have therefore also been changed accordingly.

Gentiana saxosa, R. and G. Forster in Svensk Wetensc. Akad. Handing., 1777, p. 183, t. 5. This is the oldest record of the Australian Gentiana.

Sebæa ovata, R. Br. Pontville, P. E. Spicer, very dwarf; New Town, W. W. Spicer.

Utricularia lateriflora. Near Arthur's River.

* *Westringia rosmariniformis*, Sm. tracts 277, t. 3. South Esk near Launceston, and Tamar near George Town; Hannaford. Undoubtedly the typical plant in every respect, although as a Tasmanian one it has been referred by Bentham to W. brevifolia as a variety. No transits are as yet known to occur, but if such should be found, then Sir James Smith's plant, on which the genus was actually founded, must take precedence.

Westringia brevifolia. Mersey River, C. St.

Westringia angustifolia. River Picton, Johnston.

Teucrium corymbosum, R. Br. Pontville, W. W. Spicer.

Solanum vescum. King's Island, Lieutenant Stanley.

Glossostigma elatinoides. King's Island. The recent discovery of a remarkable Limosella in South East Australia has led to a modification of the characteristic of the latter genus, and by analogy this alteration affects also the allied Glossostigma so far as to render its reduction to the older genus Microcarpaea desirable.

Limosella aquatica. C. St.; Circular Head.

** *Linaria cymbalaria*. Mill. Hobart Town and New Town, W. W. Spicer.

Veronica plebeja. Macquarie Harbour; Dr. Milligan.

** *Veronica hederefolia*, Linn. New Town, W. W. Spicer.

* *Plantago Lagopus*, Linné, sp. pl. 114. Recently of spontaneous occurrence on waste places near Hobart Town, W. W. Spicer.

** *Plantago major Linn.* Sparingly, Hobart Town, W. W. Spicer.

Fagus Gunnii. Lake Pedder, Johnston.

Vallisneria spiralis, Linn. The River Jordan, at Pontville, W. W. Spicer.

** *Anacharis canadensis*, Planch. Was first introduced into the colony about the year 1862, when specimens were discovered in the reservoir, supplying the basin in the Franklin Gardens, Hobart Town, where they are still thriving. It has now found its way to the River Jordan, at Pontville, and will no doubt soon be heard of in other localities. W. W. Spicer.

Dipodium punctatum, R. Br. Gould's Country, A. Simson.

Pterostylis præcox, Lindl. Goshen, A. Simson.

Caleana major, R. Br. George's Bay, A. Simson.

Acianthus exsertus, R. Br. Gould's Country, A. Simson.

Lyperanthus nigricans, R. Br. Gould's Country, A. Simson.

Spiranthes Australis. South Esk, Johnston.

Thelymitra aristata. On the Derwent, W. W. Spicer; Port Arthur, J. Coverdale.

Chiloglottis Gunnii. River Picton, Johnston.

Corysanthes pruinosa, Rich. Cunningham, in the New South Wales magazine, No. 1; Lindl. gen. and sp. of archid., pl. 393. This is the Tasmanian species, so well figured by the late hon. W. Archer. To Mr. Rob. Fitzgerald, the Deputy Surveyor-General of New South Wales, belongs the credit of having first clearly distinguished C. pruinosa from C. fimbriata in his fine work on Australian orchids. The former species is now also known from Flinders' Island. Whether more than one Corysanthes occurs in Tasmanian territory remains to be ascertained, four occurring in New South Wales. These minute and tender plants, while early flowering in the season, are easily overlooked in the secluded haunt, in which they delight to conceal themselves.

Gastrodia sesamoides, between Circular Head and Arthur's River, F. v. M.; River Picton, Johnston.

Caladenia congesta. Omitted as a species of doubtful value from the census; but the writer had recently an opportunity to examine this plant from the mountains of the Murrumbidgee, where it was collected by Miss Chamberlin; and as the characteristics of the labellum seem not subject to any great alteration, it will probably be best to admit the species.

Patersonia glauca, R. Br., Gould's Country, A. Simson.

Hæmodorum distichophyllum, Huon Plains and Lake Pedder, Johnston.

Blandfordia marginata. Near Arthur's River, Emmett.

Xyris gracilis. Widely dispersed over heathy ground from Circular Head to Arthur River. The three styles are separated to their base, and the anther-cells disjointed by a dilated connective. In this respect the flowers contrast remarkably with those of X. operculata; both species grow much intermixed. In wet places the leaves of X. gracilis are sometimes not developed, and otherwise they are variable in width.

Hewardia Tasmanica. Lake Pedder, Johnston.

Astelia stylosa. Huon Plains, Johnston. A very dwarf variety, unless a distinct species, which question the want of fruits as yet prevents to settle. Scent, that of hyacinths. A. stylosa must be transferred perhaps to Milligania, which only differs in capsular, not baccate fruit, from the genus astelia.

* *Potamogeton praelongus.* South Esk. I have assumed that it is this species of which the late Mr. Sam. Hannaford sent me kindly a specimen but not with ripe fruit.

Xerotes glauca, R. Br. Pontville, W. W. Spicer.

Juncus Brownii. Saline meadows at Circular Head.

Juncus maritimus. Circular Head.

Restio complanatus. Southport, J. E. T. Woods; Honeywood, Blyth: dispersed from Arthur's River to Circular Head, F. v. M.

Lepyrodia paniculata. Frequent on the heaths between Circular head and the Arthur River. In dry localities, dwarf with few flowers in the panicle.

Calostrophus elongatus. In swamps replete with Bauera between Circular Head and the Arthur River.

Centrolepis tenuior, R. and S. Pontville, Mt. Tor., W. W. Spicer.

**Heleocharis acicularis*, R. Br. prodr. 224. South Esk. This plant was already recorded by R. Brown, in his prodromus, as an inhabitant of Tasmania, but under the name of H. pusilla.

Isolepis Gaudichaudiana, Kunth enum. II., 201. In fern tree gullies between Circular Head and the Arthur River.

Scirpus pungens. Macquarie Harbour, Dr. Milligan.

Lepidosperma filiforme. Swanport, Dr. Story; South Esk, C. St.

Lepidosperma Sieberi. Southport and South Esk, C. St.; Swanport, Dr. Story.

Cladium junceum. New Norfolk, Abbott; Southport, C. St.; Swanport, Dr. Story.

**Cladium Radula*, R. Br. prodr., 237. Swanport, Dr. Story; towards Mount Field, East, F. v. M.

Cladium schoenoides. Southport, Dr. Story.

Cladium Gunnii. Evandale and Merser, C. St.

Chætospora tenuissima. Port Sorrell, C. St.; Swanport, Dr. Story; from Arthur's River to Circular Head, F. v. M.

Chætospora axillaris. Southport, C. St.

Chætospora nitens. Swanport, Dr. Story; Southport, C. St.; Circular Head, F. v. M.; King's Island, Neate.

Chætospora capillaris. Bay of Fires, Bissill; Southport, C. St.

Schœnus fluitans. In brackish stagnant pools near Southport; C. St.

Uncinia riparia. Southport, C. St.

Uncinia tenella. Mersey and Southport, C. St.; between Circular Head and the Arthur River in fern tree valleys, not rare, F. v. M.

Carex breviculmis. South Esk, C. St.; Swanport, Dr. Story; Pontville, W. W. Spicer.

* *Carex tereticaulis,* F.M., fragm. phyt. Aust. VIII., 256, at the South Esk and near Perth.

Carex chlorantha. Huon River, Th. Gulliver; on Mount Wellington up to an elevation of 4,000 feet.

Carex Gunniana. Mersey, C. St.

Carex longifolia. Swanport, Dr. Story.

Carex cataractæ. Swanport, Dr. Story.

Spinifex hirsutus. George's Bay, A. Simson; Sandy Bay, W. W. Spicer.

** *Zoysia pungens,* Willd. in Berlin, Verhandlung III., 44 s., King's Island. A small form creeping among Chætospora nitens. Probably overlooked in coast tracts elsewhere.

** *Anthoxanthum odoratum.* Summit of Mount Tor, New Town, W. W. Spicer.

** *Cynodon dactylon.* Hobart Town, W. W. Spicer.

** *Aira caryophyllea.* Mount Tor, W. W. Spicer.

** *Holcus lanatus.* Gould's Country, A. Simson; New Town and Kangaroo Bottom, W. W. Spicer.

** *Briza maxima.* The Domain, Hobart Town, W. W. Spicer. B. minor has become one of the commonest grasses round Hobart Town.

***Bromus mollis* and *B. unioloides.* Neighbourhood of Hobart Town, firmly established, W. W. Spicer.

***Lolium temulentum.* Corn fields, New Town, W. W. Spicer.

***Lepturus filiformis.* Deloraine, J. E. T. Woods; Pontville, on river Derwent, W. W. Spicer.

***Lepturus filiformis,* var. incurvatus. Sandy Bay, roadside, abundant, W. W. Spicer.

***Hordeum murinum.* New Town, abundant, W.W. Spicer.

Festuca distichophylla. Circular Head.

** *Festuca ovina.* Mt. Tor, W. W. Spicer.

Festuca syrtica. Saline flats at Circular Head.

Hierochloa rariflora. Bay of Fires, Bissill ; St. Paul's River, C. St. ; Swanport, Dr. Story ; Gould's Country, A. Simson.

Stipa teretifolia, Steud. glum. I., 128. Swanport, Dr. Story ; Tamar and Southport, C. St.

Stipa crinita, Gaudich., Bot. Voy. Freycin., 407, or an allied species occurs on King's Island.

Grammitis leptophylla. Cataract at Launceston, Johnston.

Lomaria vulcanica. Waterfalls on Mount Wellington, Oldfield ; Mount Laperouse, C. St. ; North West Bay, W. W. Spicer.

Lomaria fluviatilis. Gould's Country, A. Simson.

Pteris comans. Along Arthur's River and in its vicinity.

Todea Africana. Port Davey, Hon. J. R. Scott ; Gould's Country, A. Simson.

Asplenium umbrosum. Gould's Country, A. Simson.

Cyathea medullaris. Between Circular Head and Arthur's River, about eight miles inland. Mr. S. B. Emmett, the discoverer of this noble tree fern in this particular locality, measured stems fully 40 feet long, but always found them remarkably slender. Mr. Stephens recorded this fern in the Royal Society's Publication, 1872, p. 25.

Alsophila Australis. Gould's Country, A. Simson.

**Alsophila excelsa.* R. Br., prodr. 158. Var. Cooperi. Base of Adamson's Peak, near Port Esperance, Hon. J. R. Scott. To this reference has been made in the volume of the Royal Society of 1872, p. 50.

Schizœa bifida. The authority given usually for this fern, and also in my census, is not the oldest. Swartz defined the species already in Schrader's Journal for 1800, vol. II., page 7. as shown by Pritzel, Icon. bot. index, 999, and Pfeiffer Nom. bot. II., 1077. Perhaps, however, Sir James Smith already had this species, with others in view when he established the genus in 1791. Mem. Acad. Turin, V. 419, t. 19, f. 9.

Schizœa fistulosa. Between Circular Head and the River Arthur.

Dawsonia superba. Between Circular Head and Arthur River.

Cyttaria Gunnii. On the beech trees between Circular Head and Arthur River. From this locality specimens were obtained for Baron von Thümen's Mycotheca.

ALGÆ

(All from Mrs. Meredith's collection formed at Orford).

*Sargassum Sonderi, J. Ag.
Nereia australis, Harv. in J. Hook. fl. Tasm. II., 289.
Halyseris Muelleri, Sond.
Dictyota paniculata, J. Ag. symb., p. 5.
*Dictyota nigricans, J. Ag.
Liebmannia australis, Harv. in J. Hook. fl. Tasm., 291.
*Liebmannia ramulosa, J. Ag.
*Thamnoclonium echinatum.
Lenormandia marginata, Harv. Ner. Austr., 19.
Pollexfenia pedicellata, Harv. in Hook. Lond. Journ. III., 431.
Dictymenia Harveyana, Sond. in Linnaea XXV., 697.
**Chondropsis Harveyana, J. Ag.
Chondria dasyphylla, Ag. sp. alg. I., 350.
Chondria opuntioides, Harv. in J. Hook, fl., Tasm. II., 297.
*Chondria clavata.
Rhytiphlæa australis, Endl. gen. suppl. III., 48.
Polysiphonia Hookeri, Harv. Ner. Austr., 40.
Polysiphonia Hystrix, J. H. and Harv. Ner. Austr., 41.
Dasya Gunniana, Harv. Ner. Austr., 59.
Dasya hapalathrix, Harv. phycol. Austr., 88.
*Dasya elongata.
*Dasya ceramoides.
Delissa pulchra, Mont.
Delissa elegans, Mont.
Laurencia Tasmanica, J. H. and Harv. Ner. Austr., 84.
*Laurencia thyrsoidea.
Wrangelia nobilis, J. H. and Harv. in Lond. Journ. III., 411.
*Wrangelia ballioides, J. Ag.
Wrangelia setigera, Harv. in Hook. fl. Tasm. II., 309.
**Rhodoglossum latissimum, J. Ag.
Rhodophyllis Gunnii, Harv. in J. Hook. fl. Nov. Zel. II., 247.
Rhodophyllis membranacea, Harv., l.c., 247.
Rhodymenia foliifera, Harv.

Areschongia Laurencia, Harv. in trans. Roy. Ir. Acad. XXII., p, 554.

*Areschongia australis, Harv.

Rhabdonia nigrescens, J. H. and Harv. in Lond. Journ., VI., 409.

Gloiosaccion Brownii, Harv. phyc. austr. t. 83.

Mychodea membranacea, J. H. and Harv. in Lond. Journ., VI., 408.

**Corynocladia umbellata, J. Ag.

Polycœlia fastigiata, Harv. in J. Hook. fl. Tasm. II., 324.

Callophyllis coccinea, Harv. in Lond. Journ., VI., 405.

*Callophyllis Harveyana, J. Ag.

Kallymenia Tasmanica, Harv. in J. Hook. fl. Tasm. II., 325.

*Kallymenia polycœlioides, J. Ag.

Gigartina brachiata, Harv. in J. Hook. fl. Tasm. II., 325.

*Epymenia halymenoides, J. Ag.

*Chrysymenia Meredithiana, J. Ag.

Centroceras clavulatum, Mont., fl. Alg., 140.

Ceramium diaphanum, Roth.

*Thamnocarpus Harveyanus, J. Ag.

Griffithia Sonderiana, J. Ag.

**Bornetia Meredithae, J. Ag.

Caulerpa Harveyi, F. v. M. in Harv. phyc. Austr. ,95.

Caulerpa scalpelliformis, Ag. sp. Alg., I., 437.

ON SOME TASMANIAN PATELLIDÆ.

By the Rev. J. E. Tenison Woods, F.L.S., F.G.S.

[*Read 9th May*, 1876.]

Our knowledge of Australian mollusca is almost confined to descriptions from the shells alone. Nearly all that we do know of the animals inhabiting the shells has been given to us by Messrs. Quoy and Gaimard in the voyage of the Astrolabe, where the plates as far as they go, leave but little to be desired. In the Nudibranchiate section Mr. G. F. Angas, F.L.S., etc., has done good service. But the greater part of the field remains untrodden. I propose in this paper to give a more detailed account than has yet appeared of the shells and animals of some Tasmanian Patellidæ. I choose this family because it is the one in which a knowledge of the animal is most required to arrive at correct principles of classification. Limpets cannot be determined from the shell alone. The genera are classed according to the respiratory organs of the animal. These can only be told by a study of the habits of the animal, and by dissection. To both of these methods I have given lately some attention, and a part of my conclusions are embodied in the present paper.

Before giving a glance at the character of the genera, let me state the principles which have guided me in the nomenclature. Conchology has recently increased its synonyms with a rapidity which is perfectly appalling. No naturalist can deprecate too strongly the practice of lightly changing a received name. It is embarrassing, nay, disheartening to students, and destructive of progress in science. This is not the place to enter into the causes of the evil, but it is in part due to a misunderstanding of the labours of Dr. Hermannsen, Chenu, and others, as embodied in the Manual of Conchyliologie. I shall adhere strictly to the British Association rules, and notably not to admit "priority" for *pre-Linnean* names, nor for those where no definition or figure has been given; and, even in the cases not thus exempted, not to change the name if it be generally received and known among naturalists.

For those reasons I shall adhere to Eschscholtz's genus of *Acmæa* instead of *Tectura*. First, because Messrs. Auduoin and Milne Edwards gave no definition of their genus, and secondly, because Acmæa is the name by which it is described in the works of Professors Forbes, Hanley, Woodward, Chenu, Carpenter, and the earlier writings of Mr. Angas.

Limpets, or bonnet shells (*Patellidæ* from *Patella*, Latin for a little dish) are classified according to the respiratory organs of the animals which inhabit them. This is true at least for the only genera known in Australia.

The true limpets—PATELLA—have the gills disposed in a circle round the mantle, in the space between it and the foot. On detaching a limpet from the rock and placing it upon its back in the water the mantle will be seen to spread out, disclosing the feathery filaments of the gills like a fringe round the upper part and below the silvery muscular attachments. Within this circle is the broad foot attached all round in its upper part by the silvery muscles aforesaid, except an open clear space for the free movement of the head, having a rather large chamber behind in which is the excretory orifice. The mantle is, however, continued round the shell in front of the head, and in one of the Tasmanian true limpets so are the gills.

But in some limpets there are no gills round the mantle. In this case, in one genus, they are placed at the back of the head, and can be seen as a long feathery plume, coming forth from the head chamber. This is the second genus *Acmæa*, I do not know of any difference by which the shells of the genus may be distinguished. True limpets are sometimes nacreous, *Acmæa*, are never so. We have only two species of true limpets in Tasmania certainly ascertained, while we have many of *Acmæa*. There are, of course, other limpets described, but the animals have not been examined, and until they are the shells must be considered as only provisionally classed.

Besides the above arrangement of the gills we have limpets which have no gills at all, but breath by a true lung. These are the Siphonariæ. Their anatomy is not well understood, but what little is known removes them in their whole organisation very far in the animal rank from true limpets. As I have had facilities for the examination of two of the species, I have preferred to place my observations in this paper; they are not Patellidæ, however. Their shells are only in some slight details to be distinguished from limpets, which shows us how little a shell of such simple character can be a guide to the knowledge of the animal it shelters.

In addition to the breathing apparatus we have in all mollusca a very valuable organ as a means of identification, if not of true classification. That is the lingual ribbon. It is a long horny membrane, studded with minute points or teeth of a very hard siliceous nature, sometimes vitreous and transparent, but in all the limpets of a rich golden or dark brown color. By some writers this organ is called a tongue, by others teeth, radula, &c. For convenience I shall adopt a name proposed by many naturalists, viz., *odontophore*. Its nature and office are not thoroughly understood. I here record my observations in the case of the Tasmanian limpets. All of these animals have strong cartilagenous jaws curved and swollen on the upper side. Between these the odontophore is placed, and has, in this part alone, a wide transparent membranaceous expansion. From the under side and back of both jaws two muscles proceed and meet on the under side of the ribbon, and continue to its point, which is tongue-shaped, and with a gradually diminishing number of teeth. These muscles I call the retractors. There are also two extensor muscles proceeding from the point of the jaws and meeting under the odontophore, about half way down the membranaceous expansion, and continuing to its inner end. The membranaceous expansion itself appeared to have free movement and not to be attached in any way. Now,on turning a limpet on its back in the water and watching its mouth with a lens, the ribbon is seen to be in constant movement. First there is the outer lip of the mouth with cirrhi and notched below. Secondly, a mouth opening vertically. Within this the odontophore is seen to be constantly moving, being drawn back over the curved cartilaginous jaws like a strap, and when drawn back the mouth would close. It seemed also as if it was pushed in between and not over the jaws in returning to its place. The whole operation was much like the action of a strap drawn over a drum wheel.

The action of the odontophore, however, does not rest here. It is not only a rasp for tearing away from sea weeds, etc., the necessary portions, but it lines the whole of the œsophagous, and is continued along a considerable portion of the intestinal tube. Its length is consequently very much more than the length of the shell. In *Patella limbata* the length is enormous, being ten to eleven inches; while the longest diameter of the shell is seldom over two. Some naturalists have imagined that the length depends upon the age. I have not found it so. The proportionate length is generally the same in young as in old animals. The distal end of the ribbon is soft, and with rudimentary transparent teeth. This may have led to the idea that the odontophore was constantly being added to. It seems to me,however, that the rudimentary teeth were of a different characterand structure fromthose of the rest of the ribbon, and serve some other purpose. All the teeth are hooked backwards,so that by the movement of the odontophore the fragments of sea-weed are torn off, and continually by the same action forced down the œsophagous, and literally shredded as they pass over the innumerable fine points. Properly speaking this process combines the office of mastication and digestion, teeth, gizzard, and stomach all in one, and as far as my examinations have gone there is really no stomach, that is to say, a cavity where food is specially reserved for assimilation. There is a dilatation of the intestinal tube scarcely perceptible in some, as in *Patella limbata*, Phil., a kind of plexus where the odontophore is very much twisted and convoluted, so as scarcely to be drawn out without breaking, but this I imagine serves some purposes of digestion, very different from the action of what we usually call a stomach. These, however, are matters of my own opinion only, which I have not been able to bring to the test of any physiological experiment.

The odontophore is easily drawn out of all gasteropods examined by me, except the species just mentioned. In Patellæ and Littorinidæ (winkles) it is always long. In our Risellas and Littorinas it is of enormous length, but lies, in this case, in a simple coil immediately behind the mouth as a silky siliceous thread. In Chitons it is a closed tube with teeth all round it as in *Haliotis nævosa.*

Professor Forbes *(Brit. Moll.)* has remarked that the character of the teeth and their arrangement is very constant in the various genera. I have found that it varies also for the species in Tasmania, at least in the order I am now dealing with, and I hold it to be a very valuable test as to specific difference. Indeed it is a test where all others failed, because shells are often so corroded as to obliterate marks on which specific differences are chiefly erected. This is exclusively the field of the microscopist, but I am convinced, not only that it is a wide and valuable field for investigation, but that until it is carefully explored we shall have no solid system of conchology resting upon a secure scientific basis. The teeth in all the *Patellæ* and *Acmeæ* have raised double edges or points which curve, succeeded again by a smaller double edge or point. Thus each set is curved back from its attachment to the odontophore at its lower side. As far as my investigations have gone there is a general correspondence between the pattern of the odontophore and the organs of respiration. In Patellæ it is of one type, and Acmeæ of another, though the resemblance is very close. In Siphonaria, however, which is pulmoniferous, we shall see in the course of this paper that it has a dentition quite uniform with the land and freshwater mollusca. This can hardly be called an anomaly, though it points out a singular fact rather adverse in my mind to the theory of natural selection. Here we have a marine animal with a shell differing but slightly from the commonest of our marine types and apparently living under the same conditions, yet organised to breathe air and salt water, and with a dentition exactly similar to pulmoniferous mollusca living under totally different conditions. Of course a double inference may be drawn from this as from similar facts, but they point in my mind much in the stronger way to an origin in an infinitely varied creative power, showing by its strange and complex variety that evidently no conditions organisations, nor combinations were an impossibility. Scientific observations as they are extended seem to show rather the absence of law than the existence of it, or rather, as I should phrase it, an infinitely creative power and inexhaustible mind.*

If I were to pursue the argument further I should reason thus: In the theory of natural selection we ought to perceive a certain congruity between organisations and the circumstances of their existence. This is no more than what was formerly used as an argument of design. Thus in the case of limpets with conical shells of simple structure, breathing by gills, and living sometimes in and sometimes out of salt water, digesting sea weed by means of a certain pattern of odontophore, we see conditions of life well balanced, as we interpret them, to meet their requirements. In the land and freshwater mollusca we meet with more complex shells, breathing by lungs, and odontophore adapted to the food and the other conditions, and in this case also we may find very close relations between the conditions of life and the organisation. But all our inferences are set at naught, upon meeting a limpet with every habit and condition of life that is shared by its marine relations, but with lungs and an organisation exactly like land and fresh water mollusca. It will be urged that such instances are destructive equally of the argument of design. But this I readily admit, and I must say that one service which the theory of natural selection has rendered is in destroying this argument by showing that it can be read backwards. It is a contradiction of infinite power to suppose it to be tied to certain means to attain an end. The truth lies the other way, as such instances as the anomalous Siphonaria (the pulmoniferous marine mollusca referred to) show us. What makes the anomaly still more striking is that the genus is confined to the eastern hemisphere. Three species supposed to be of that genus are found in the Miocene of Europe,

* The following very apposite passage from Butler's Analogy is worth recalling:—"The thing objected against this scheme" (he is speaking of the Gospel) "is that it seems to suppose God was reduced to the necessity of a long series of intricate means in order to accomplish His ends. . . . . . . As men, for want of understanding, or power, not being able to come at their ends, directly, are forced to go roundabout ways, and make use of many perplexed contrivances to arrive at them. Now everything which we see shows the folly of this. . . . . For, according to our manner of conception, God makes use of a variety of means. . . . for the accomplishment of His ends. Indeed, it is certain, there is somewhat in this matter quite beyond our comprehension, but *the mystery is as great in nature* as in Christianity."—Butler's Analogy, part 2, chap. 4. The italics are my own.

through an identification from the shell alone must at best be doubtful.

I will now proceed to a description of the species examined by me.

Patella limbata. *Philippi Abbild. und Besch Conch. pl.* 3 *fig.* 1 (as from North Australia).

Shell large, ovate or suborbicular, somewhat depressed, ribbed, dusky brown, with the intercostal spaces darker, apex anterior, rounded, nearly always much corroded, and slightly nacreous ; ribs broad, rounded, thickly, often coarsely grooved with lines of growth ; intercostal spaces concave, often containing smaller round ribs which do not reach the apex, the number apparently increasing with age ; interior broadly margined with large pattern of alternate rich claret and brown, the claret marks intercostal, and may be traced some distance up the shell ; within the margin interior of shell of a peculiar silky nacre, silvery, bluish yellow or golden ; spatula well defined, bluish grey, slightly darker at the margin, with broad concretionary line outside for the muscular attachment, which is often coloured yellow. Held up against the light the shell shows beautiful double claret-coloured rays, which become smaller and interrupted by age, marking the intercostal spaces. As the dimensions vary I give the measurements of a few specimens, all taken from the rocks at Southport. Long. 62, * Lat 53, alt. 24, ribs 37, (old but not corroded) ; Long. 59, Lat. 47, alt. 27, ribs 37 ; Long. 71, Lat. 64, alt. 32, ribs 36 ; Lon. 54, Lat. 47, alt. 23, ribs 29, Long. 71, Lat. 61, alt. 28, ribs 37 ; Long. 67, Lat. 37, alt. 35, ribs 33. Thus the relative dimensions and number of ribs vary. The species is always found high above low water mark. It attains its largest dimensions in Tasmania, but is the commonest limpet of all the south coast of Australia.

Animal olive green, above base of foot bluish brown, mantle very pale yellowish green, fringed with numerous short olive or speckled tentacles, every fourth one of which is longer, head and muzzle olive green above, flesh-coloured elsewhere ; tentacles of head somewhat long and tapering, and dark olive above ; eyes scarcely perceptible at their outer base; gills pale, translucent, and narrow, fringing the mantle all round except at the excretory orifice above the head, no attachment to head or neck, and not apparently passing into the head chamber ; muscles of attachment silvery and conspicuous within the gills. Odontophore very long from (8 to 10 inches), and curled in the upper cavity of the foot in large irregular folds, consisting of a series of pairs of long curved sharply pointed teeth, closely set, and of dark colour, with a small trian-

* All measurements in millimetres.

gular golden translucent cusp on the outer base. The whole odontophore enveloped in a fine golden yellow transparent membrane, which is either the intestinal tube or its lining. The odontophore never can be drawn from the animal without this membrane, owing to the long set pointed teeth which hold it in its place.

PATELLA USTULATA. *Reeve Icon. pl.* 31, *fig.* 88. If I am right in my identification of this shell it must be the same as my *P. tasmanica*, described in last year's proceedings of this Society. Reeve gives no habitat for his shell, which from appearance was worn and corroded. The unworn specimens found living on the rocks are as different as possible, the ribs and riblets being then conspicuous, and the whole shell a dull yellowish white with no trace of the scorched colouring. When dead, however, and thrown on the beach this feature is conspicuous. It has many fine riblets between the coarse somewhat nodular ribs, and the margin is very finely pectinated. A peculiarity of the animal is that it seldom comes above low water mark, and prefers situations where it is much exposed to the waves. It is very stationary, often being sunk into a regular pit in the rock, and appears to live upon the fine green ulva on the rocks. It is nearly always covered, not only with confervoid growths, but also nulliporæ so as to quite alter its shape and appearance. This often alters the height of the shell, which is usually depressed, and changes the position of the apex, which is usually submarginal. The interior is white and the spatula not defined.

The animal is of uniform pale yellow at the base; white above the foot, gills semi-pellucid and continued as a delicate fringe *all round* the mantle. I, however, noticed one exception where, like the former species, the gills were discontinued in front of the head, mantle without tentacles; head livid, with semi-pellucid tentacles; eyes very small and at exterior base; buccal mass red and fleshy; cartilaginous jaws long and less tumid than most limpets; odontophore *scarcely as long as shell;* not coiled, but bending with intestine in two folds. Teeth closely set and not high, composed of five central small curved cusps, and two tri-lobed laterals, all narrowly tongue-shaped, laterals more acute. The five centrals have the middle tooth often small. Teeth brown, lighter on the summit.

There are many other Patella known to us from the shells alone, the animals of which I have not examined, viz., *P. decora*, *P. aculeata*, *P. chapmani*, *P. radians*. Some of these will doubtless prove to be Acmæa.

GENUS 2.—ACMÆA.

Animal with a limpet shell, but breathing by a plume-like gill inserted at the back of the head.

Acmæa costata. *Sowerby Zool. Voy. Beag.*, as Patella, Probably also *P. alticostata*, *Angas. Proc. Zool. Soc.* 1865, p. 56, pl. 2 fig. 11. This shell has always been set down as a Patella, but the animal shows it to belong to the above genus. The shell is oval or elliptic, depressed and somewhat tumid, apex submedian with from 12 to 30 coarse-rounded rough uneven ribs, irregularly marked with lines of growth which makes them almost nodular. Interstices concave, transversely barred at intervals with black or brown lines, which are the remains of successive marginal marks; they are seldom regular, appearing at intervals and frequently corroded away; interior porcellanous, white or faintly bluish white, irregularly stained pale brown, shining; margin undulating, with a well-defined narrow brown edge, which is spotted deeper brown or black at the intervals between the ribs; spatula generally well defined, reddish brown, paler in the centre. Size varying, but generally 30 to 40 mill., and the proportions of length, breadth, and height being as 10, 8, and 4.

Animal a dull yellow below, blending into brown at the base of the foot, tentacles fine and short, with eyes at the external base; gill plume long, flat and lanceolate, flexuously extended over the head; muzzle yellow, and notched below; inner lip cartilaginous and transparent, with a shelly appendage coming down from above horizontally across the tongue and apparently holding the food against the rasp; jaws cartilaginous, crescentic, but pointed and attached; very massive red muscles; odontophore one and a half the length of shell, with broad membranaceous expansion at mouth; teeth in pairs, alternating large and small, the small ones close together and somewhat narrow; the larger with a broadly semi-circular edge and a small lateral cusp on the outer side.

This Acmæa is equally common in South Australia and Tasmania. It exists between the tidal marks, and is of such a large size that it was never suspected to be other than a Patella. Yet in Australia the Acmæa genus has species quite as large as Patella, though this I think is a new fact in zoology. They feed on ulva, and are considered better eating than true limpets, though these shellfish are seldom eaten in Australia.

Acmæa septiformis. *Quoy and Gaimard*, *Voy. de l' Astrolabe*, pl. 71, f. 43, 44. *A. scabvilirata*, Angas, Zool. Proc. 1865, p. 154, *Tectura septiformis*, Cox Exchange list: Sydney, 1867. *Patella cantharus*, Reeve (probably) pl. 4, f. 131.

This shell varies so much in colouring and the fine markings that I am afraid it has received a longer list of synonyms than I can enumerate. The shape of the shell is, however, constant. It is small, broadly ovate, depressed, apex acute, submarginal; in young well preserved specimens, ornamented with fine distinct liræ faintly decussated with lines of growth; edge entire, sometimes transparent; colour olive with greenish gray spots; deep olive approaching black; greenish gray with network of brown; yellowish, marked with zigzag lines of brown, pale transparent tortoise-shell, or, rarely, beautifully and regularly rayed with broad lines of brown on a pale green ground. Interior with a transparent or dark olive margin, rather evenly circumscribed by a bluish white porcellanous enamel, which is opaque, opalescent or translucent, showing external pattern, spatula imperfectly defined in various shades of brown and often absent. Average dimensions, Long. 14, Lat. $11\frac{1}{2}$, alt. $4\frac{1}{2}$.

Animal very pale yellow, base of foot sometimes a little darker; mantle translucent, muscular attachment silvery; gill plume long, coarse, and conspicuous; head somewhat large and livid; tentacles pale purple brown, rather long and fine pointed; eyes conspicuous at external base, and somewhat on upper side; buccal mass red and fleshy; jaws stout, translucent cartilaginous; odontophore about a fourth longer than the shell, composed of pairs of broadly lanceolate recurved teeth, concave on the inner side and convex on the recurved side. The pairs of teeth are alternately large and small, the larger pairs having a broad short cusp on the outer side.

This species often so closely resembles *A. testudinalis*, *Müll.* that I was inclined to believe it is the same, but the teeth are slightly different. That shell is found in *N.-East* America, in all the circumpolar seas, and in Japan, from 4 to 48 fathoms. Professor Forbes *(Brit. Moll.)* says that the eyes are always at the *internal* base of the tentacles; this peculiarity I have met in some specimens but rarely. Common everywhere in pools, under stones.

ACMÆA FLAMMEA. *Guoy and Gaim. Voy. de l' Astrol. Vol.* 3, *p.* 354, *pl.* 71, *fig.* 15-24, as Patelloida. Shell oblong, *elliptic, convex and turgidly conical*, apex anterior acute and moderately inclined, *shell somewhat solid*, with obsolete radiating striæ, which, however, are seldom visible; lines of growth numerous and conspicuous; of varied colour, but generally marbled olive, fuscous brown and dingy yellow, reticulated or in straight or forked lines; interior margin acute and rayed or reticulated a deeper brown than exteriorly; spatula brownish, badly defined and interrupted, circumscribed by a ring of faint translucent enamel marking the muscular attachment.

Animal creamy white, base of foot dingy yellow; head small, tentacles short and swollen, eyes at base *above*, branchial plume *very inconspicuous*, odontophore *scarcely length of shell.* Unfortunately I have mislaid the specimens I reserved of this animal before submitting them to microscopical examination.

MM. Quoy and Gaimard say the animal is also found at Guam Island.

I have much doubt on my own mind if this species is not identical with *A. subundulata*, Angas. Zool. Proc. 1865, p. 155. I have marked in italics the difference between this species and the preceding. Its habits are different, as it is found generally out of water on rocks. Not common at Southport, where alone I found it. Mr. Angas found it at Port Lincoln, South Australia; and Mr. Archer found it in Hobson's Bay, Victoria. Mr. Angas says (*Zool. Proc.* 1867) that the worn specimens of this shell are prettily marked with a cross. I have not found it so, but I have found it the case with the worn specimens of the young of a new and large species of Acmæa, which I shall now describe for the first time.

Acmæa crucis. *n.s. A.t. ovata, postice latiuscula, alta, conica apice acuto, ante mediano, sordida, sæpe corrosa, absque liris radiantibus; striis tamen incrementi irregularibus (sub lente confertissimis); margine acuto, integro, intus linea fusca constricta exacté fimbriato; aliquando rufo fusca tesselato; intus alba nitida, encausta, irregulariter rugosa; spatula eleganter lineis undulosis rufo-fuscis margine, concentrice definita et lineis radiantibus decussata, intus cæruleo-albo nebuloso.* Long. 31, Lat. 31, alt. 19 mil.

Shell ovate, broader behind, very high, conical; apex acute antemedian, sordid white, often corroded *without any radiating ribs*, but irregularly and finely concentrically sulcate with lines of growth; margin acute, entire, ovate, fringed with a well defined brown line which is often tesselated with red brown, above this line, the interior is white and highly enamelled; spatula well defined by undulating concentric rich red brown lines, and crossed with radiating lines; in the centre the spatula is clouded with pale or opalescent blue.

When this shell is cast upon the beech it is quite of a different appearance. The apex has radiating brown lines generally in the form of a Maltese cross. The rest of the shell is white and the margin worn away. There is a limpet with a cross upon the apex figured in *Wood's Index Testa.*, p. 189, sp. 78, and named *Patella cruciata*, with the following references, which I have not been able to verify. *Acmæa Lin. Sys. M. U.* Schr. Em. ii. 432, pl. 5, f. 6.—A. c. Han. Ips. Lin. 429. Locality unknown. This limpet, however, has a *white* cross on a brown ground. In the Proceedings of the Linnean Society, 1859, Mr. S. Hanley, on the Linnean MS. in the Museum Ulricæ, has this extract "*P. cruciata, P. ovalis convexa, integerrima, cruce picta.*" The name *cruciatus* (tormented) is evidently a grammatical mistake.

Animal, bluecish black round the base of the foot and head; muzzle and mantle, pale creamy white; muscles of jaw, red; jaws, cartilaginous, semi-lunar, pellucid, swollen; head, purple above, livid below; tentacles, short, swollen; eyes, small, and at outer base; mouth, with cirrhi, and opening lengthwise; gill plume, fine pointed and long, white; odontophore transparent, divided into small squares, each sustaining two pairs of broadly round edged minute curved teeth, opaque, pale, and with a fine dark edge; one pair close together in the centre of the odontophore, the other pair wide apart and with a fine lateral cusp on the outer side.

ACMÆA MARMORATA *(mihi. Vide Proceed. R.S. Tasm.,* 1875., *Diagnosis auct.)* Shell small, ribbed irregularly elliptic, depressed, generally much corroded, dirty yellowish brown, often stained, and mis-shapen; apex when not corroded somewhat elevated and anterior, but more often quite obliterated; ribs, from eight to ten, rugged and often much distorted with lines of growth, projecting conspicuously beyond the periphery; interior edge undulating, deep fuscous brown, lines of ribs concave and white, giving the interior a rayed appearance; spatula black, irregularly margined, with opaque white, more or less black spotted. Dimensions of five rather large specimens, Long. 19, Lat. 17, alt. 5; Long. 20, Lat. 16, alt. 7; Lon. 19, Lat. 12, alt. 5; Long. 18, Lat. 16, alt. 9; Long. 17, Lat. 17, alt. 8. The variation in the relative dimensions will show the extreme variation in shape to which the species is subject.

The mantle of the animal is of pale transparent neutral tint, showing veins very clearly and sufficiently translucent to show the pattern of the shell underneath. The edge of the foot is yellow with the upper part and base darker neutral tint; upper part of head lemon yellow, with fine, somewhat long, and translucent tentacles, with eyes on external base on a swollen tubercle; outer lips with coarse cirrhi; inner lips opening perpendicularly and displaying a lanceolate unarmed tongue, with a rachis (odontophore) at its base; gill plume small, translucent, and seldom exserted beyond the head. The animal is found above low water mark in crevices, etc., at Southport, and generally throughout Tasmania; odontophore about one and a half length of shell; teeth in pairs, and recurved, broad, and rounded into a semicircular edge, first pair largest and somewhat oblique, and with a small cusp at each side on the outer edge; central pair, small, narrow and close together; roots curved. The larger pairs have a curve in both directions, and not unlike the upper part of a lady's tortoiseshell comb.

The species that I am about to notice are included under quite another family from Patellidæ. At present Molluscan science has not arrived at sufficient accuracy to make any system of families of much value, especially as naturalists are so divided on the subject, and none are generally received. I include the genus Siphonaria in my observations, only because they have limpet shells, and their habits of life being entirely similar they are generally mistaken for true Patellidæ. They are widely distinct in their anatomy, organs of respiration, digestion, dentition, vision, touch, etc. But they are found on our rocks just as limpets are, and in the midst of them and externally cannot be distinguished from them. They are very common. Two species have been examined by me, and a third is said to occur, but I have not been able to find it. Four or five are known in Australia, but the number is not very clearly ascertained, nor will it be until the animals have received more attention than they have met with from Australian naturalists.

Siphonaria denticulata. *Q. and G., Voy. Astrol., Vol.* 2, *p.* 340, *pl.* 25, *f.* 19 *and* 20, *var. Tasmanica, mihi.*

Shell, irregularly oval, with protuberance on the siphonal side, tumidly conical, high, apex median, subacute; with 40 to 50 fine, flattened and diminishing ribs; ribs interrupted by a sinus at the siphonal side; color, bluish white, apical area brown or olive, lines of growth olive, giving the shell a zoned appearance, but varying in every individual shell; often stained an uniform bluish black or much corroded; interior rich purple brown, highly enamelled; edge crenulate, spatula brownish white, extending partly down siphonal sinus.

Animal, dull brown, with numerous small light spots of varying size; foot yellowish, shading to orange near the head; mantle, brown, fringed at the edge with whitish and black spots. When the mantle is irritated the black spots seem to be the points where it is drawn in. Head, a large and many lobed mass, forming a cup-like expansion round the very small mouth; no eyes visible, and though they are represented in Messrs. Quoy and Gaimard's figures of *S. diemenensis*, I have never been able to detect anything, but a single black dot of varying position on one of the lobes of the head. Above the foot on the left side of the animal is a lobe which forms a kind of semicircular tube, closely pressed to the shell, and here the mantle is not visible. This tube is the siphon, and is lobed so as to be capable of a kind of bipartition which probably divides the orifice into an excretory as well as respiratory duct. This lobe of the foot acts as a kind of operculum, closing the orifice when necessary. My belief is that the animal breathes both air and water. If placed in the open air the siphon tube opens at once, and the tube is always open when the animal is taken from the rocks which it inhabits, and which are not long covered by the tide. On placing weak carbonate of ammonia about an inch from the orifice the animal emitted bubbles of air and showed signs of distress by movement and by pouring forth water from the mantle. On immersing in water animals long exposed to the air many bubbles of air rapidly escape, and then the siphon became tranquil and full of water. In this state the animal continued many days. Magenta dropped into the water gradually spread out and was drawn imperceptibly into long threads of currents towards the siphon. Magenta dropped into the siphon was not emitted for a long time, and then thoroughly diluted and in fine streaks. All these facts tend to show that respiration is accomplished by no muscular movements, but by the ciliated surface, of the simple sac of which the lung is composed.

In the circumstance of breathing air and water the animal has this peculiarity in common with all our fresh water mollusca. I am not aware that this has been ascertained of our Siphonariæ, and certainly it was not known that its anatomy corresponds in every respect with the fresh water pulmonifera. The lingual ribbon of this and the following species I find to be in keeping with its pulmoniferous character. Mr. Woodward in his Manual (p. 286, 2 edit.) says, "The inoperculated air-breathers, without known exception, have rows of similar teeth with broad bases resembling tesselated pavement, whose crowns are recurved, and either aculeate or dentated." I may quote also on this subject the observations of W. Thomson (Annals Nat. Hist., 1851, p. 86). He says, "The tongue of the Pulmonobranchiata generally is a thin expansible membrane, two-thirds or three-fourths of which is rolled into a tube; the posterior end of this tube is closed, while at its anterior extremity the remaining portion of the membrane is expanded into a flattened or spoon shaped form which plays against the edge of the horny upper jaw, thus acting more as an under jaw than a tongue. It is enclosed in the muscular head and connected with the œsophagus at the anterior end of the tube, the extended upper portion of the œsophagus forming the roof of the mouth, while the expanded surface of the tongue covers the lower part of the mouth. From the junction of the œsophagus and tongue the former passes backward and leaves the head at the upper part, while the latter takes at once a downward and backward direction, and protrudes its closed end at the lower part of the head. The tongue when laid open is of the same width throughout. It is covered with a vast number of plates with tubercles which are curved backwards. The plates are in rows which are straight in the antero-postero diameter, but variously curved or angular transversely. The number of teeth is not constant in individuals, but is so within certain limits for the same species. The central tooth or plate is symmetrical and the lateral diverge from it in form as they are distant from it." They do this according to a certain rule, which is, "By the *suppression* of the prominences on the *inner side* of each lateral tubercle, and by the *increase* of the corresponding parts on the outer side." Again, "a gradual curve in the transverse line causes a gradual change in the form of the teeth; great angularity causes a sudden change: and the degree of duration from a straight line is the measure of the difference between the central and lateral teeth."

These valuable observations give the key to the form of the teeth in Siphonaria, though subject to considerable modifications. In a figure after Wilton in Woodward (*loc. cit. p.* 305) the teeth of a Cape Siphonaria is given *(S. venosa?)* where the teeth are not in plates but linear, hooked, the *plate* or tubercle being both oblique, but the plate sloping from the centre, and the hooked tubercle towards it, with about 40 on each side, the transverse line curved upwards.

In *S. denticulata*, the buccal mass is red and fleshy, in which two long, thin, rather broad cartilaginous jaws are imbedded. Amid these the broad ribbon is spread, working almost perpendicularly, with a very slight movement backwards, as far as I could ascertain in the few opportunities which the shy and sluggish animal gave me of observing. The œsophagus is a bright orange yellow, and terminates at the distance of about 20 mil. in a sac of the same colour. The odontophore soon becomes a tube enclosed in membrane. It does not follow the œsophagus, but curls round and projects as a closed hyaline tube outside the buccal mass. When the animal is wounded it admits a viscid milky blood (?) of quite a different character from other gasteropods.

The odontophore with careful manipulation may be easily extracted and spread out. It is very difficult to clean it from the attached membranes, but when spread is about 8 mil. long by 3 broad. It is a series of curved lines of teeth diminishing in size from the centre to the margin. The teeth have a broad crescentic edge, which increases in width downwards and is fixed upon the membrane. The teeth gradually diminish outwardly to a mere faint line of curved tubercles. The appearance of the whole is more like a series of combs with long curved teeth. There appears to be, properly speaking, no plate from which each tooth projects, and the central tooth from which each row diverges in a curved line, is rudimentary.

Siphonaria diemenensis. *Quoy and Gaim. Loc. cit.*, vol. 2, p. 327, pl. 25., fig. 1 to 12. Shell oval, convex somewhat high, apex acute, median, with numerous small, conspicuous ash grey, rounded, radiating, slightly rugose ribs, about 40 in number, interstices dark brown, concave, with smaller ribs occasionally, which reach half up the shell. Margin acute and finely undulating Interior regularly marked with dark brown and white lines, the latter concave and corresponding with the ribs, the brown marks becoming broader towards the edge and often bifurcating, spatula badly defined and clouded reddish brown, siphon not always defined

The animal is a citron yellow beneath; above dusky, speckled with yellow. The head is separated from the foot by a deep transverse fissure. The base of the head is pale neutral tint. When the mouth is closed it appears as a reddish brown spot. The lower lip is yellowish, and when closed is like a longitudinal fissure. As it opens it becomes crescentic. The upper lip is then seen. It is arched; fine reddish brown above, with yellow cirrhi below. The odontophore is protruded from this, and moves up and down with an ordinary licking movement. The appearance it presents is that of the finger of a glove with the end pushed in upon itself, and the crowded edges of the tube thus formed brought together by the drawing in of the top until they unite in a rounded point, which is then drawn up. The pushing out and drawing in of the top of the "finger" from within is the manner in which it feeds. Thus the free end of the tube is apparently brought backwards and forwards, and the food triturated and carried into the œsophagus.

No eyes are visible, though Messrs. Quoy and Gaim. say they detected them *above.* They would be of no use above, as they would touch the shell. The aperture of the siphon is the same as in the last species. The process of the mantle which forms a kind of operculum, is often protruded a considerable distance from the shell. Messrs. Q. and G. say, "A little in front of the siphon is the female organ, and on the right side of the head the male, where the tentacle would be if there were one. These holes are very difficult to see. When the animal is taken from the shell it is found attached by a horse shoe muscle running round the posterior half of the shell above the mantle and foot. The siphon is seen as a tube running in a sinuous form through the pulmonary sac. By its side runs the intestine, which continues round the posterior part of the foot, and then disappears under the liver, and the ovary, which is often the largest organ, and of a bright salmon colour. The intestine makes many convolutions in the liver. The buccal mass is like the preceding species with the same kind of œsophagus, and, according to the Messrs. Q. and G., two large salivary glands below. The same authors say that the oviduct is carried under the uterus, which has the shape of a '*cornemuse*' (the wind-bag of a bagpipe?) with a neck opening in front of the siphonal fold of the mantle. Upon this organ, and a little folded upon itself, is applied the canal of the vesicle, which is common to all the pulmoniferous mollusca, and whose use is unknown." The authors believe it has an opening in common with the uterus. Full details of the nervous and reproductive organs are given by the same authors, which, however, I have been unable fully to verify, but without further examination, I could not pronounce any opinion as to the correctness of their careful observations.

The odontophore of this species differs from the preceding in being much broader and not so long or so much curved, but the place and arrangement is the same. The central tooth is rudimentary, and the series diminishes in length and width in a curved line outwardly until it becomes a series of tubercles.

Mr. Reeve *(Icon. Siph.)* mentions another species peculiar to Australia and Tasmania, *S. funiculata*, but I believe it to be no more than a variety of the preceding.

Dr. Otto, A.L., Mörch, has in the Annals of Nat. History (1865, *Vol.* 16, *p.* 73 *et seq.*) given some very interesting and important details on the Buccal organs of Mollusca. He uses the name Radula for lingual ribbon, which probably is on the whole more expressive and convenient than Odontophore.

JUNE, 1876.

The usual monthly evening meeting of the Society was held on Tuesday, 13th June, M. Allport, Esq., V.P., in the chair.

Ralph Tate, Esq., F.G.S., Professor of Natural History, University of Adelaide, was elected a Corresponding Member of the Society.

The Hon. Secretary brought forward the following returns for the past month :—

1. Number of visitors to Museum during May, 1348.
2. Ditto to Gardens ditto, 3506.
3. Seeds, etc., received at Gardens—From His Excellency F. A. Weld, Esq., 20 packets seeds (various). From Dr. G. Webster, New Zealand, 3 Tree Ferns. From Dr. Carl, New Zealand, 2 packets seeds.
4. Plants and seeds sent from Gardens—To Jules Cock et Cie, France, 1 packet seeds. To C. H. Huber et Cie, Hyeres, France, 1 ditto. To Villmorin, Andrieux, et Cie, Paris, 1 ditto. To Mr. S. Purchase, Parramatta, Sydney, 1 case seedling plants. To Messrs. Shepherd and Co., Sydney, 1 box plants. For the Hospital grounds, Launceston 30 Coniferæ. For the Church of England grounds, Bothwell, 130 plants.
5. Time of leafing, flowering, etc., of a few standard plants during the month.
6. Books and periodicals received.
7. Presentations to Museum.

Meteorological Tables.

1. Hobart Town—From F. Abbott, Esq., table for May.
2. New Norfolk—From W. E. Shoobridge, Esq., ditto.
3. Port Arthur—From Dr. Coverdale, ditto.
4. From Marine Board—King's Island tables for February, March, and April; Mount Nelson ditto for May.
5. From Government Observer, Melbourne—Printed tables for January and February.

The presentations to the Museum were as follows :—

1. From F. Groom, Esq., St. Mary's—A Brown Quail *(Synoicus australis)*, partially albino.
2. From A. Simson, Esq.—Skin and Skeleton of small Brown Rat *(Mus fuscipes?)*; Skin and Skeleton of a White-footed Rat *(Mus tasmaniensis Krefft?)*; Skin and Skeleton of *Antechinus swainsonii*, from Gould's Country.
3. From Mr. Stephenson—A Rail *(Rallus brachipus)*, shot at Jericho.
4. From Mr. J. Young, Wellington, New Zealand—A portion of the Submarine Telegraph across Cook's Straits, broken nine and a half years after submersion. In a note accompanying this presentation, the donor states that he "was informed by Dr. Pollon (Inspector-General of Telegraphs, N.Z.) that the breakage was not the result of friction, but was probably caused by some corrosive agency in the immediate locality of the fracture."
5. From Mr. A. Wilkins—Specimens of Copper Ore, Antimony, Ruby Tin, etc., etc., from Cudgegong, near Mudgee, N.S. Wales.
6. From Mr. L. Petersen—Tin specimens from Ringarooma.
7. From Mr. W. C. Blyth, Honeywood—Specimens of Cicada, etc., from the crown of a stringy bark tree.
8. From Mr. Lukin Boyes—A peculiar Caterpillar, from Gould's Country.
9. From Mr. Weeding, Oatlands—Two masses of a peculiar punk-like substance from a cavity in the heart of a tree.
10. From S. P. H. Wright, Esq., Glenorchy—A sheet of fungoid substance from a decayed tree.

11. From Mr. Guesdon—A slab of mudstone from Bruni Island, with numerous casts of fossils.

The SECRETARY mentioned that, owing to the extreme inclemency of the weather, the Rev. Julian Woods had kindly consented to postpone the reading of his paper till the next meeting, in order to afford to a probably much larger number of Fellows the opportunity of discussing it.

Mr. M. ALLPORT exhibited a plan, carefully prepared by Mr. T. Stephens, for the purpose of showing the general geological features of a portion of the North Coast of Tasmania, and defined the position of the two different forms of trap rock occurring there; and in the absence of any other business, Mr. Allport said, "I desire to record the alteration in my views as to the geological age of the more recent basalts on the south side of the island. The Fellows of the Society will remember that some years ago a large number of fossil bones, in a comminuted condition, were discovered in the Travertin, worked for lime at Geilston Bay, on the other side of the Derwent, below Risdon. Upon examination, these bones all proved to belong to existing species, viz., *Phalangista fuliginosa*, *Hypsiprimni*, etc., and the conclusion was then come to that the Travertin must be of recent tertiary or post-tertiary age. For many years previous to the discovery of the bones abundant vegetable remains had been observed in this Travertin; these consisted of leaf impressions and fossil wood. A considerable number of land shells of at least four species, Helix (two species), Vitrina, and Bulimus, were also frequently found. Many of the leaf impressions bore a superficial resemblance to the leaves of plants now existing; but well knowing the difficulty of determining species by the examination of such slight remains, I always preferred waiting the discovery of a larger series of specimens before coming to hasty, and probably erroneous, conclusions. Upon the discovery of the bones, however, Mr. Gould and myself both assumed that the Travertin was very recent; and this was the more important, geologically, from the fact recorded in our transactions that the bed of Travertin had been displaced by a dyke of basalt, clearly proving that, however recent the Travertin, the basalt was still more recent. Shortly after the discovery of the bones, however, I came upon some fossils in solid portions of the Travertin, that went far to shake my preconceived notions of its recent age. These fossils consisted of three seeds, all differing from any now existing, the most remarkable being about the size of a walnut, but divided by fine lines in to five equal segments. These seeds I forwarded to Baron Von Müeller, with many of the leaf impressions. As to the smaller seeds, he desired to have more specimens before coming to any conclusion; but as to the specimen above described, he at once founded a genus upon it, and pointed out its affinities to extinct types in the Tertiaries of Victoria. I still felt some hesitation in concluding from this one specimen that the age of the Travertin must be put back to an earlier geological epoch, because some of the excrescences caused by insects on our existing trees bear considerable resemblance to the fossil referred to. Now, however, I am happy to say, two other specimens, showing not only the external markings of the first, but also the divisions of the septa in which the seeds had lain, have been discovered, proving the learned Baron to have been quite correct in his conclusion as to the nature of the first fossil. At the same time as the last mentioned specimens, two other well-marked seeds were also found, one about the size of a hazel nut, but divided longitudinally into equal valves; and the other a very interesting form when taken in connection with some of the impressions abounding in the vicinity. It consists of a well-marked cast of a cone, from which the seeds have dropped out, about an inch in diameter, of a somewhat circular form, and quite dissimilar to any now existing in Tasmania. The discovery of these fresh and unmistakable proofs of the earlier age of the Travertin caused me to inquire a little more fully into the history of the bones before mentioned, as it is very difficult to reconcile the presence in the same geological matrix of an existing fauna and an extinct flora ; the bones were quite unaltered chemically, and no bone was whole except the teeth and minute phalanges, every long bone being ground up in to small pieces. They were all found in one limited area beneath, and amongst blocks of Travertin, not in solid Travertin, as the impressions and seeds are, but in an arenaceous and slightly calcareous matrix. Much of the fossil wood found in the Travertin is more or less silicified, the rest being converted to carbonate of lime, and if the bones had been subjected throughout the same period to the same chemical conditions as this fossil wood, I cannot doubt that they would have been silicified, or at any rate bedded in solid carbonate of lime. Taking all the circumstances into account, it seems probable that when the basalt dyke displaced the bed of Travertin, it caused the mass to be broken and rent in various ways, especially near the points of contact between the molten basalt and the Travertin, and that long after the cooling of the mass some of the fissures thus made were occupied by some of the carnivorous marsupials, and in the course of time these fissures, with the layers of comminuted bones—the remains of the prey devoured by the early inhabitants—have been choked up with the constantly accumulating diluvium, consisting of washed sand and particles of the Travertin weathered off the adjacent rocks. If this conclusion is correct, we must of course regard the basalt referred to as an earlier formation than the diluvium from which the bones referred to were obtained, but still as of later date than the Travertin. Mr. R. M. Johnston, who is so indefatigably working out the tertiary deposits on the North side, will doubtless throw much light on the subject of these recent basalts, and I therefore look forward with considerable interest to the reading of his paper, postponed from to-night, under the impression that we should get no meeting.

The SECRETARY reported that, in reply to the letter addressed by the Royal Society to the Municipal Council in reference to the destruction of the trees and ferns on Mount Wellington, he had received, from the Town Clerk, a copy of the correspondence which had taken place on the subject. Several extracts from this correspondence were then read from which it was evident that the powers of the Town Council in the matter were very limited. Discussion (in which Mr. P. T. Smith, Mr. Grant, Mr. Shoobridge, Dr. E. Crowther, the Chairman and Secretary took part) ensued, when the feeling of the meeting appeared to be that as the various Fern-tree Valleys were of little value to their possessors, enquiries might be made if they could be purchased back at a reasonable rate for the purpose of being secured to the public for ever.

The SECRETARY, in connection with a matter which he desired to introduce, observed it might, perhaps, be necessary to inform some of the junior Fellows that Sir John Franklin was the founder of this Society. To assist it in its infancy, he very kindly placed at its disposal a room at Government House for the monthly meetings, and in addition to this, at the close of the proceedings, the members generally found a liberal banquet provided for them. Perhaps, indeed, for the latter they were indebted to the kindness of Lady Franklin, whose zeal and enthusiasm in all matters connected with the scientific interests of the colony were known to all. Not long ago a marble tablet bearing an inscription from the pen of the poet Laureate, had been placed in Westminster Abbey to the memory of Sir John, and recently he (the speaker) had observed in *The Mercury* a note signed "Jack Tar," in which it was suggested that this inscription might very appropriately be engraved on the granite pedestal of the bronze statue to Sir John in Franklin Square. The suggestion appeared to him to be a very good one, and considering how much we owed to Sir John he thought the Society would gladly entertain the motion he now begged to propose, which was to the effect that a communication should be addressed to

Government with a request that the inscription should be placed as suggested on the pedestal. He might perhaps be excused if he added, although it was but a private matter, that he had some personal feeling in making this proposition as in times long past he had received much kindness from Sir John Franklin, and indeed it was the offer of appointment as his Private Secretary which first induced him (Dr. Agnew) to leave Victoria in order to settle in Tasmania. The inscription, as perhaps all present would recollect, was

"*Not here;* the white North has thy bones, and thou,
Heroic sailor-soul,
Art passing on thy happier voyage now,
Toward no earthly pole."

Mr. C. H. GRANT had much pleasure in seconding the motion, which was cordially adopted.

Mr. P. T. SMITH, referring to the severe storm with which we were visited on the previous evening observed it was a dead calm in the city in the early part of the day. During this calm his attention had been directed to the loud roaring noises proceeding, without any visible cause, from the mountain. They were very remarkable, although not so loud as those he had formerly heard on the Western Tiers. He would be glad to know if they had been heard by others. No one present had noticed them, but

Mr. W. E. SHOOBRIDGE stated he had no doubt they were due entirely to the action of high winds on the trees. He would not be surprised to learn that a storm raged on Mount Wellington when it was calm in Hobart Town, as he had observed that these storms were frequently very local in their action. At New Norfolk there were two ranges of hills with but a moderate sized valley between, yet he had himself noticed a loud storm raging on one of the ranges whilst it was quite calm on the other. He fancied the direction of the wind had a very considerable influence (at least at New Norfolk) on the noises, as they appeared to be much louder when it blew from the N.W. than from any other quarter.

The proceedings then terminated.

[The following paragraph was accidentally omitted from the report of the May meeting.]

Mr. Justice DOBSON exhibited a curious case in which the underground stem of couchgrass had pierced through the bulb of a hyacinth. The growing point of the stem, on meeting the bulb, instead of being deflected and passing around it, had pursued its direct horizontal course and forced its way through the obstacle. Mr. Dobson had noticed many instances of this, and occasionally the same stem was found to have even gone through several bulbs.

JULY, 1876.

The monthly evening meeting of the Society was held on Tuesday, the 11th July, His Excellency, F. A. Weld, Esq., C.M.G., President, in the chair.

E. J. Manley, Esq., who had previously been nominated by the Council, was, after a ballot, declared duly elected as a Fellow of the Society.

The Hon. Secretary (Dr. Agnew) brought forward the usual returns for the past month, viz. :—

1. Number of Visitors to Museum, 1377.
2. Ditto ditto to Botanic Gardens, 2871.
3. Plants and Seeds received at Botanic Gardens—From Mr. G. Farnsworth, Matlock, England, 300 seedling Rhododendrons, all living. From Chamber of Agriculture, Washington, America, 63 packets of seeds, principally Coniferæ. From Mr. S. Purchase, Parramatta, Sydney, 60 plants. From Dr. Carl, Wellington, N.Z., 6 packets seeds. From Messrs. Nardy and Co., Hyeres, France, 16 packets of seeds.
4. Plants and Seeds sent from Gardens—To the Acclimatisation Society, Paris, 12 packets of seeds. To Botanic Gardens, Melbourne, one case of plants. To Mr. S. Purchase, Sydney, a box of seeds.
5. Plants supplied for decoration of public places—To the Queen's Asylum, a collection of flowering plants. To the Cornelian Bay Cemetery, 180 plants.

Meteorological Returns :—

1. Hobart Town, from F. Abbott, Esq.—Table for June.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Port Arthur, from Dr. Coverdale.—Ditto.
4. Mount Nelson, table for June; Goose Island, ditto for May—From the Marine Board.

The presentations to the Museum were as follows :—

1. From Mr. J. J. Martin—Specimen of Limestone from Dunedin, New Zealand, used extensively for building purposes.

[The Rev. J. E. Tenison Woods observed that the same kind of stone occurred in South Australia. It was composed of carbonate of lime with a little silex, and was full of Foraminiferous shells. The chalk of Dover Cliffs was a similar formation, as was also the Globerigina ooze deposit now going on at great ocean depths, as shown by the Challenger dredgings. The specimen, however, though similar to, was probably of an older formation than the Australian—most likely of the Lower Cainozoic.]

Samples of Lignite and Coal from Green Island, Greymouth, Shag Point, and Kaitangata, New Zealand.

2. From Dr. E. Crowther.—A specimen of the Nankeen Night Heron (*Nycticorax caledonicus*) from George's Bay.
3. From D. M. Barnard, Esq.—Specimen of the Yellow-bellied Beaver Rat (*Hydromys chrysogaster*).
4. From the Belmont Company.—A collection of Tin specimens from the lode, Cascade River, Ringarooma.
5. From Mr. J. Keen, Kingston.—A sample of a deposit consisting of a brilliant scaly substance, resembling mica, the nature of which has not yet been determined. A specimen of the clay from which the deposit was obtained by washing.
6. From Mr. F. Edwards.—Tusk of a large Boar, shot in New Zealand.
7. From Mr. R. M. Williams, Sydney, per Mr. Justin Browne, crystals of oxide of tin, and two sapphires, from Queensland.
8. From R. M. Johnston, Esq.—A collection of Tertiary Fossils from the Table Cape beds, named and classified by the Rev. J. E. T. Woods, F.G.S.

In reference to a specimen of *Cyathea medullaris*, presented by S. B. Emmett, Esq., Circular Head, for the Royal Society's Gardens, Mr. Stephens remarked that the Society was under great obligation to the donor for having forwarded another specimen of this Tree Fern, the first having died. It was especially interesting from the fact that its proper habitat is New Zealand, and only one small group is known to exist in Tasmania, deep in one of the dense forests near Circular Head.

Mr. BARNARD exhibited a section of the stem of a cherry tree showing the burrow, several inches in length, of a destructive caterpillar, with the animal still in situ. Mr. Barnard had noticed a blight on the cherry tree for the first time last year, but this was the first occasion on which he had seen the caterpillar. It would be of great interest, he thought, to determine the character of the moth which would eventually be produced.

Mr. J. SWAN had seen the same caterpillar on more than one occasion on the pear tree also.

The Rev. J. E. TENISON WOODS, after giving a very clear and exhaustive address on the history of Australian Geology, read a paper by Mr. R. M. Johnston entitled, "Notes on the Tertiary Marine Deposits of Tasmania." The paper, which was of a most elaborate character and illustrated by a large series of specimens, was most favourably commented upon by the reader, and was listened to with marked attention by the meeting.

Mr. STEPHENS said that the Table Cape fossiliferous beds had been mentioned by Strzelecki as a "raised beach bedded on basalt;" but that he had shown in a paper read before the Society in 1869, after a cursory inspection of the locality, that they were clearly older than the basalt, and that the fossils proved them to be connected with the tertiary deposits of Victoria. He regretted that the author of the very interesting and valuable paper which had just been read was unable to be present, for there were still some points requiring consideration before the exact relationship of the marine beds to the igneous and other rocks of the neighbourhood could be positively determined; and these they could not discuss satisfactorily in his absence.

After a short discussion the cordial thanks of the meeting were (on the motion of Mr. STEPHENS, seconded by Mr. ALLPORT) accorded to Mr. Johnston for his valuable paper, and to Mr. Woods for his admirable address.

A vote of thanks to the donors of presentations closed the proceedings.

AUGUST, 1876.

The usual monthly evening meeting of the Society was held on Tuesday, 8th August; His Excellency the Governor, President, in the chair.

The Hon. Secretary (Dr. Agnew) brought under notice the following returns for the past month, viz.:—

1. Number of visitors to Museum, 2,368.
2. Ditto ditto Gardens, 3,704.
3. Plants and seeds sent from Botanic Gardens:—To the Botanic Gardens, Christchurch, New Zealand, 48 plants; to Mr. G. Brunning, Melbourne, one case of plants and seeds.
4. Plants supplied to public places:—To church grounds, Avoca, 50 plants; to Horton College, Ross, 100 plants; to Congregational Church, Richmond, 36 plants.
5. Time of leafing, flowering, etc., of a few standard plants in Botanic Gardens during the month.
6. Books and periodicals received.
7. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq.—Table and abstract for July.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. From the Marine Board—Tables from Bruni Island for April, May, and June; Mount Nelson, ditto for July.
4. Port Arthur, from Dr. Coverdale—Ditto.
5. Sydney, from H. C. Russell, Esq., B.A.—Printed tables for April.

The presentations to the Museum were as follows:—

1 From Miss Gulliver—Two prepared skins of the Pied Egret (*Herodias picata*); two ditto of the Green Pygmy Goose (*Nettapus pulchellus*); one of Pink-eyed Duck (*Malacorhynchus membranaceus*); one of Little Turtle Dove (*Stictopelia cuneata*).
2. From Mr. R. Savage—A Grey Flying Squirrel (*Belideus sciurus*) from River Shannon, Tasmania.
3. Curious horny growth from the ear of a sheep.
4. A specimen of the Cinereous Crow-Shrike (*Cracticus cinereus*), shot in the act of killing a small bird.
5. From Master E. Hood—A specimen of the Gulf-Weed (*Sargassum*), procured on the voyage to England.

The Rev. J. E. Tenison-Woods then read a paper on a new species of *Ampullaria* with some observations on Swainson's genus *Thelidomus*, of which a species occurs in Tasmania, the animal being unknown. He also laid on the table descriptions of several new species of Tasmanian Marine Shells, mostly from the collection of Mr. Ronald Gunn, who had kindly presented them to the Society, and most liberally placed all his collection at his (Mr. Wood's) disposal for description. Some species had been furnished by Mr. Augustus Simson from George's Bay. Mr. W. F. Petterd had also shown a considerable number of decidedly new species, the result of his own careful collection during many years. Mr. Woods could not, however, undertake to describe these unless type specimens were placed in the Museum for future reference, as it was not fair to science to describe species without giving future naturalists an opportunity of verifying, correcting, or extending the observations.

The reverend gentleman then made some remarks with reference to the *viva voce* introduction which he gave to Mr. R. M. Johnston's paper at the previous meeting, and subsequently, at the request of the Society, on the motion of His Lordship the Bishop of Tasmania, promised to commit them to writing for the purpose of publication in the Transactions.

Discussion followed.

The Bishop asked whether the Gault formation was found in Australia, and if the Sauroid fishes were such as *Ichthyosaurus* and ***Plesiosaurus.*** He regretted that he could not be present during the former lecture as well as on this occasion, but should like to add another question. He remembered that geologists of a few years' back had called attention to the persistence in Australia of secondary forms such as *Trigoniæ and Terebratulæ,* and would wish to know whether these resemblances had been increased or lessened by subsequent investigations ?

The Rev. J. E. Tenison-Woods said that he was not aware of the Gault having been found in Australia; but both *Ichthyosaurus* and ***Plesiosaurus*** had, but of new species, showing how widely the genera had formerly extended. He did not think that the resemblance between Australia and the Mesozoic had increased with a more extended study of its natural history, and, taking them altogether, they were not very strong, it must be admitted, and confined to isolated instances subject to no apparent rule.

Mr. Stephens bore testimony to the cretaceous character of the formations around the Gulf of Carpentaria. He himself had seen fossils, such as Belemnites, Inoceramus, etc., which, he was informed, might be gathered in great quantities from the surface. He was quite sure that the only reason why they were not better known was the difficulty of transport, as every fossil had to be brought down many hundred miles on horseback.

His Excellency said that in New Zealand extensive Mesozoic formations had been discovered, which were very similar in every respect to contemporary formations of Europe. Many years ago, when out exploring, he had come upon fossiliferous cliffs, which had at once attracted his attention as being so like the blue Lias clays which he had known almost from his childhood in Lyme Regis, and other places in Dorsetshire. Since then the beds had been examined, and determined to be true equivalents of the Lias, and the usual Ichthyosauroids of such formations had been found. The resemblance between the two deposits must have been very close when it had struck his unpractised eye, for at that time he had given scarcely any attention to the subject.

The Secretary proposed that on this occasion a special vote of thanks should be accorded to the Rev. Julian Tenison-Woods, not only for the interesting matter he had just brought under their notice, but also for the invaluable work he had done in the cause of the Natural History of Tasmania since they had the honour of having him as a working member. The results of this work would appear in the Transactions, but he (the Secretary) had had such opportunities of observing the vast amount of time and labour it had cost, that he felt the Society was under the deepest obligations for it. It was, therefore, with feelings of the greatest pain he had just learned that Mr. Woods was soon about to leave Tasmania. He was sure they would all feel that the Society could sustain no severer loss. They would greatly miss in the future those learned, lucid, and eloquent addresses with which Mr. Woods had illustrated so many subjects, and as to which it might truly be said,—"*Nullum quod tetigit non ornavit.*" He did not know if the reverend father was ever likely again to visit Tasmania, but if such should be the case he (the Secretary) could certainly say that from no portion of the community would he receive a warmer welcome than from the members of the Royal Society. (Applause.)

The Bishop cordially seconded the motion, and observed as to the remark by Mr. Woods, that he had refused to describe some new Tasmanian shells which had recently been shown him because the owner could not afford to deposit them in the Museum where his descriptions could if required be tested by future naturalists, that he felt this remark was entirely due to that modesty which was characteristic of the true student of science. Descriptions from the pen of Mr. Woods, however, had nothing to fear from criticism. At the same time he hoped the specimens referred to might, if possible, be purchased in order that the Society might have the advantage of having them properly described and named, and the list of Tasmanian shells thus rendered as complete as possible to date.

The Rev. J. E. Tenison-Woods, in returning thanks, remarked it had given him great pleasure to do what little he had done for the Natural History of Tasmania. It was pleasant, however, for every one to find his work appreciated, and he must say he had always found that the Royal Society had recognised in the kindest spirit whatever he had been able to accomplish. The library of the Society had been of the greatest assistance to him, and he was most happy in being able to congratulate the Fellows on the possession of the best and most extensive collection of scientific works in the Australian colonies. He was also glad to have the opportunity of thanking the officers of the Society for their unvarying courtesy, and his thanks were especially due to their Curator, Mr. Roblin, to whom he had been frequently indebted for assistance of the most valuable character always most willingly rendered. (Applause.)

A vote of thanks to the donors of presentations closed the proceedings.

SEPTEMBER, 1876.

The monthly evening meeting of the Society was held on Tuesday, 12th September, upwards of forty Fellows being present. His Excellency the Governor occupied the chair.

The following gentlemen, who had been previously nominated by the Council were balloted for and declared duly elected as Corresponding Members of the Society, viz., Dr. R. Schomburgk, Director of the Botanic Gardens, Adelaide; and Mr. John Brazier, C.M.Z.S., of Sydney. Mr. R. W. G. Shoobridge was also elected a fellow.

The SECRETARY brought under notice the usual returns for the past month, as follows :—

1. Number of visitors to Museum, total 1,897.
2. Ditto ditto Gardens, ditto 3,683.
3. Plants and seeds received at Gardens :—From A.Thozet, Esq., Queensland—A parcel of seeds of *Macrozamia perowskiana, M. migueli, Cycas, angulata,* and *Bowenia spectabilis.* From Mr. G. Brunning, Melbourne.—78 plants. From Messrs. Shepherd and Co., Sydney. —63 plants, 37 varieties of fruit scions, and 83 packets Australian seeds.
4. Plants supplied.—To Cornelian Bay Cemetery, 150 plants.
5. Time of leafing, flowering, and fruiting of a few standard plants in the Botanic Gardens during August.
6. Books and Periodicals received.
7. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq.—Table for August.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Port Arthur, from Dr. Coverdale—ditto.
4. From the Marine Board, the following tables—Mount Nelson for August; King's Island for May and June; Goose Island for June and July; Kent's Group for May, June, July and August.

5. Melbourne, from the Government Observatory, printed tables for April and May.

The presentations to the Museum and Library were as follows :—

1. From Mr. G. W. Briant—32 specimens of Tasmanian *Lepidoptera,* collected and mounted by donor.
2. From Mr. O. Hickman, per Mr. G. Richardson—a living specimen of the "Porcupine Ant-Eater" *(Echidna setosa.)*
3. From Mr. Bealey.—A curiously-shaped Fungus (probably *Polyporus igniarius*) from a tree.
4. From Mr. W. Legrand.—Type specimens of new Tasmanian Shells *(Cominella tenuicosta, etc.),* in all about fifty specimens.
5. From Mr. C. E. Davies.—A Chestnut-faced Owl *(Strix castanops).*
6. From Mrs. Meredith.—Skin of a variety of Opossum, known locally as the "Rock Opossum."
7. From Mr. Blyth, Honeywood.—Nests of Mason Wasp, taken from between a map and the wall on which it was suspended.
8. From the Rev. Brooke Bailey.—Three silver and three copper coins, viz., 2 Ceylon 1 cent and 5 cents; 1 quarter rupee, 1 10 cents; 1 ditto Hong Kong, 1 chellie, Dutch East India Company.
9. From Mr. Miles—A tiger shark, caught off the Passage Mouth. This fish measured 8ft. 5in. in length, and its liver yielded three and a half gallons of oil.

10. From Mr. Roberts, Victoria, Huon—A large mass of Fibrous Tissue, found close to a tree which had recently been struck by lightning. The mass presented, in some degree, the appearance of very coarse oakum, and was composed entirely of the woody fibre of the bark—all the cellular tissue having been removed by the shock of the lightning or otherwise.
11. From His Excellency the Governor.—"On the movements and habits of Climbing Plants," by C. Darwin M.A., F.R.S., 2nd edition.
12. From the Hon. the Colonial Secretary.—"Australian Orchids," by R. D. Fitzgerald F.L.S. part 2.
13. From the Government of New South Wales.—A Mineral Map of New South Wales, and a pamphlet on the progress and resources of that colony.
14. From Baron Ferd von. Mueller.—Two pamphlets containing "An Educational lecture of the food of Plants," by R. W. McIvor, Esq., "On select Textile Plants," and a "Lecture on Tea," by Baron F. von. Mueller.
15. From the Taylerian Museum, Haerlem.—"Records of the Museum, vols. 1, 2, 3, and 4" (twelve parts beautifully illustrated.)

A fine collection of insects from Gould's Country was exhibited by A. Simson Esq., and attracted much attention.

His Excellency read a long and interesting paper entitled "Reminiscences of a visit to the Volcanoes of Hawaii."

Sir Robert Officer proposed a vote of thanks to the donors of presentations, and especially to the President for his very interesting and graphic narrative. He (Sir Robert Officer) had read several accounts of the great volcanoes of Hawaii, but from none had he derived so clear and satisfactory a conception of the subject as from that he had just had the pleasure of listening to. As he was necessarily an infrequent visitor he begged to that opportunity of expressing the extreme gratification he felt at seeing such a very large attendance of Fellows—an attendance which contrasted most favourably with many he had witnessed in former years. He had no doubt, however this was in a great measure due to the fresh impulse given to the Society by the warm interest which His Excellency had always taken in its affairs, and of which hehad furnished abundant proofs by reading papers, presiding at the meetings and otherwise. Under such favourable auspices he felt that the Society must still continue to make progress and achieve still greater successes than any it had already accomplished.

The vote having been carried by acclamation, His Excellency briefly returned thanks, and the proceeding terminated.

OCTOBER, 1876.

The usual monthly evening meeting of the Society was held on Monday, the 9th October, James Barnard, Esq., in the chair.

George Corney Westbrook, Esq., who had been previously nominated by the Council, was balloted for and declared duly elected a Fellow of the Society.

The following returns for the past month were laid before the meeting :—

1. Number of visitors to Museum, 2,006.
2. Ditto to Gardens, 4,181.
3. Plants and seeds received at and sent from Gardens.
4. Time of leafing, flowering, and fruiting of a few standard plants in the Botanic Gardens during September.
5. Books and Periodicals received.
6. Presentations to Museum and Library.

Meteorological Tables :—

1. Hobart Town, from F. Abbott, Esq.—Table for September.
2. New Norfolk, from W. E. Shoobridge, Esq.—Ditto.
3. Port Arthur, from Dr. Coverdale—Ditto.
4. From the Marine Board—Tables from Mt. Nelson for September; South Bruni, ditto; Swan Island for June, July, and August; Goose Island for August.
5. From Government Observer, Sydney—Results of observations made in 1874, and tables for 1875.
6. From Government of New Zealand—Printed tables from January to May, 1876. Comparative table of climate for 1875, New Zealand; Meteorological tables, January to March, 1876, Wellington, N.Z.

The presentations to the Museum were as follows :—

1. From Mrs. J. Bidencope—Two cases of Butterflies and Moths, from India.
2. From Master L. Forrest—A case containing 33 specimens of British Butterflies and Moths.
3. From Mr. Robert M. Browne, Wellington, New Zealand—15 New Zealand and 3 Australian copper tokens.
4. From Mr. Nairn—Two black snakes *(Hoplocephalus curtus)* from Kangaroo Valley.
5. From Mr. Spencer—Sample of coal from Jerusalem.
6. From Mr. P. Feeney—Ditto from Sandfly Rivulet.
7. From Mr. T. Nichols—Ditto from Port Cygnet.
8. From Mr. P. Pearsall—A Tiger Cat *(Dasyurus maculatus).*
9. From Mr. Turner—A Musk Duck *(Biziura lobata).*
10. From James Scott, Esq., M.H.A.—An aboriginal stone implement from Mount Morriston.

[Mr. Scott considers this to be one of the best specimens of these implements which he has presented. He states that the natives held the stones with the thumb on the flat surface, the rounded side resting in the palm of the hand. In use the stone was kept turning round so as to bring different parts of its edge to bear on the work. As to the mound supposed to cover an aboriginal grave, referred to at a former meeting (August 1875), Mr. Scott reports that on digging up the spot the traces of a fire, some pieces of charcoal, and a quantity of a "greasy" kind of red clay or ochre were found, but no bones of any description.]

11. From Mr. J. Fergusson, Tinderbox Bay A collection of shells, from Cloudy Bay, South Bruni.
12. From Miss Florence Abbott, per Rev. W. W. Spicer—A samplè of "Pulu."

[Pulu, or hairs taken from the base of the fronds of tree ferns, and employed for stuffing mattresses, etc., in the Sydney Infirmary and the Hobart Town Hospital. About 2 lbs. of the hairs are required for a large pillow, at a cost of 6d. per lb. The material lasts for many years, during which it continues sweet and clean, but at last the hairs break up and crumble into dust.]

13. From Captain W. V. Legge, R.A.—A living specimen of the white-bellied Sea Eagle, from Ceylon.

[Captain Legge states "this is a very fine immature Sea Eagle *(Haliætus leucogaster)*, which I beg to present to the Royal Society. It is, I consider, a bird of some interest as regards Tasmania, as it is the same species as our Fish Hawk; and will illustrate the young plumage very well. I do not think this plumage is well known in Tasmania. It will attain to its mature, white dress, next year, and it will then be interesting to naturalists to observe whether it exactly corresponds with Tasmanian adult examples in the Museum." He adds, "I presume a place for its reception could be put up in the Gardens, and that done, no difficulty will be experienced in feeding it, as it will eat offal and meat of all sorts. Might not this form a foundation for a collection of Raptores, which the Society could surely keep without much expense. Young Eagle Hawks might be got by making the wish known. Harriers (Swamp Hawk, *Circus assimilis)* I know may be procured, for I saw a beautiful specimen in the possession of a gentleman at the Hospital at Campbell Town."]

Presentations to Library—

1. From the United States Naval Observatory, Washington—"Astronomical and Meteorological observations, 1870 and 1872," 2 Vols, 4to. "Catalogue of Stars, 1845 to 1871," 1 Vol., 4to. "Zones of Stars observed with mural circle, 1846-1849," 1 Vol., 4to. "Ditto observed with transit instrument," 1 Vol., 4to. "Results of observations, 1853-1860," 1 Vol., 4to. "On the Right Ascensions of the Equatorial Fundamental Stars," 1870, 1 Vol., 4to. "Report on Difference of Longitude between Washington and St. Louis," by Professor Harkness, 1 Vol., 4to.
2. From the Chief Signal Office, Washington—"Report of Chief Signal Officer, War Department, U.S. America, for 1872," 1 Vol., 8vo. "Daily Bulletin," December, 1872, January and February, 1873, 3 Vols., 4to.
3. From the Smithsonian Institution, Washington—"Smithsonian Miscellaneous Collections," Vol. 10. "Smithsonian Reports," 1871 and 1873, 2 Vols., 8vo.
4. From F. V. Hayden, Esq., United States Government Geologist—"Report of Geological Survey of the Territories," Vol. 6. "Cretaceous Flora," 1 Vol., 4to, "Geological and Geographical Survey of Colerado," 1873, by F. V. Hayden, 1 Vol., 8vo. "Birds of the North West," by Elliott Cones, 8vo (two copies). "Synopsis of Flora of Colerado," pamphlet, pp. 180. "Bulletin of United States, Geological and Geographical Survey of the Territories," No. 2, and 2 and 3, 2nd Series, 3 pamphlets. "Lists of Elevations of portion of U. States, West of Mississippi River," 1 pamphlet. "Catalogue of Publications of U.S. Geological Survey."
5. From the Boston Society of Natural History—Memoirs of the Society, Vol. 2., part 2, No. 4; part 3, Nos. 1 to 5; part 4, No. 1 (7 parts). Proceedings of the Society, Vol. 15, parts 3 and 4; Vol. 16, parts 1 to 4; Vol. 17, parts 1 and 2, 8 parts. The "Jeffries Wyman Memorial Meeting of the Society," 1 pamphlet.
6. From the Buffalo Society of Natural Sciences—Bulletin of the Society, Vol. 1, No. 4; Vol. 2, Nos. 1 to 4 (5 parts).
7. From the Essex Institute, Salem, Massachusetts—Bulletin of Institute, Vols. 5, 6.
8. From the American Philosophical Society—Proceedings, Vol. 14, Nos. 92, 93, 94.

9. From American Academy of Arts and Sciences—Proceedings, New Series, Vol. 9. "Commemorative Notice of Louis Agassiz," by Theodore Lyman.
10. From the Anderson School of Natural History, Penikese Island—Report of Trustees, 1873.
11. From Museum of Comparative Zoology, Harvard College—Report, '73.
12. From Board of Public Education, Pennsylvania—Report for 1874.
13. From the Howard University, Washington—Report 1875-76.
14. From the Royal Society of New South Wales—Proceedings of the Society, Vol. 9, 1875.
15. From the Adelaide Philosophical Society—Reports and Transactions 1867, 1868, 1871 and 1872. "Law in Nature" by R. D. Hanson, Esq., Chief Justice of South Australia. Papers "On the Tertiary Rocks of South Australia," by the Rev. J. E. Tenison-Woods; "On the Geology of the South East," by Mr. Chief Justice Hanson; on the same by the Rev. J. E. Tenison Woods; "On the Urarie (arrow poison) of the Indians of British Guiana, by Dr. Schomburgk; "Explorations on West and North West Coasts of Australia," by Mr. C. A. Wilson; On City Drainage" by Mr. J. Macgeorge, etc.

Special attention was called to the valuable presentation of books, on various scientific subjects, from the United States Government, and from the Smithsonian Institution and other learned Societies in America.

In the absence of the author, the Rev. J. E. Tenison-Woods, F.L.S., F.G.S., Corresponding Member of the Royal Societies of New South Wales and Tasmania, and of the Linnean Society of New South Wales, the Secretary read a paper "On a new-reversed Helix *(Helix weldii)*," discovered by Mr. W. F. Petterd on the North-West Coast, near Circular Head.

The SECRETARY also read a communication from J. E. Calder, Esq., on the language of the Aborigines of Tasmania. Accompanying this was a large and very carefully prepared compilation by Mr. Calder of all the known aboriginal words preserved by various collectors; and so arranged that each collector has the credit of all words added by him to the general stock. This great vocabulary was inspected with much interest by all present.

Mr. M. ALLPORT observed, in order to continue the history of our salmon to the latest date, that he had to report the capture of a fine grilse, weighing about three pounds, in the harbour about a fortnight ago. As it was taken in a "graball" net, the probability, or rather certainty, was that great numbers of fish were in the river. He had carefully examined this specimen, and had no doubt whatever as to its being a *salmo salar*. It had been presented to His Excellency. Previous to this capture, another fish of a similar size had been caught near the same locality, but it had not been brought under his observation.

A few days ago, however, a third salmon was taken, and on this occasion under very satisfactory circumstances. It was caught by Mr. M. Seal with the fly, about two miles above New Norfolk. Great numbers of fish were rising in all directions at the same time. In some rivers it is known that the salmon will not rise to the fly, and doubts had been expressed as to whether the Tasmanian fish would do so or not. This capture therefore is an important one for anglers, as it sets the question at rest. The fish was a fine grilse of about three pounds in weight, on its way from the salt to the fresh water.

Mr. SEAL stated that the fish was very lively and gave excellent sport, in this respect contrasting most favorably with the trout.

On the motion of Mr. SWAN, seconded by Mr. W. E. SHOOBRIDGE, the thanks of the meeting were given to the Rev. J. E. Tenison-Woods, to the donors of presentations, and specially to Mr. Calder for his valuable and carefully compiled vocabulary.

The proceedings then terminated.

NOVEMBER, 1876.

The monthly evening meeting of the Society was held at the Museum on Monday, the 13th Nov. His Excellency the Governor, in the chair.

Messrs. Edward J. Freeman and John Sharp, who had previously been nominated by the Council, were balloted for and declared duly elected as Fellows of the Society.

The Secretary brought under notice the usual monthly returns, viz.,

1. Number of visitors to Museum during October, total, 1709.
2. Ditto, to Gardens, 3598.
3. Seeds introduced into Gardens.
4. Time of leafing etc., of a few standard plants in Botanic Gardens during October.
5. Books and Periodicals received.
6. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq., Table and Summary for October, Results of 35 years observations (1841 to 1875 inclusive), with table showing excess of spontaneous evaporation over rainfall for ten years (1866 to 1875.)
2. New Norfolk, from W. E. Shoobridge, Esq., Abstract table for October.
3. Port Arthur, from Dr. Coverdale. Table for October.
4. From the Hobart Town Marine Board, the following tables :—Mount Nelson, for October ; Swan Island, for September ; Goose Island, for September ; King's Island, for July, August, and September.

In reference to the gales which prevailed on the Australian coasts during September, the following remarks, by Mr. E. N. Spong, Superintendent of the King's I. Lighthouse, appear in the table furnished by him for that month :—" These gales had all the characteristics of a cyclone, blowing with great fury, backing 16 points, then calm, and deluge of rain ; sudden fall of barometer from 29·16in. to 28·94in. in one hour. Then a violent gale at N.E., 10·42lb. per square foot, shifting in a few seconds to S.W., with a pressure estimated at 15·60lb. per square foot ; barometer rising to 29·12 by 9hrs. 30min. Frequent violent gusts with hail, wind backing six to eight points. Midnight, steady violent gale ; no thunder or lightning at any time. The greatest force is marked at 15·60lb. per square foot by estimation. Having no anemometer, possibly it may have been much greater. Barometer not so low since October 26th, 1863.

5. From Mr. Roblin. Abstracts and Results of Meterological Observations, taken at the lighthouses and other coast stations in Tasmania, during five years (1870 to 1875), compiled from the monthly tables furnished by the Hobart Town Marine Board, and the Commandant, Port Arthur.

The presentations to the Museum were as follows :—

1. From Mr. Arthur R. Johnston, Telegraph Department, Townsville, Queensland. A net bag made by the Aboriginies of Northern Queensland.
2. From Mr. W. Free, Muddy Plains. A species of Petrel (Broad-billed Prion,—*Prion vittatus*) shot inland.
3. From L. R. Castray, Esq. A very large egg laid by a half-bred Brahma Pootra fowl. This egg weighed 5¼ ounces, and had a smaller egg within it.
4. From the Rev. G. Brown, Wesleyan Missionary, Sydney. Eight spears and three clubs from New Britain and New Ireland.
5. From Mr. J. S. Roberts, Victoria, Huon. Specimen of the White-fronted Falcon *(Falco lunulatus).*

6. From Mr. A. Wilkins. Specimens of Dolomite, and Silver Ore from Mitchell's Creek, Bathurst, N. S. Wales. The donor states that this ore yields by assay gold 8 per cent., silver 30 per cent., and copper 9 per cent ; the lode being 13ft. 6in. in thickness.
7. From Mr. O'Keefe. Barnacles from bottom of steamship Mangana.
8. From Mr. John Brazier, C.M.Z.S., Sydney. 755 specimens, comprising 227 species and varieties of shells, with list. [The Secretary requested special attention to this very liberal donation, and read some extracts from a letter by the donor which accompanied it.]
9. From Mr. H. Gill. Sample of Tin Ore from the Star Claim, Cascade River, the first tin section found in the Upper Ringarooma District.
10. From Mr. Castles. Sample of Tin Ore from Schouten Island.
11. From Mr. H. Johnston. An Irish tenpenny piece, 1813.
12. From Capt. McDiarmid, brig Moa. Vertebra of a Whale. A Club from Island of Tanna.
13. From the Rev. H. D. Atkinson. A collection of type specimens of new shells, collected by the donor at Long Bay, and described by the Rev. J. E. Tenison-Woods. [In commenting on the value of this presentation, as type specimens, the Secretary read some remarks by the donor.]
14. From Mr. J. Bagley, Oatlands. A Tippet Grebe *(Podiceps australis)* shot on Lake Dulverton.
15. From J. Swan, Esq. Skin of Grey Flying Squirrel *(Belideus sciurus).*

[Mr. Swan remarked he had noticed this animal in localities so far apart from each other as Muddy Plains (near Launceston), the Lake Country and Avoca. Although by some observers it was thought to have been imported, he thought it was indigenous. Had it been brought to the country it would not, in so short a period, have spread so extensively from localities where it had not become too numerous for existence, and whence it had not been driven either by other animals, or by any deficiency of food or shelter.]

The Rev. W. W. Spicer read a paper on the effects of wounds on the human subject inflicted by the spur of the Platypus *(Ornithorhynchus anatinus).*

Mr. Justice Dobson related the particulars of another case of a very similar character, the subject of which had come under his notice about twelve days after the wound was received. Even then the man was in a very prostrate condition, presenting the appearance of having passed through a very serious illness.

Dr. E. L. Crowther mentioned he had seen a case some months ago in which the patient was almost killed by a wound (he thought on the hand) from the spur of a game cock. The pain from the injury was most acute. The injured limb became swollen, and for the space of twenty-four hours the amount of collapse was alarming.

The Secretary read the following note from Mr. T. Stephens on some specimens from the shaft lately sunk for coal at Spring Bay :—"Messrs. Robinson and Carter of Spring Bay have forwarded to me a case, now in the Museum, containing a complete series of specimens from the trial shaft at Triabunna, which, when arranged in a properly constructed 'section box,' will furnish a good illustration of that portion of the coal measures which was passed through in the recent exploration. I hoped to have submitted to the Royal Society a paper on this subject and on the general geological formation of the district, but have not been able to find sufficient leisure this year for such work. If, in past times, an accurate record had been kept of each section of the coal measures that has been tested in Tasmania, it would have saved the useless expenditure of thousands of pounds." In reference to some specimens from George's Bay, Mr. Stephens adds :—"Professor Liversidge, of Sydney, one of our Corresponding Members, has named for us some of the rarer minerals from the neighbourhood of George's Bay, which were exhibited at a former meeting of the Society, and has kindly expressed his willinguess to render a like service on any future occasion. To have such assistance from one of the most competent authorities in the colonies is an advantage which will be duly appreciated by the Royal Society."

The SECRETARY brought under notice a paper entitled "Synonymy of, and Remarks upon, Tasmanian and other Shells, with their Geographical Distribution." By John Brazier, C.M.Z.S., Corr. Member, Roy. Soc. Tas.

Mr. M. ALLPORT reported that a fine grilse, no doubt a true salmon, weighing upwards of four pounds, had been captured that morning close to the wharves, a striking proof of the vast numbers which must exist in the river and harbour.

The GOVERNOR stated he had examined the fish, which was a very fine one, and, he had no doubt, was a true *Salmo salar*. Passing to a subject somewhat allied to fish, His Excellency brought under observation the net which had been presented, and on comparing it with others in the Museum, commented on the general superiority of the workmanship of those in the northern over those in the southern regions of the Continent, including also Tasmania. Towards the north also the natives appear to have a much better idea of making canoes and catamarans. Before closing his remarks, the Governor begged to take that opportunity of saying he thought the best thanks of the Society were due to one of its Fellows—Mr. Russell Young, to the Ministers, and to Parliament for the action which had recently been taken in reserving a great portion, 3,700 acres, of Mount Wellington as a people's park. In his inaugural address he had dwelt strongly on the pressing necessity which existed for some such legislation as that which had just taken place. It was quite impossible to over-rate the benefit of the Act to the city, to the colony at large, and to visitors from the other colonies, to whom the beauties of this park will alway form an increasing attraction. It was pleasant also to think that such a magnificent estate was now secure for all time, not for the rich alone, but for the poor, for whom especially it must prove an incalculable boon and a highly civilising agent.

The SECRETARY brought forward the results of five additional years of meteorological observations carried on gratuitously at Hobart Town with the greatest zeal and industry by Mr. F. Abbott, compiled by Mr. Roblin, Curator of the Museum, thus completing a record extending over thirty-five consecutive years—a period probably unequalled by any other British colony. Abstract Tables and Results of Meteorological Observations taken at the Lighthouses and other Coast Stations in Tasmania during the years 1871, 2, 3, 4 and 5, compiled with much labour and care by Mr. Roblin were also submitted. The above will, as heretofore, be printed for distribution.

Mr. SWAN in proposing a vote of thanks to the donors of presentations (especially to Mr. Brazier), and to the Rev. W. W. Spicer for his interesting paper, observed, with some reference to the remarks of the Chairman, that a Committee has been appointed by Government for carrying out improvements in the Domain and that the work, as far as disposable labour would admit, would be commenced forthwith.

The SECRETARY mentioned that the Committee would have the great benefit of the advice of the Governor who had taken the greatest interest in the work and had promised to afford every practical assistance in his power.

The proceedings then terminated.

HISTORY OF AUSTRALIAN TERTIARY GEOLOGY.

By the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., Corr. Mem. Roy. Soc. Tas., and N. S. Wales.

[*Read* 11*th July*, 1876.]

The first person to call attention to the tertiary formations of Australia was Capt. Flinders, who, in his survey of the south coast in 1802, noticed the fossiliferous cliffs of the Australian Bight. He imagined them to have been derived from some vast coral reef. Tertiary geology as such was not then known. In 1829 Capt. Sturt traced down the Murray River, and in doing so came to a portion bounded on each side by high limestone cliffs, which were one mass of fossils, many of which converted into selenite. He identified some of those collected with European forms, and though in this he was mistaken, yet he was correct in designating the formation as tertiary. The subject then remained in abeyance, except from some cave remains sent home by Sir Thomas Mitchell, until 1859, when, encouraged by Sir Charles Lyell, who was in a great measure my instructor in geology, I prepared an account of the tertiary formation in South Australia, for the Geological Society, which was published by them. This was accompanied by a valuable notice of the Polyzoa and Foraminifera, by Professors Busk and Rupert Jones respectively. These investigations were followed by my work on the Geology of South Australia, in 1862, subsequent to which the regular reports of the Victorian Geological Survey have thrown a flood of light upon the whole subject. Professor McCoy has from time to time issued notices of some of the most interesting fossils and their affinities, while two parts of the "Decades" of the Museum have been dedicated to Palæontology, principally tertiary. Within the last ten years Professor Duncan, the illustrious President of the Geological Society, has steadily devoted himself to the elucidation of the Australian Tertiary Corals; while Professor Laube, in Vienna, has given equal attention to our fossil Echinodermata. The eminent palæontologist, Thomas Davidson, has taken our Brachiopoda in hand,—a work begun already by Robert Etheridge, jun., who has also, with Professor Duncan, added something to our knowledge of the Echinodermata.

It will be seen from this brief sketch that though the tertiary formations of Australia have occupied many minds, yet our progress, so far, has been somewhat slow. This is the more remarkable, as it has long been believed among scientific men that the development of Australian geology must reveal facts of the utmost importance to science generally. It has been remarked by some geologists that the present state of Australia is very similar to what Europe was immediately after the secondary or Mesozoic period. The position of Australia renders it less liable to an admixture of its species with those of other continents, and therefore its natural history is to a certain extent peculiar to itself. In the Flora the correspondence to the Mesozoic period is well marked. There the *Araucariæ*, so common in the secondary rocks, are represented; and these are only found in the Pacific Islands and Australia. There are the *Lamiæ* and *Arthrozamiæ* found only at the Cape of Good Hope and Australia, being closely allied to species found in secondary deposits.

With regard to the Mammalia, no indigenous animals have been found distinct from the Marsupialia except rodents, and one or two species about whose introduction doubts have been entertained. The rodents belong to an order which has many affinities with marsupials, and in one genus, *Phascolomys*, the characters are interchanged.

The following passage from Mantell's "Wonders of Geology" will show that the views of geologists on this subject were. Speaking of the Wealden strata, he says:—"Nor can we resist the conviction that not only did the same terrestrial area, however modified it must have been during the long succession of ages, supply the *débris* of an almost unchanged system of animal and vegetable life to the Jurassic seas at first, and subsequently to the Cretaceous ocean; but that, also, the fauna and flora of this ancient land of the secondary epoch *had many important features which now characterise Australia*. The Stonesfield marsupials and the Purbeck *Plagiaulax* are allied to genera now restricted to Australia and Tasmania, and it is a most interesting fact, as Professor Phillips was first to remark, that the *organic remains* with which these relics are associated *also correspond* with existing forms of the *Australian Continent* and neighbouring seas; for it is in those distant latitudes that the waters are inhabited by *Cestracions*, *Trigoniæ* and *Teribratulæ*, and that the dry land is clothed with *Araucariæ*, tree ferns, and cycadeous plants."

These facts, coupled with the circumstance that no true secondary rocks had been found in Australia, lent great force to the opinion that we had in Australia a continent which, having been dry land during the Mesozoic epoch and only a small portion of it since submerged, had preserved the fauna and flora of that time. But later investigations have shown that we possess on the continent nearly every leading representative of the secondary strata of Europe. In Western Australia, and in Southern Queensland, the lower and middle Mesozoic formations are largely represented; while in N.E. Australia and all around Carpentaria we have immense areas exclusively occupied with deposits which very closely represent the upper and lower Cretaceous with the Greensand of Europe.

The more advanced state of our knowledge places us now in a position to give a solution to many important questions which naturally arise. The first is whether the secondary forms show any remarkable divergence from the typical forms of that period. To this we may answer in the negative. In accordance with the general rule in geology that the lower we descend in time the wider the range of species and the closer the resemblances, we find a strong resemblance, and, perhaps, in some cases, an identity which enables us to say not only that the fossils are secondary, but, also, to what particular subdivision of the secondary rocks they belong. As a further illustration of the same rule, we find in our Palæozoic

(Devonian) rocks absolute specific identity with European forms, with rare exception.

This being the case, it becomes most interesting to ask, in the interests of the evolution theory, whether there are in our tertiary formations any signs of a persistence of the secondary types, so that their preservation, in the existing state of things, can be accounted for. To this, we must again answer "no." The secondary types in the tertiary rocks of Australia are few and rare. We have two *Trigoniæ*, both very different from the existing forms ; but one very similar to our Oolitic species, and a *Pleurotomaria*, which is a Palæozoic type ! Some of the Brachiopoda have faint secondary affinities, but the Echinodermata are certainly not Mesozoic in character. In all other respects our tertiary formations have very close affinities with the tertiary rocks of Europe, and, indeed, with the rest of the world ; while there is the same singular and remarkable break between the secondary and tertiary periods that is found to prevail everywhere. Imperfect and incomplete as the geological record must necessarily be when it is interrogated as to evidence in favour of evolution from what it gives in Australia, it must say decisively "in Australia I have none to give."

In this I am not putting any interpretation on the evidence. I am merely stating the fact. Whether another interpretation against evolution could be given is a matter of individual opinion, and I withhold my own. My researches in Australian tertiary geology have now extended over twenty years, and during that time, as I have helped somewhat to create its literature, I may say, probably without arrogance, that I have as good an opportunity of becoming acquainted with its palæontology as any one. It may be, therefore, of some value to state that in all my examinations of our fossil and living fauna I have carefully sought for any reasonable evidence in favour of evolution or clue to its mode of operation, and have found none—none whatever. I must add that Australian geology, whether reluctantly or not, must admit that she can urge nothing in favour of that theory being true, the true explanation of nature as we find it.

But in the supposition that in our land fauna and flora we have a relic of secondary epoch, there is something not easy to reconcile with the evolution hypothesis. Types remaining stationary during such long periods of time appear, to my imperfect knowledge of evolution, inconsistent with the necessary postulates. Possibly I may misunderstand the question, but it must be of use to point out that the evidence of the submergence of Australia since the Mesozoic period is somewhat cogent. Not only are relics of the Cainozoic strata found at considerable distances from the sea, but the northern as well as the southern portions of the continent are covered at intervals with a deposit which some regard as marine and some as lacustrine, but all agree in referring to the most recent of our tertiary strata. It would be, therefore, a hasty conclusion to assert that any part of the continent has been preserved as dry land since the Mesozoic period, and the weight of evidence is against it.

FURTHER NOTES ON THE TERTIARY MARINE BEDS OF TABLE CAPE.

BY R. M. JOHNSTON.

[*Read* 11*th July*, 1876.]

In a former paper upon the above subject, I confined my observations principally to the organisms themselves. Since that time I have visited Table Cape, and, assisted by Mr. T. R. Atkinson of this town, I have not only added to my collection a large number of new species, but have by careful investigation become possessed of important particulars which may be of some value in determining the relative position of this interesting deposit.

On approaching Wynyard from the sea, the eye is at first arrested by a bold basaltic headland, rising from the water at an angle of 45 degrees, to a height of about 500 feet. The bold outline and the characteristic level summit at once suggests the idea that the striking object before you must be the well-known Table Cape. On a nearer approach, two smaller rounded bluffs come into view, and are rendered conspicuous by the contrast which their white precipitous cliffs present, as compared with the wooded and sombre slopes of Table Cape proper. The two smaller bluffs are isolated from each other and from Table Cape by narrow valleys formed by erosion, while the larger valley or basin by which the river finds its course to the sea separates them from the little township of Wynyard. Notwithstanding the gaps between the bluffs, an ordinary observer can perceive at a glance that the stratified beds of the smaller ones were at one time continuous, and that the protecting cap of basalt at the same time spread in one continuous sheet over all the adjacent ridges. On closer examination it becomes evident that we have in these two solitary bluffs a small fragment of that raised sea bottom which, most probably, at a recent period connected Tasmania with the continent of Australia. At any rate it is most conclusive that we have in these stratified beds myriads of organisms which were during the tertiary period inhabitants of that vast shallow sea which then covered the greater part of Australia and Tasmania and separated the remaining portions into island groups.*

The bluff nearest to the township of Wynyard is about 160 feet high. The general strike is north and south, and the dip inclines about 5 degrees in a north-westerly direction ; and at this angle the beds disappear at sea level under the great basaltic promontory of Table Cape. As the series of beds

* See the Rev. J. E. Tenison-Woods' paper.

forming the deposit attains its greatest thickness in the bluff nearest to the township, and as the same relative characters are maintained at other places where the beds are exposed I have chosen this point as the most suitable for illustrative purposes. [The accompanying diagram will show the relative extent and position of the various beds.]

Conceive, therefore, a white, beetling sea-cliff, whose base is obscured by enormous blocks of sandstone which, by the ceaseless undermining action of the sea, have recently been dislodged from the various ledges high overhead.

Those restless sea waves by which they were originally formed are now at once engaged in their destruction, and in re-arranging out of the same materials a very similar set of sandstone beds in the quiet coves of the neighbourhood. Thus we have the work of destruction and construction carried on by the same agency, and although we may find in the new arrangement a certain parallelism with the older formation; yet there are differences at once striking and instructive. For example—while the particles of sand forming the original rock have only been subjected to a little more tear and wear, the included organisms are in every case wholly dissolved. It is true that the existing types of life which find a home and a grave in the new formation may have secreted in their tests the same elements which formerly entered into the composition of the tests of the organisms of the older formation, but the forms themselves are very different in appearance. Were the present sands consolidated and elevated into a series of cliffs corresponding to those which now exist along the shore, the most careful observation might fail to find any organism having its exact counterpart in the older formation. The characteristic shells—

Trigonia semi-undulata; Pectunculus laticostatus; Cucullea corioensis; C. cainozoica; Voluta anticingulata; V. weldi, etc., and the Polyzoa *Cellepora gambierensis; C. nummularia*; *C. hemispherica; C. spongiosa; Sàlicornaria sinuosa.*—Corals—*Plachotrochus deltoideus; P. elongatus, etc., etc.*, of the older formation, are not found in the new formation, whilst the characteristic shells of the latter—*Trigonia margaratacea; Waldheimia australis; Venus roborata; Phasianella australis; Nassa pauperata, Risella nana, etc., etc.*, are nowhere to be found in the beds of the former.

I shall now give a brief description of the various rock divisions of the section given in the diagram, and in following a downward order I shall offer such observations as may be necessary to impart to the members of this Society; some knowledge of the composit and relative extent of the various beds and their included organisms. My work in this particular is rendered comparatively easy by what is now being carried on by the Rev. J. E. Tenison-Woods, in classifying and describing the organisms themselves.

BASALTIC CAP *(a.)*

It is a singular feature connected with the older stratified rocks that, where exposed as cliffs, they are invariably capped with sheets of igneous rock. It would seem that where the soft stratified beds were unprotected by a capping of this sort they have been washed away entirely or eroded into valleys of which Fingal Valley may be taken as a type. This supposition would fully account for the vast districts of elevated table lands in Tasmania, everywhere terminating in precipitous bluffs. A corresponding feature on a smaller scale may be seen in connection with the stratified beds of tertiary age, of which the Table Cape beds form a striking example. It is probable that the deposit which forms the main subject of the paper would have been entirely wasted away long ere this time had it not been that during a late volcanic period it was covered with sheets of basalt and basaltic tuff. The bluff already mentioned is covered by a cap of basalt and basaltic tuff about 80 feet in thickness. This cap, though shown in diagram to be separate from corresponding caps in the neighbourhood must have, prior to the erosion of the valleys, formed with them one continuous sheet.

The basalt at the only place where a face is exposed is greatly decomposed, and at first sight it might be inferred that the basaltic capping might be the re-arranged *detritus* of a basalt older than the rock which it now reposes upon. This inference is however extremely improbable, inasmuch as there is not the slightest evidence to show that the cap has been the result of the re-distribution of older material. It may be remembered that in a former paper I described a similar cap of basalt, overlying the beds of lignite at Breadalbane.

As they presented a superficial resemblance I determined to subject them to analytical comparison, and for this purpose I sent specimens of the rocks in question to Professor Ulrich, of Melbourne, whose labours in connection with the rocks of Australia have obtained for him a wide-world reputation. After making sections of the rocks, and subjecting them to microscopic examination he thus writes with reference to the Table Cape basalt :—" The rock is somewhat similar to some of our recent basalts here, viz., it is essentially a feldspar basalt with very little augite ; lots of glass and magnetic titaniferous iron, and rendered porphyritic by abundant grains and crystals of olivine. It differs from the basalt of Breadalbane by that the latter contains abundance of augite in well developed crystals." "These mineral differences are however no criterion of age; for we have here genuine miocene basalts which can, mineralogically, not be distinguished from recent pliocene ones. If the feldspar were replaced by Nephelene or Leucite throughout a basalt sheet, we might perhaps be justified to declare the geological age, within certain limits, different from that of an adjoining feldspar basalt flow, but even in this instance great care is required, especially if conclusions are to be drawn as to the age of underlying rocks." Happily we have now a more reliable index to the age of the underlying rocks than may be obtained from the comparative analysis of the constituents of igneous rocks; it is, however, satisfactory that the learned professor's analysis tends to confirm the opinion which I formerly entertained, viz., that the protecting cap overlying the marine beds at Table Cape is *a recent basalt*, and very slightly differs from a similar flow which overspreads the lignites at Breadalbane.

In order to ascertain whether the intrusive rock, mentioned by Mr. Allport in connection with the Travertin at Geilston Bay, is of a similar character to the rocks at Breadalbane and Table Cape, Professor Ulrich has, in a letter to me, kindly volunteered to analyse any specimens from that quarter sent to him. For this purpose, Mr. Allport, on being applied to, at once procured and forwarded an interesting suite of specimens. It will be of great value to have an established relationship with the various basaltic rocks in Tasmania and Victoria. The rock known as the "older volcanic" in Victoria is very similar to the rock at Table Cape, and, like it, the "older volcanic" frequently caps the marine beds considered to belong to the miocene age.*

I regret that I could not find an accessible spot to ascertain whether the sandstone, upper bed, was altered at point of junction with the basalt or not. Perhaps some future observer may be more fortunate in this respect.

TURRITELLA GROUP (*b*.)

Following the descending order we come upon the group of beds which immediately underlie the basalt as already described. The group has been named by me in the diagram as the "Turritella Group," because the small shell, *T. warburtonii* (Tenison-Woods), so abounds through this particular formation as to give it a character which would be sufficiently distinctive when compared with the only other

* I have since been informed by Mr. Ulrich that the composition of the intrusive rock at Geilston Bay is similar to that at Breadalbane and Table Cape.

division of which the tertiary marine deposit at Table Cape is composed. The group is about 80 feet thick where fully exposed, and consists of a series of beds of white or gray calcareous sandstone, more or less firmly consolidated.

Although there are some of the beds in which scarcely any other organism can be seen but the Turritella already referred to; yet there are others in which organisms are extremely varied and abundant.

There are also bands frequently occurring throughout the group, some of them can be traced horizontally for about a mile perhaps, in which *Cellepora gambierensis* (Busk) seems to be particularly abundant.

So much does the latter organism appear to be abound in these bands, that I am of opinion that it is owing to the segregation of the carbonate of lime around this coral, that the great relative hardness cf these bands is due.

The other forms which give a character to these curious bands appear to be Echinodermata and Brachiopoda. Of six distinct species sent to the Rev. J. E. Tenison-Woods for diagnosis,the form resembling *Hemipatagus woodsii* (Etheridge) (so called after the learned gentleman just referred to) seems to be the most abundant. Among the seven species of Brachiopoda found, the most conspicuous is the fine shell, *Waldheimia gambierensis* (Tenison-Woods), also described from specimens supplied by the Rev. J. E. T. Woods, from Mount Gambier, South Australia. The most abundant, however, is a species of Terebratula, resembling a large *T. compta* (*Teribratella tenisoni*, Tenison-Woods).

In the less indurated sandstone beds, or between the bands already described, I have discovered 15 or 16 species of Polyzoa and Corals among which I have been able to recognise many of the Mount Gambier forms, described in "Observations on the Geology of South Australia" by the Rev. J. E. Tenison-Woods, viz., *Cellepora nummulina, C. spongiosa, Salicornaria sinuosa, Plachotrochus deltoides, P. elongatus? Flabellum victoriae? F. gambierense?* etc., etc.

As we approach the point of junction with the underlying division we come upon forms common to both divisions, and only distinguished by relative abundance, among which I may mention—*Typhis M'Coyi* (Tenison-Woods); *Voluta anticingulata* (M'Coy); *Ancillaria mucronata* (Sow); *Natica Wintlei* (Tenison-Woods); *Cucullea cainozoica* (Tenison-Woods); *C. Corioensis* (M'Coy); *Pectunculus laticostatus* (M'Coy) (Tenison-Woods); *Nucula tumida*, a small species of *Cardita;* a small species of *Myadora;* and two species of Pecten, one of them being an extremely minute species.

Altogether this group presents a facies so similar to that described by the Rev. J. E. Tenison-Woods, as belonging to the limestone beds of Mount Gambier, that the description of the latter would almost suffice for the Turritella Group of Table Cape, e.g., in page 75, *Geo. So. Austral.*, the following description of the Mount Gambier beds is given—"It is here seen that in addition to a distinct line of stratification, dividing the rock into layers about fourteen feet thick, there are regular zones where particular fossils are associated. Thus, at the first bed (fourteen feet) little is seen but *Bryozoa* and *Terebratulae;* in ten feet next, less of the moss corals, and mere Pectens; the next is almost exclusively composed of a Pecten common to this formation with imbricated striæ called *Pecten coarctatus*, and a cellopore coral subsequently to be described (*C. gambierensis*). This state of things is nearly continued to the bottom, where Echini and Reteporæ combine with the general mass." Had the learned author added that the small shell *Turritella warburtonii* was found in great abundance throughout the mass I should have supposed that he was giving an exact description of the Turritella Group at Table Cape.

THE CRASSATELLA BED.

We come next to the lowest division of the marine deposit. For itself as a rock it hardly deserves to be considered as separate from the Turritella Group, which rests immediately upon it, were it not for the fact that it appears to have been accumulated under different circumstances. The nature and relative abundance of the organisms contained in it also give a character which though most probably brought about by local circumstances is yet most peculiar and sufficiently distinctive. In making a distinction, therefore, between the Turritella Group (b.) and the Crassatella Bed (c.), it is not to be understood that the forms of the lower are nowhere to be found in the higher, and *vice versa.* All that is meant by the distinction is that the characteristic shells of the lower bed or division suddenly diminish in quantity as we enter the higher group and as we ascend even these gradually disappear.

We also observe that certain forms, especially Corallines and Terebratulæ, abundantly appear in the upper beds in bands, which were rarely seen or altogether absent from the lower.

The Crassatella bed is extremely variable in thickness, for in some places it attains a thickness of three and four feet, while at other places it is reduced to a mere band of 3 and 4 inches thick. Everywhere throughout, however, it preserves a uniform character.

I have named it in this paper the *Crassatella Bed*, because this organism belongs almost exclusively to it, and in some places it is so abundant that it forms distinct layers. The bed itself may be said to be composed of an irregular agglomeration of shells bound up in a matrix of ferruginous looking mud.

This substance is very fine and soft, and seems to have a wonderful preservative property, for many of the shells invested by it have not only the fine enamel preserved but in many cases the gelatinous epidermal membrane of a species of Pecten (possibly *P. coarctatus* ?), as perfect as though it still contained the living animal.

In this mud I have also found grit and rounded pebbles of a yellowish quartz very abundant. The fine yellow muddy substance is itself principally composed of the comminuted remains of various species of foraminiferæ. Perfect forms of the latter are, however, abundant, among which I have noticed various species of *Rotalia*, *Marginulina*, and *Textularia*. I intend, at some future time, to study these microscopic forms more carefully.

Although the exposed face of this shelly rock is extremely hard, yet when masses of the rock are detached they are found to be extremely friable, and with ordinary care the most delicate shells may be easily extracted. Unfortunately many of the latter are already so fractured in the rock that when separated from the matrix they fall to pieces. There are numerous small caves hollowed out of this rock by the waves of the sea at high tide—along the Sandstone Cave, and it is from the roof of some of these caves that some of the most interesting species of shells have been obtained. The greater number of species have also been obtained from this bed. As their number is so large I have prepared a complete list in a tabular form in another place.* It is only necessary to state here the names of those species, which from their extraordinary size and abundance, give a distinctive character to this small but interesting division, viz.—

*Typhis m'coyi (Woods).

Cyprea platypyga (M'Coy) Murex eyrei, Fusus roblini. *Spondylus.

Cyprea platyrhynca (M'Coy) *Cassidaria reticulospira, Pectunculus laticostatus (Lamarck).

Cyprea archeri (Woods), Cassis sufflatus (Tenison-Woods), Cucullea corioensis (M'Coy).

Voluta anticingulata (M'Coy), Lyonsia agnewi (Tenison-Woods).

*Trivia europea, Voluta hannafordia (M'Coy), Crassatella oblonga (Tenison-Woods).

* See Tabular List.

Voluta weldii (Tenison-Woods).
Ancillaria mucronata, Venus allporti (Tenison-Woods).
Venus cainozoica (Tenison-Woods).
*Trochita calyptræformis, Desh.
*Crepidula.
*Fissurella.
*Emarginula transenna (Tenison-Woods).
Turritella sturtii (Tenison-Woods), n.s.
Turritella warburtoni, ditto, n.s.
Columbella oxleyi, ditto, n.s.
Marginella wentworthii, ditto, n.s.
Delphinula tetragonostoma, ditto, n.s.
Zizyphinus blaxlandi, ditto, n.s.
Margarita kekwickii, ditto, n.s.
Tenagodus occlusus, ditto, n.s.
Pleurotoma johnstonii, ditto, n.s.
Astralium (Calcar) flindersii, ditto, n.s.
Astralium (Calcar) ornatissimum, ditto, n.s.
Lima squamosa, ditto, n.s.
Cardita gracilicostata, ditto, n.s.
Chione propinqua, ditto, n.s.
Nucula tumida, ditto, n.s.
Leda cerebrecostata, ditto, n.s.
Cucullea cainozoica, ditto, n.s.
Terebra additoides, ditto, n.s.

It is also important to notice the occurrence of fossil wood greatly decomposed in this deposit, and occasionally the teeth of two species of shark which had a world-wide distribution during the tertiary period, viz., *Lamna elegans*, *Charcharodon angustidens* (Ag.)†

Of the latter Professor McCoy writes :—" The present species, even as originally restricted by Agassiz, is one of the most abundant and characteristic miocene tertiary fossils of every part of Europe and America in which strata of this age exist, and I recognised it amongst the Australian beds to which I assigned miocene and oligocene with great astonishment, from this evidence of its world-wide distribution in the tertiary period."

CONGLOMERATE *(d.)*, AND SLATE *(e.)*

The rock forming the floor upon which the marine deposit at Table Cape has been thrown down is a highly indurated conglomerate. It presents a very irregular outline, and forms

* New species not yet described.
† Discovered by A. Willis, Esq., Wynyard.

all the numerous dangerous reefs between Table Cape and Emu Bay.

I am of opinion that this is the same conglomerate which crops out on the *Dial Range*, and which is assigned by Mr. Gould to Silurian age. It is composed of highly altered water-worn pebbles derived from various ancient rocks. Some of them are derived from a dark crystalline limestone, which appears to be non-fossiliferous.

One remarkable block, however, was, so far as I could learn, picked out of this conglomerate by Mr. James Smith, of Westwood, Forth. It is highly fossiliferous, the prevailing form, as shown in various sections, is undoubtedly a species of Brachiopod. I have not sufficiently studied this rock. I have observed, however, that it has been greatly subjected to denudation, and that it rests, so far as I could see, unconformably upon a more or less inclined slate rock.

GENERAL.

I have thus referred as briefly as possible to the vertical distribution of the organisms contained in the tertiary marine beds at Table Cape. It is of the utmost importance, prior to establishing any relations with similar isolated deposits elsewhere in Tasmania, Flinders Island, or the continent of Australia* that each isolated bed or series of beds should be fully investigated, especially as regards the extent and distribution of its organic contents.

While I do not deny that reasonable inference or conjecture, so long as it is recognised as provisional, is most useful in stimulating enquiry and helps to make interesting what would otherwise be a chaos of isolated observations, yet as the tendency to create minor subdivisions with reference to distant European beds, is in many instances too apparent, it may be the means of introducing much error into our classification.

Among recent geological authorities of eminence, perhaps, no one has drawn more particular attention to this source of error than the late respected Mr. Jukes.

In connection with chronological observation he thus writes (p. 409, manual). "In order to avoid error each great district of the earth, such as Europe or North America should be surveyed separately, without reference to anything out of the district, and that the order of superposition of its strata and their classification into groups or formations, should be settled independently on evidence to be found in the district only. When this has been done the two series may be compared, and the synchronism of different parts of each may be decided on."

If such care be necessary in the determination of the great

* See table.

classes themselves, it is surely more necessary to be careful in our classification of the isolated beds of a system into subdivisions, when we take into consideration the horizontal distribution of organisms as affected by migration of colonies, physicial barriers and local influences.

As an example of classification which might ignore the effect of migration of species, it is interesting to notice that although the shell *Pectunculus laticostatus* (Lamarck)* so abundant in the lower shell bed at Table Cape, is not now found living near the shores of Australia or Tasmania, it still exists in abundance on the coast of the distant colony of New Zealand. It is possible that this shell had a wider distribution during the tertiary period; but if there be evidence to the contrary, it is probable that change of circumstances have caused the species to migrate from its original centre, and that the great distance of our coast from the shores of New Zealand, represent horizontally or in space, the long duration of time necessary for the slow migratory progress of such an organism.

Take again the following instance :—

In the Turritella† limestone of Flinders Island, there occurs three species of shells also common to Table Cape deposit; one of them being the shell so abundant at the latter place. *Cucullea cainozoica* (Tenison-Woods.) Had an observer only reported the discovery of these three forms, without reference to their abundance or associated organisms, it would be a reasonable enough inference, so far as evidence went, that they belonged to the same sub-division. But as I have fuller evidence which informs me that, with the exception of the organisms already referred to, the characteristic shells of Flinders Island, though there very numerous, had never been detected in the beds of Table Cape. This knowledge, taken in conjunction with the consideration that the latter beds have now been very fully investigated, is sufficient to postpone the final co-relation of these deposits until the other isolated formations, of a similar character, afford some additional clue to their exact position.

As an example of local distribution in the same bed at Table Cape, I noticed, especially that *Cylichna arachis* (Quoy) though very common at one particular point, could be found nowhere else in the same horizon or indeed anywhere else. This is another important consideration when comparisons

* At Table Cape this shell has invariably 29 radial ribs, not 39 as figured and described by Prof. McCoy in the Victorian Decades.

† A very different species to that which characterises the Turritella group at Table Cape.

are sought to be made with various isolated deposits widely separated.

Generally, horizontal extension of a particular species from its orignal centre may represent a period of time during which vast deposits may have accumulated, vertically, on the original habitat, where each succeeding layer, perhaps, shewed a gradual extinction of the older forms, and the introduction of a new class of organisms. Thus, for example, could we depress the present group of tertiary beds at Table Cape so that the marine beds now in process of formation rested conformably upon them; a vertical section would show such a complete change in the character of the various beds as to justify the local geologist in sub-dividing his section into separate groups with, locally speaking, well marked characters. At the same time could we follow the horizontal movement of organisms as they gradually disappeared from the original centre, we would yet find in a very far distant part of the earth's surface, that amid all the vicissitudes of migratory change, a few persistent forms of the lowest stratum of the original centre would still be found to be the true contemporaries of those new forms which gave a complete change of character to the upper beds.

It follows from considerations of this nature that the existence of a few specific forms common to two or more widely separated deposits, is, in itself, no guarantee that they belong to the same subdivision of a great class; or even to the great class division itself.

Such being the case we should accept with the greatest caution the subdivisions of the various widely separated tertiary marine deposits of Victoria into *Oligocene*, *Miocene*, and *Pliocene*, until we know more fully the extent and quality of the evidence which forms the basis of their classification.

It also follows that until we have worked up independently and fully each deposit of the tertiary period, and also compared them with a fully worked up list of existing forms in the same neighbourhood, any attempt at classification will be premature and misleading.

Being deeply impressed with the importance of such considerations I have most carefully gone into the investigation of our Table Cape marine deposit, and I have been rewarded in the discovery of the remains of at least 150 distinct specific organisms. When the great number of new species are described and classified by the Rev. J. E. Tenison-Woods, to whom science in Tasmania is already so deeply indebted, we shall then be in a better position to compare with similar deposits elsewhere and with the existing forms in our own neighbourhood. But it is not enough to have our own deposits worked up with care. It will be useless to make comparisons with the deposits of Victoria or New South Wales without the co-operation of the naturalists and geologists of Australia generally.

This might be most effectually brought about by appeals to the various learned societies in Australia and New Zealand to make exchanges with us and to send catalogues of their classified fossils, with descriptions of habitat and distribution.

For this object I have arranged the marine fossils at Table Cape into a tabular form, which not only shows at a glance the distribution, so far as known, throughout the Australian deposits, but also, by signs, is made to show the relative abundance of each particular organism. Were the various learned societies to aid in classifying their fossils in a similar way, we would then be able to dispel all doubts with regard to the present classification. Co-operation, therefore, is at the present time of the utmost necessity, and I trust that the members of the Royal Society of Tasmania will take the initiative in a work so desirable and of such importance.

NOTE.—In the table the following signs are used :—† Not yet described, or being examined for description by the Rev. J. E. Tenison-Woods. *a*, common ; *b*, abundant ; *c*, very abundant ; *x*, not uncommon ; *y*, rare ; *z*, very rare ; *l*, still living.

The following also occur in abundance at Table Cape :—

CORALS.

Heliastrea cainozoica (Tenison-Woods), Table Cape.

Balanophyllia australiensis (Duncan), Table Cape, and S.A.

Ditto nov sp., Table Cape.

Trochoseris Woodsi (Duncan), South Australia.

Conotrochus McCoyi (Duncan) Table Cape and South Australia.

Ditto nov. sp, Table Cape.

Sphenotrochus excisus (Duncan) Table Cape.

Antillia lens (Duncan), Table Cape.

Placotrochus elongatus (Duncan), Table Cape and Mount Gambier.

Ditto deltoideus (Duncan) ditto.

Caryophyllia viola (Duncan), Table Cape.

Dendrophyllia Duncani (Tenison-Woods).Table Cape.

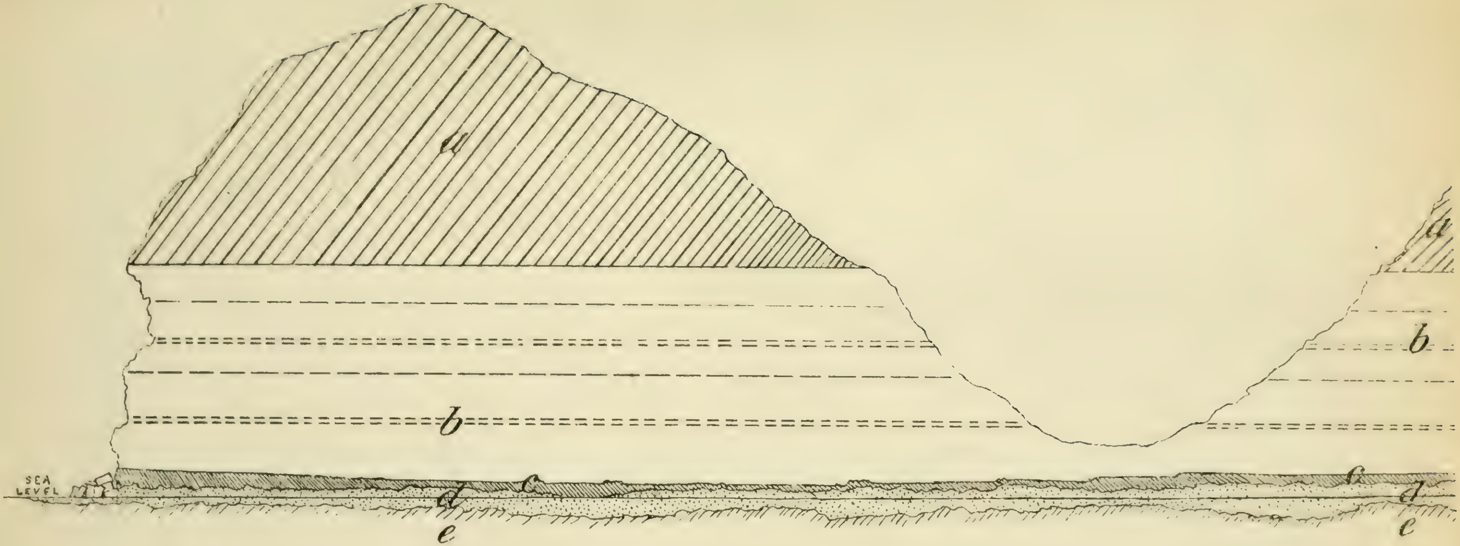
Flabellum Duncani (Tenison-Woods), Table Cape.

Ditto victoriæ, Table Cape and South Australia.

Ditto gambierensis, ditto.

POLYZOA.

Cellepora gambierensis (Busk)	Table Cape	and Mount Gambier.
Ditto spongiosa	,,	,,
Ditto nummularia	,,	,,
Ditto hemispherica	,,	,,
Pustutipora ramosa (Tenison-Woods)	,,	,,
Buskia typica	,,	,,
Retepora sp.	,,	,,



SECTION SHOWING POSITION OF TERTIARY MARINE BEDS AT SANDY COVE BLUFF, TABLE CAPE.

a.	Cap of recent basaltic *tuff* and *wacke* ...	80 feet
b.	Group of beds composed of calcareous sandstone, in which a small species of Turritelli (*T. Warburtonii*, Woods) abounds. Bands also frequently appear, containing abundant remains of corals, echinoderms, and brachiopods...	78 feet
c.	Crassatella bed ...	80 feet
d.	Metamorphosed conglomerate ...	——
e.	Highly inclined micaceous slate ...	——

COMPARATIVE TABLE SHOWING DISTRIBUTION OF AUSTRALIAN MARINE TERTIARY SHELLS, ETC.

	Tasmania		*Flinders Isld. Group.*				*Victoria.*															*S. Aus.*		*W. Aus.*		*Species Still Existing.*	
NAME OF SPECIES.	Table Cape	Ten miles south Cape Grim.	Turritella Limestone Heathy Valley	Oyster Bed, River Arthur	Hummock Island	Cameron's Inlet	Flemington	Mornington	Corio Bay	Birds Rock Point, Geelong	Mordialloc	Mt. Eliza	Mt. Martha	Schnapper Point	Moorabool (Maude)	Mth. Gellibrand Rv.	Fyan's Ford	Mouth of Lakes, Gippsland	Muddy Creek, Hamilton	Jemmy's Point		Mount Gambier	Aldinga Beds			In Tasmania	Elsewhere.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ASTEROPODA.																											
ex eyrei, enison-Woods	x																		c								
ɪs Mereditha, tto	c																										
o Roblini, ditto	z																		c								
o Johnstonii, tto	z																										
o Tateana, tto	c																										
o, ditto	z																										
o, ditto	z																										
.o, ditto				c																							
o transenna, tto	z																										
on Abbotti, tto	b																		c								
o minimum, tto	c																										
cinum fragile, tto	c																										
phon ditto, itto	c																										
ainella lyræcostata, ditto	a																										
to cancellata, itto	a																										
ala marginata, itto	z																										
ssa ditto, ditto				c																							
ebra additoides itto	c																										
to simplex, ditto	y																										
sis sufflatus, itto	z																										
to (?)	c																		c								
sidaria reticuospira, M'Coy	x																										
rnola bifasciata 'enison Woods	z																										
tæon scrobiculatus, ditto	c																										
umbella oxleyi, itto	x																										
to cainozoica, itto	x																										
urotoma Johntonii, ditto	y																		c								
tto paracantha, litto	a													c					c								
tto sandleroides, litto	z																										
tto pullulascens, litto	x																										
tto (?)	z														c												
tto (?)	z														c												
tto (?)															c												

NAME OF SPECIES.	Tasmania		Flinders Isld. Group.				Victoria.															S. Aus.		W. Aus.		Species Sti[ll] Existing.	
	Table Cape	Ten miles south Cape Grim	Turritella Limestone Heathy Valley	Oyster Bed, River Arthur	Hummock Island	Cameron's Inlet	Flemington	Mornington	Corio Bay	Birds Rock Point, Geelong	Mordialloc	Mt. Eliza	Mt. Martha	Schnapper Point	Moorabool (Maude)	Mth. Gellibrand Rv.	Fyan's Ford	Mouth of Lakes, Gippsland	Muddy Creek, Hamilton	Jemmy's Point		Mount Gambier	Aldinga Beds			In Tasmania	Elsewhe[re]
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
GASTEROPODA—*continued.*																											
Pleurotoma (?)															*c*												
Ditto (?)	*z*																										
Ditto (?)	*z*																										
Ditto (?)	*z*																										
Ditto (?)	*z*																										
Ancillaria mucronata, Sow.	*c*																										Doubtfu[l]
Voluta Hannafordii, M'Coy	*x*											*y*	*y*						*c*								
Ditto, ditto	*z*																										
Ditto anticingulata, ditto	*c*									*b*									*c*								
Ditto antiscalaris, ditto	*c*												*x*						*c*								
Ditto Weldii, Tenison-Woods	*c*																		*c*								
Ditto macroptera, M'Coy	*a*										*x*								*c*								
Ditto granatina, Swainson	*z*																										
Ditto M'Coyi, Tenisón-Woods	*z*																										
Ditto, ditto	*z*																										
Ditto, ditto	*z*																										
Ditto, ditto	*a*																										
Ditto, ditto	*a*																										
Marginella Wentworthi, ditto	*c*																										
Ditto strombiformis, ditto	*c*																										
Ditto octopticata, ditto	*z*																										
Ditto, ditto	*z*																										
Cypræa (Aricia) gigas, M'Coy												*y*															
Ditto platypyga, ditto												*z*															
Ditto platyryncha, ditto	*a*									*x*																	
Ditto gastroplax, ditto												*y* *b*	*b*														
Ditto eximia	*y*																										
Ditto Archeri, Tenison-Woods	*c*																										
*Ditto (Trivia) europea, Montfort	*z*																										Britain
Ditto arellanoides, M'Coy									*y*			*a*	*a*						*c*								
Ditto, ditto	*z*																										
Daphnella columbelloides, Tenison-Woods	*z*																										
Ditto tenuisculpta, ditto	*a*																										
Ditto gracillima, ditto	*c*																										
Mangelia gracilirata, ditto	*c*																										

NAME OF SPECIES.	Tasmania: Table Cape	Tasmania: Ten miles south Cape Grim	Flinders Isld. Group: Turritella Limestone Heathy Valley	Flinders Isld. Group: Oyster Bed, River Arthur	Flinders Isld. Group: Hummock Island	Flinders Isld. Group: Cameron's Inlet	Victoria: Flemington	Victoria: Mornington	Victoria: Corio Bay	Victoria: Birds Rock Point, Geelong	Victoria: Mordialloc	Victoria: Mt. Eliza	Victoria: Mt. Martha	Victoria: Schnapper Point	Victoria: Mooraboool (Maude)	Victoria: Mth. Gellibrand Rv.	Victoria: Fyan's Ford	Victoria: Mouth of Lakes, Gippsland	Victoria: Muddy Creek, Hamilton	Victoria: Jemmy's Point	Victoria	S. Aus.: Mount Gambier	S. Aus.: Aldinga Beds	W. Aus.	W. Aus.	Species Still Existing: In Tasmania	Species Still Existing: Elsewhere.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
STEROPODA—*continued.*																											
ica Wintlei, enison-Woods	c																		c								
o vixumbilita, ditto	z																										
o polita, ditto	c																									l	Bruni Isld.
o, ditto	x																										
bonilla, lyræstata, ditto	x																										
o pagoda, ditto	x																										
o, ditto	x																										
o, ditto				c																							
amidella Rorti, ditto																											
tium				c																							
limella subuta, Donov.	z																										Europe
thium Flemgtonensis, 'Coy							c																				
o	c																										
o	c																										
o	c																										
thiopsis Johnonii, Tenisonoods	z																										
caria?	z																										
ritella Tasmana, Tenisonoods	c																										
o Sturtii, ditto	c																										
o Warburtoni, tto	c																										
o, ditto	c																										
o, ditto	c																										
o, ditto	c																										
o, ditto			c																								
o, ditto			c																								
metus conohe-c, ditto	x																										
o, ditto	x																										
o, ditto	x																										
agodus occlus, ditto	c																										
oa Stevensiana tto	c																										
oina varicifera, nison-Woods	c																										
o	a																										
oTateana, ditto	c																										
o Johnstoni, tto	c																										
o				c																							
o				c																							
o				c																							
oo Etheridgii, tto	c																										
perator (Astralium imperi-s)	y																										NewZealand
thus Josephi, nison-Woods	y																										

	Tasmania.		Flinders Isld Group.				Victoria.															S. Aus.		W. Aus.		Species Stil Existing.	
NAME OF SPECIES.	Table Cape	Ten miles south Cape Grim	Turritella Limestone Heathy Valley	Oyster Bed, River Arthur	Hummock Island	Cameron's Inlet	Flemington	Mornington	Corio Bay	Birds Rock Point, Geelong	Mordialloc	Mt. Eliza	Mt. Martha	Schnapper Point	Moorabool (Maude)	Mth. Gellibrand Rv.	Fyan's Ford	Mouth of Lakes, Gippslard	Muddy Creek, Hamilton	Jemmy's Point		Mount Gambier	Aldinga Beds			In Tasmania	Elsewhe
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
GASTEROPODA—*continued.*																											
Thalotia alternata, Tenison-Woods	*y*																										
Gibbula crassigranosa, ditto	*b*																										
Ditto Clarkei, ditto	*x*																										
Ditto æquisulcata, ditto	*x*																										
Astralium (Calcar) Flindersii, ditto	*c*																		*c*								
Astralium (Calcar) ornatissimum, Tenison-Woods	*y*																		*c*								
Margarita Keckwickii, ditto	*c*																										
Zizyphinus blaxlandi, ditto	*y*																										
Delphinula tetragonostoma, ditto	*z*																										
*Liotia tasmanica, ditto	*z*																										
*Ditto discoidea, ditto	*z*																										
Ditto lamellosa, ditto	*z*																										
Solarium (Torinia) gibbuloides, ditto	*x*																										
Fissurella concatenata, ditto	*z*																										
Emarginula. transenna, ditto	*z*																										
Crepidula lævis, ditto	*z*																										
Trochita	*c*																										
Cylichna arachis (Quoy)	*c*																										Australi Tasmar
Humphreyia, ditto	*x*																										
Dentalium Kicksii Nyst.	*c*																		*c*								
Ditto lacteum (?) Deshayes	*a*																		*c*								Indian O.
BRACHIOPODA.																											
Terebratulina Davidsoni, A. Etheridge																						*b*					
Ditto, Tenison-Woods	*c*																										
Ditto, ditto	*z*																										
Waldhemia Garibaldiana, Davidson																											
Ditto Tayleri, ditto																						*b*					
Ditto gambierensis ditto	*b*																					*b*					
Ditto, ditto (?)	*x*																					*b*					
Ditto, ditto (?)	*z*																										
Ditto, ditto (?)	*z*																										
Terebratella compta, Sow.																											
Rhynconella lucida M'Coy	*c*																					*b*					

NAME OR SPECIES.	*Tasmania*		*Flinders Isld. Group.*				*Victoria.*															*S. Aus.*		*W. Aus.*		*Special Still Existing.*	
	Table Cape	Ten miles south Cape Grim	Turritella Limestone Heathy Valley	Oyster Bed, River Arthur	Hummock Island	Cameron's Inlet	Flemington	Mornington	Corio Bay	Birds Rock Point, Geelong	Mordialloc	Mt. Eliza	Mt. Martha	Schnapper Point	Moorabool (Maude)	Mth. Gellibrand Rv.	Fyan's Ford	Mouth of Lakes, Gippsland	Muddy Creek, Hamilton	Jemmy's Point		Mount Gambier	Aldinga Beds			In Tasmania	Elsewhere.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ONCHIFERA.																											
ea	c																										
o	z																										
.o				c																							
na Bassi, Tenison-Woods	c																										
squamosa, amark																											
tto subauricuta, Montf.	x																										
atula (?)	x																										
ndylus	y																										
.o	y																										
ullea corioensis .'Coy	c																										
.o cainozoica, enison-Woods	c																										
a	y																										
tto, ditto	y																									c	
ctunculus latistatus	c																		c								NewZealand
uopsis Belcheri, roc.	z																										Cape
to aurita, ditto																											Deep seas
ula tumida, enison-Woods	c																										
a crebricostata tto	c																										
ma lamellifera, tto	c																										
ius Allporti, tto	a																										
to (Chione) pronqua, ditto	c																										
to cainozoica, tto	c																										
o, ditto (?)	z																										
.o, ditto (?)	z																										
lita gracilicosta, Tenison-Woods	c																										
to (?), ditto	y																										
lium (?)	c																										
o ?	c																										
satella oblonga enison-Woods	c																										
o aphrodina, tto	y																										
ina cainozoica, itto	c																										
curtus Leandi, ditto	x																										
nsia Agnewi, tto	c																										
dora (?)	y																										
.o ?	c																										
onia acuticosta, M'Coy																											
o semiunduta, ditto	c																										
.o Howittii, tto																											
ella ?	z																										

NAME OF SPECIES.	Tasmania		Flinders Isld. Group.				Victoria.														S. Aus.		W. Aus.		Species Still Existing.	
	Table Cape	Ten miles south Cape Grim	Turritella Limestone Heathy Valley	Oyster Bed, River Arthur	Hummock Island	Cameron's Inlet	Flemington	Mornington	Corio Bay	Birds Rock Point, Geelong	Mordialloc	Mt. Eliza	Mt. Martha	Schnapper Point	Moorabool (Maude)	Mth. Gellibrand Rv.	Fyan's Ford	Mouth of Lakes, Gippsland	Muddy Creek, Hamilton.	Jemmy's Point		Mount Gambier	Aldinga Beds			In Tasmania	Elsewhere
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
CONCHIFERA—*continued.*																											
Balanus	z																										
Aturia zic-zac, var. australis, M'Coy																											
ECHINODERMS.																											
Micraster brevistella																						c					
Ditto ditto, var.	a																										
Hemipatagus Forbesi, Woods and Duncan																											
Ditto Woodsi, R. Etheridge																											
Ditto ditto, var. cordiform, &c.	c																										
Ditto (?)	z																										
Ditto (?)	x																										
Cidaris (?)	x																										
POLYZOA AND CORALS.																											
Cellipora gambierensis																											

NOTES ON THE FOSSILS REFERRED TO IN THE FOREGOING PAPER.

By the Rev. J. E. Tenison-Woods, F.G.S., &c.

[*Read* 11*th July*, 1876.

Since I last described some of the Table Cape fossils existing in the Museum of the Royal Society the collection has been very much enlarged, owing to the indefatigable exertions of the author of the preceding paper, Mr. R. M. Johnston. From this collection I have been enabled to determine upwards of eighty new species, the greater part of which are new to science. About ten per cent. of these are still existing, some few in the same seas, some in the Northern Hemisphere, in subtropical regions or in European seas. Knowing as we do now, from deep sea dredging the wide diffusion of species until recently regarded as local, we must not be surprised at the result, nor should we be surprised if a still larger number of our living shells are found common to European seas and our own. Ten per cent. can hardly be finally regarded as the proportion of surviving forms, because our knowledge of the existing fauna is so imperfect. Some of the fossil shells I never saw living until very lately, and should have described them as extinct had not living specimens been recently discovered. Such instances are, however, like the species themselves—extremely rare. *Natica polita* and *Fissurella concatenata* are cases in point. They had been described there as extinct and only very recently discovered living specimens. *Trivia europea* and *Eulimella subulata* are European forms, which I believe occur at Table Cape as fossils.

I have already described the nature of the formation. I may add that it is evidently a deposit belonging to the Laminarian zone. This I gather from the entire absence of truly littoral shells, and the presence in abundance of Rissoidæ, etc., which feed on sea weed at depths, of from eighty to one hundred fathoms. Foraminifera are numerous and indicative of the same depths as well as corals among which are true reef builders, *Heliastræa tasmaniensis*, Duncan; *Thamnastræa tasmaniensis*, Dunc.; and *T. sera*. Dunc., which are rather abundant. They are the only ones hitherto found in the Australian tertiaries. I have been able to determine a new Placotrochus, and a very peculiarly branched Dendrophylla. The Brachiopoda are abundant, and tend to confirm the evidence of the depth at which these beds were deposited. Several new species are under the consideration of Mr. Thomas Davidson—our greatest living authority—and, doubtless, will soon be described.

The Echinodermata are numerous and present some new forms. They are all considerably distorted by pressure. Nothing, however, of very great novelty has hitherto been found, and all the species bear the strongest resemblance to those of the Malta Miocene.

Polyzoa are scarce, and in this respect the Table Cape beds present a remarkable contrast to those of a similar horizon in Australia. This is accounted for by the nature of the beds which are composed of a levigated mud, mingled with coarse pebbles of quartz and feldspar, and all highly ferruginous. They were either derived from the detritus of submarine craters, or the wearing down of volcanic rocks in a sea, not tranquil, but containing strong oceanic currents These conditions are very unfavourable to the growth of polyzoa.

Though some of the shells, as far as yet known, are peculiar to the Table Cape beds, and many of the corals; yet the majority of the fossils are identical with those of the Australian so-called Miocene and undoubtedly belonging to the same sea. To show what differences have arisen since the period, I may mention that there is a much closer resemblance between the fossils of Table Cape and those of Southern Australia, than there is between the shells found upon the same coasts now, that is to say, that the two places had more species in common formerly than than they have now, and, though of course the differences even now are not very great, yet they are more evident than they were. It should be remarked, however, that *now* the existing shells for comparison are littoral, but *then* they were a continuous deep sea, and whereas we know the littoral species, we do not know the deeper sea ones.

It is certain that as we go back in geological periods we find a greater similarity extending over wide spread areas, until in the early formations, where absolute identity is the rule in the most remote parts of the earth's surface. Thus the Devonian fossils of Tasmania are, with few exceptions, specifically identical with those of Europe. Professor

McCoy has pointed out another curious fact in our Australian palæontology, which is, that though in our early tertiary formations we have little specific identity with European fossils, yet we have shells in some instances so closely resembling them as to be mimetic, and no more than just specifically distinct. As far as my examinations go this I find to be rather the exception than the rule, and in most cases I looked in vain for even a general resemblance between our fossils and those which may be presumed to be of the same horizon in Europe.

The following are the new species brought to light by Mr. Johnston. Note.—All dimensions in French millimetres.

Murex eyrei. n. s. Shell fusiformly ovate with a rather depressed spire, lamellose and spiny, last whorl three-fourths the whole length of shell, sharply angulate rather above the middle and furnished with eight thick lamellose frilled varices which at the angle become projected into blunt hollow short somewhat recurved spines. About the fourth from the aperture the varices lose their lamellose character, and become lirate ribs, still preserving the spines at the angle, above which the shell slopes upwards to the suture at a slight inclination on which the varices are represented by smooth lamellar raised lines; the spiral whorls, four in number, have the angle spinous, and but little raised above the suture; apex obtuse; aperture ovate; outer lip produced at the angle and terminating anteriorly in a long straight canal; inner lip reflected with a conspicuously raised foliaceous rib, spirally sloping to the siphonal aperture. Long. 48, lat. 32. Last whorl from posterior margin of mouth, 34; length of canal, 17.

Cassis sufflatus. n.s. Shell thin, shining, globosely inflated with simple or subplicate whorls, spire short almost acute; whorls 6, $2\frac{1}{2}$ apical, naticiform, three next distinctly cancellate with a fine subnodose carina above; last angulate below the suture, between which and the angle there is a shallow broad finely bimargined groove; below this the shell is somewhat finely and indistinctly tuberculate and ribbed, the ribs showing a faint lower band of tubercles near the middle of the whorl, below this the shell is smooth or very finely striate; aperture auriform, outer lip reflexed, rounded, thickened and much produced anteriorly; inner, a mere enamelling above and passing as a thin septum over the round abruptly twisted, short siphonal canal, causing a broad spiral groove like an umbilicus to pass behind the labio. Long. 37, lat. 23. Long. apert., 26, lat 12, mil.

Though very distinct there is an approach to the Australian types *C. paucirugis and C. semigranosa*, which are now found on our coasts.

Fusus tateana. n. s. Shell ovately fusiform with the apex curved, and a rather long, narrow, straight canal; whorls 8, roundly convex, smooth, the upper and obliquely curved ones obscurely tubercled, and all more or less marked with flexuous, slightly raised lines of growth; suture well defined but not deep, rather sloping; aperture regularly elliptic, smooth, outer lip thin and roundly curved into the anterior canal, which is narrow and straight; base slightly concave. Length, 81; lat., 35; aperture, 30, anterior canal, 20, but often broken and evidently continued at least 5 mil. further where its width would be scarcely 5 mil. Common.

The constantly curved apex, the slightly tubercled spire while the rest of the shell is so conspicuously smooth renders this form peculiar and distinct. Among living Australian forms there is nothing at all like it, while with the fossil tertiary species of Europe its analogies are remote. I have great pleasure in dedicating the species to Professor Tate, of the Adelaide University, who has done such service to molluscan science by his numerous conchological works, but especially in the revised edition of "Woodward's Manual."

Fusus transenna. n. s. I name this shell provisionally as the only specimen sent to me has the apex and lip broken. It is ovately fusiform with sharp spire, and scarcely rounded whorls, which are completely, equally, rather distinctly latticed, with transverse and spiral liræ, which are subnodose at the intersection, there are about 24 longitudinal ones in the body whorls, but this number is uncertain, as they become confused to some extent with the striæ of growth, and there are 10 spiral ones on the body whorl reckoned at the back of the columella. The body whorl is also subangulate above, and there concave to the suture, which is rendered almost marginate by small granulations at the end of the liræ. The outer lip appears to be thin, the columella slightly twisted, the aperture oval, with a long sub-oblique posterior sub-recurved canal. Long. 22, lat. 11, aperture with canal, 12, lat. 4.

Fusus johnstonii. n. s. Shell very small, narrowly fusiform, apex smooth, elongate, of two whorls, the upper being the most swollen; whorls 7, very convex in the middle with 8-9 very prominent broad rounded ribs; conspicuously marked, with very numerous spiral liræ which alternate, large and small, and pass over the ribs; longitudinally finely striated but not so conspicuously as lirate, so that the whorls could scarcely be called cancellate, suture deeply impressed, aperture narrowly ovate, canal prolonged, outer lip thin, columella simple, with the lip slightly enamelled, and the liræ descending obliquely from behind it. Long. 8, lat. scarcely 3 mill.

A form slightly aproaching *F. Swartzii*, Hörnes, of the Vienna basin, but in that species the canal is recurved, and the liræ sub-squamate.

VOLUTA M'COYI. n. s. Shell narrowly ovate, thin, smooth, shining, with a small obtuse naticiform apex; whorls slightly convex and oblique with no other marks than the lines of growth, aperture 1-3rd larger than the spire, acute posteriorly and gradually widening to the anterior notch, which is broad and scarcely recurved, columella with four high oblique plaits. Long. 30, lat. 11, aperture long. 18, lat. 5.

TEREBRA ADDITOIDES. n. s. Shell very acute—lanceolately turretted, somewhat solid, closely longitudinally ribbed and finely transversely striate, ribs rounded, ivory like and smooth, interrupted above by a rather broad shallow groove in which they are slightly deflected, but not entirely obliterated, above becoming almost nodular; interstices broad, slightly concave, shining, equally and closely striate, which disappears on the ribs, suture sharply and deeply impressed; whorls 13, ribs nodular in 7th to 11th, two spiral whorls, rugose only; apex decollate; mouth ovate, almost channelled near suture; inner lip reflected over columella, which is twisted into four to six rugose folds, sloping down to the siphonal notch. Long. 24, lat. 5.

In this fossil the groove on the ribs and general form brings it near to the Tasmanian *T. addita* and *T. kieneri*, but the whorls are closer and more numerous. It has a general resemblance to the Australian members of the genus. It is very close to certain European miocene forms, notably *T. pertusa* Bast., and *T. basteroti* Nyst (formerly called *T. duplicata* by Brocchi, by mistake identified with Linné's shell of that name), but from these it differs in being a smaller narrower shell, and in the ribs being more numerous and finer.

ASTRALIUM (CALCAR) FLINDERSII. n. s. Shell solid, trochiform, not umbilicated, spire somewhat elevated, granular and spiny; whorls six, furnished at the base with lamellar imbricated folds in the form of short spines, above which are five spiral unequal lines of round granulations, the uppermost of which are the largest; last whorl angular; suture a broad and deep groove with a line of granulations within; aperture subcircular; columella flattened and concave; outer lip angled and channelled at the base; base flat with many spiral granular or imbricated liræ. Alt. 17, diameter 13 mil. The short spines and the coarsely granular liræ easly distinguish this species.

Astralium (calcar) ornatissimum. Shell very solid, rounded obliquely, and globosely conical, whorls five, rounded and ornamented below with a marginal rib of close granulations; above this a very fine line of granules, above this a projecting conspicuous spiral line of lamellar imbricating spinous folds, and crowned above by a spiral line of coarse round nodules; aperture circular, outer lip with an exterior angle and canal; columella curved, scarcely flattened; base concave above with four spiral granular ribs. Alt. 17, diam. 13.

Delphinula tetragonostoma. n.s. Shell small, obliquely turbinate, latticed, whorls four, swollen, with three keels and 8-9 spiral liræ, which are united to each other by small close diagonal riblets, making complete lattice-work all over the test; apex obtuse, depressed; aperture round, outer lip quadrangulate, with a distinct channel at each angle; inner lip reflected over the umbilicus, on the outside of which is a salient conspicuous marginal rib which joins the aperture at the anterior angle; base convex and latticed. Long. 2; lat. $3\frac{1}{2}$ mil.

This very small Delphinula has some relation with our latticed Tasmanian *Liotias*, but is very distinct in every other way.

Zizyphinus blaxlandii. n.s. Shell small, conical, stained purplish in colour, spirally ribbed and transversely diagonally finely striate; whorls 7, flattened above and surmounted by a broad canaliculate spiral groove, which is diagonally finely striate; spiral ribs, four on each whorl, and separated from each other by equal grooves, which have 3-4 spiral liræ and diagonal striæ; penultimate whorls very finely coronate above with almost imperceptible elevation of the margin, these become more distinct on the next whorl above, and then are regular granulations on the two next; the two apical whorls are smooth; on the penultimate whorl and base the transverse striæ are raised, but faint, with a tendency to be in pairs; on the antipenultimate they are wrinkled and distinct; mouth sub-quadrate; outer lip thin; columella with a faint umbilicus behind, margined by a thick spiral rib. Long. 5, lat. 4, mil. Named after one of the first explorers who crossed the blue mountains. This fossil is not allied to any existing species in these seas, though slightly resembling a Philippine form.

Liotia lamellosa. n. s. Shell small, orbicular, subdiscoid, apex flattened, and depressed, four to five longitudinal keels, which are not very prominent, and equally, distinctly lamellosely costate with overlapping undulating ribs, between which the whole shell is closely and finely striate, umbilicus broad, deep, and finely crenulated by the endings of the lamellæ, aperture round, with a thin varix. Diam., 3 mill.

This form which, though decidedly similar to many Australian forms, is distinct from any yet described. Quite recently I have seen in the collection of Mr. W. F. Petterd, a specimen dredged from the Tasmanian coast, so that the species is still living.

Margarita kekwickii. n.s. Shell small, thin, broadly globosely conical, deeply umbilicate; spirally lirate and shining; whorls seven, rapidly decreasing in size, rounded and equally spirally lirate with alternating large and small fine liræ, the larger ones sharp, and the lowest projecting a little, forming a groove over the suture, the smaller microscopic, and not visible above the basal and penultimate whorl; aperture round, peristome almost meeting on base, outer lip thin; columella curved and thin, umbilicus acutely margined and with curved ribs at right angles to spiral liræ. Long. and lat. 5. Named after my late friend the overseer of Stuart, the great explorer, who accompanied him on all his expeditions, and was one of the most courageous and indefatigable of his followers. The fossil has no known living congener in Tasmania.

Trochus josephi. n. s. Shell very small, broadly pyramidal with a small, smooth, white, rounded apex of $1\frac{1}{2}$ whorls; spire conspicuously latticed; whorls 6-7, with three conspicuously keels, the lowest projecting much over the suture; keels closely latticed regularly by somewhat broader sub-distant sloping ribs which seem to pass under the keels, and to cause them to become nodular as the point of intersection, in addition the whole shell is very finely striate; base flat, with numerous spiral alternating liræ; aperture subquadrate, simple, entire. Long. 3, width of base, 2.

Thalotia alternata. n. s. Shell turbinately conical, spire elevated, acute; whorls six, very slightly convex, granulosely ribbed; on the last whorl the spiral ribs are twelve in number, three conspicuous and largely granulose, and the rest with small sometimes sharp edged grains or reduced to fine lines; they are disposed thus—each granulose rib has fine liræ at each side of it, and the large and small ribs alternate; suture inconspicuous, base convex, rounded at the periphery, with spiral granulose ribs and fine liræ regularly alternating; aperture obliquely quadrate, nacreous, outer lip thin, smooth inside; columella s ightly twisted with an obsolete tubercle at the base. Lon. 12, lat. 10.

Not like any of our existing Thalotias.

Solarium (Torinia) gibbuloides. n. s. Shell thick, sub-turbinate, rugose, spire somewhat elevated; whorls 4-5 angulated tuberculately coronate above and conspicuously keeled, keel thin, finely granular with irregular lines of rather larger granules above it; apex smooth, and turbinate for 1½ whorls, base very much produced by the spiral, sharp, smooth, edge of the umbilicus, and handsomely ornamented with spiral granular lines, and undulating subsquamose striæ, which are also found above the carina and between the granules on the body whorl; aperture orbicular, outer lip produced and everted posteriorly, and narrowed into a fine short canal anteriorly, inner lip acute, curved, umbilicus, keeled. in the centre, very concave, and distinctly undulately striate. Diam. 8, alt. 7.

This form which departs in many respects from the typical Solarium has some affinity to *S. turbinoides*, Nyst, and *S. trochiforme*, Desh. of the French and English Eocene deposits.

Gibbula crassigranosa. n. s. Shell solid, thick, rugose, turbinately conical, apex obtuse, depressed, smooth, whorls 5-6, coronate with slightly oblique rounded ribs, extending to a sharp granulose carina, in the middle, below they have a conspicuous spiral groove to the suture on which is a line of very fine granules; base sharply angular, slightly convex with spiral lines of fine and coarse granules; aperture, orbicular, nacreous, columella produced into an anterior angle. Long. 14, Lat 11. Young specimens have numerous oblique longitudinal lines of growth, and are umbilicated. At the dimensions given there are about 16 costæ on the last whorl.

Gibbula æquisulcata. n. s. Shell orbiculately turbinate, sub-depressed, thick, apex acute; whorls 5-6, rapidly but regularly increasing, rounded, spirally finely regularly grooved, and very closely lirate and regularly cancellate with extremely fine diagonal striæ; aperture orbicular, smooth, outer lip finely crenulate, inner lip arcuate with slight anterior angle; deeply narrowly perspectively umbilicate; periphery rounded, base convex, marked like the whorls. Diam. 12, alt. 9, Lat. of apert. 6. Rare. The carinæ between the grooves are sharp and very distinct from the much finer liræ with which the whole shell is marked, on the last whorl where they are crossed by the diagonal striæ they become granular.

Except that this is a more depressed and smaller shell, it has considerable affinity with *Trochus patulus*, Bron. of the Vienna Miocene. The description, however, as given by Nyst. Coq. Foss. p. 383, makes this a more angular shell in Belgian formations.

Turbo etheridgei. n.s. Shell turbinately conical, solid, granular, grooved, spire rather elevated and acute, whorls 6-7, convex, conspicuously carinated with 5-7 elevated sub-distant, largely granular spiral ridges, interstices closely, finely, but very distinctly, obliquely striated with striæ which pass over the ridges and sometimes even over the raised rounded often polished granulations; aperture orbicular, nacreous and smooth; columella simple, not tuberculate, base convex and spirally granular. Sometimes the interstices between the ribs have a fine sharp raised keel in the midst. Long. 17, Lat. 12½. Common, but nearly always broken.

I have dedicated this shell to Mr. Robert Etheridge, jun., F.G.S., a distinguished palæontologist and geologist, formerly connected with the Victorian Geological Survey.

SYRNOLA BIFASCIATA. Tenison Woods. This species which is described by me in last year's Transactions of the Society has been forwarded by Mr. Johnston as found fossil at Table Cape.

TURRITELLA WARBURTONII. n. s. Shell small, shining, *narrowly* pyramidal, spirally ribbed and (microscopically) transversely closely undulately striate, *two smooth* conspicuous ribs at the lower part of each whorl, with others very fine and of varying size above; *whorls* 8-10, *flattened*, slightly swollen above; suture narrow and deeply depressed, apex always decollated, base flattened, almost concave, with 8-10 fine spiral ribs which alternate large and small, outer lip thin, inner lip *not reflected*, mouth quadrate, columella simple. Long. 6, Lat. 2.

I have marked the difference between this and the preceding species in *italics*. In addition it is a much smaller shell. Table Cape. Common.

TURRITELLA STURTII. n.s. Shell small, acutely pyramidal, spirally granulosely ribbed; ribs 7-8 in each whorl, three conspicuous and prominent, the others intermediate, small non-granulose, and of varying size. Whorls ten, constricted at the suture which is deeply impressed. Base flattened with 7-8 spiral equal sized ribs, covered with numerous very fine transverse striæ; mouth subquadrate, outer lip thin, inner lip much reflected over the base, columella simple, and slightly reflected at the base. The three prominent ribs on the whorls are all granular, the larger two at the base of the whorl, and the third above and separated by a wide interval in which the smaller ribs occur. Granules on lowest prominent rib separated from each other by oblique grooving, and below this rib a deep channel above the suture; apex always decollated. Long. 12, lat. 4 mil.

This fossil is of a type common enough in the genus, which may be said to vary in individuals by the disposition of the three prominent ribs. It has remote resemblance to some living Australian species. Its small size and remarkable granulations distinguish it. Very common at Table Cape, and in the Australian Lower Cainozoic, Muddy Creek, Corio Bay, etc. In the Museum there is a large block of yellow calcareous sandstone from Table Cape, principally composed of this fossil, with an almost complete skeleton of a small marsupial herbivore imbedded. (Macropus or Helmaturus ?)

Tenagodus occlusus. n.s. Shell loosely twisted, the three apical whorls in contact, the fourth slightly detached, and sloping, the last largely unfolding, making a loose turn two and a half times the length of the remainder; whorls solid, wrinkled or detaching upper shelly coat in flakes, underneath which it is still thick, cracked, smooth, and somewhat polished, rounded below but narrowing and almost angular at the cleft, which is a smooth slit without punctures closed for its whole length, and evidently almost filled up by lamellar calcareous matter down to the aperture where it is little more than a shallow notch, pyriform and projecting below, apex disciform, apical whorl vermiform and fine pointed. Length, 56 lat., aperture 8 mil.

The absence of foramina and the almost closed slit distinguish this from all known Australian forms. The cleft is much more narrow and inconspicuous than the size of the shell would lead one to suspect, and its being reduced to a notch in the aperture. It is supposed that the slit is left open for the purpose of bathing the gill which lines the left side of the mantle, which, in this animal, is divided. It cannot, however, be so necessary where the aperture slopes forward from the notch. The slit is not, in this case, entirely closed, for the tube, when broken below it, separates at once at the fissure, and shows a fine delicate edge at the point of junction.

Vermetus conohelix. n. s. Tube adhering, corrugated, coiled, lower whorls, laterally depressed into a ridge and coiled upon each other with a truncated flattened hollow cone of two whorls, at the apex the tube becomes free, obliquely erect, flexuous and cylindrical, aperture somewhat thick and orbicular. Height of cone, 3; breadth, 6; length of free end, 5; aperture, 1, mill. wide.

I am unacquainted with any form like this either in Australian seas or elsewhere, as far as I can gather from O. Mörch's extensive lists.

Rissoa stevensiana. n.s. Shell minute, narrowly pyramidal, nucleus somewhat suddenly contracted of two smooth turbinate whorls, spire slightly tumid in the middle; whorls ten, angular or sub-carinate in the middle, coarsely costate, from 12-16 ribs on each whorl, and finely but indistinctly lirate, ribs rounded, not much elevated and continuous from suture to suture, the latter very deeply impressed so as to give the whorls a rounded swollen aspect; base almost flat, aperture pyriform entire, 1 5th length of shell; columella simple. Long. 3, Lat. 1 mil.

RISSOINA VARICIFERA. n.s. Shell minute, smooth shining, tumid, apex somewhat contracted, of two whorls, smooth, and was previously whiter than the spire; whorls 6-7, flattened, but rounded above, suture deeply impressed, aperture rounded, much smaller than penultimate whorl, outer lip slightly produced, inner lip reflected over the base, generally a continuous line of swollen conspicuous varices on the columella side of the whole shell. Long. 3, Lat. scarcely one mill., but this is the largest size.

A form approaching somewhat the *R. costulata*, Grat. of the European tertiaries, but smaller and with a rounded contracted aperture. The varices are not always visible. I believe this form still exists in Tasmanian seas.

RISSOINA JOHNSTONI. n.s. Shell minute, rather broadly pyramidal turretted, apex smooth, white, shining, of two smooth turbinated whorls; spire $2\frac{1}{2}$ length of aperture; whorls 9-10, sloping, rather convex, obtusely carinated in the middle, more or less longitudinally plicate, with 6-12 ribs (which are in some specimens very faint, and others almost varicose) and spirally lirate with 6-8 valid liræ, which often alternate in size; suture well impressed; aperture suborbicular outer lip somewhat produced, thin; column slightly twisted, and everted below; base concave and spirally lirate. Long. $31\frac{1}{2}$, Lat. $1\frac{1}{3}$.

Very common. In this species the ribs do not follow each other in a regular series, but seem rather to alternate, those of each succeeding whorl rising from the interstices between the ribs of the ones below. It has no living representative in Australia. Its Bittium-like form distinguishes it from any other species known to me.

TURBONILLA PAGODA. n.s Shell minute, narrowly pyramidal, apex a swollen elongated kind of pullus of two smooth whorls, spire flattened turriculate, whorls 9, rising in stages or slightly overlapping; ribs 12-16 rounded, raised, in a continuous sloping series, broader than the interstices; no visible transverse markings, base smooth, slightly convex, aperture oblong, squared above, rounded below, columella twisted. Long. $4\frac{1}{2}$. Lat. 1 mil.

In this genus determinate characters are not easily specified. The above fossil may, perhaps, be best distinguished by its size, sloping ribs, smooth base, twisted columella, and the whorls rising in stages.

TURBONILLA LIRÆCOSTATA. n.s. Shell elongate, narrowly pyramidal, nucleus of two smooth turns, apex blunt, whorls (without nucleus) 8, flattened, with 20-24 straight round ribs which continue unaltered (though sometimes slightly flexucus) from suture to suture; interstices not so wide as the ribs, and very closely spirally grooved, which sometimes pass over the ribs; base roundly convex and spirally lirate, suture submarginate, aperture broadly ovate, outer lip thin, columella slightly arched, canal short, very slightly recurved. Long. $5\frac{1}{2}$, Lat. $1\frac{1}{2}$.

Eulimella subulata. Donovan. *(Nat. Hist. Brit. Shells, vol.* 5, *t.* 173—1799 *as Turbo.)* This shell, which is very fully described and figured by Hörnes, Nyst, Wood, and others, as Eulima, would come under Prof. Forbes genus of Eulimella. It has received a host of names during the last 77 years of its scientific life. I can see no difference whatever between the specimens found at Table Cape and those found existing in the British seas. It is extensively known as European Miocene and Pliocene fossil. Not common. Two specimens forwarded by R. M. Johnston, one by — Stephens, many found by myself at Muddy Creek, Victoria, Mordialloc, etc. It has not yet been found living in Australia, unless some only closely allied forms of Eulima should be identified with it.

Actæon scrobiculatus. n.s. Shell oblong, ovate, solid, apex acute, smooth only at the extreme summit, whorls 7, cancellate with very distinct spiral liræ, much finer longitudinal striæ; interstices rounded or punctate, liræ on the last whorl broad and subdivided by a fine groove, longitudinal striæ subdistant (so that the interstices are transversely oblong) and passing occasionally over the liræ, so as to make them subgranular, especially at the anterior margin; aperture subauriform, posteriorly acutely attenuate, peristome anteriorly everted and recurved, plait conspicuous, solid, obtuse. Long. 12, Lat. 6, apert. 6.

A form very closely allied to the *A. pinguis*, D'Orb., of the European Miocene, from which it differs in the narrower form, the character of the plait, the anteriorly produced mouth and everted lips. It has no Tasmanian nor Southern Australian congener.

Cylichna arachis. Quoy. Still living in Tasmania and Australia, and not uncommon in the Table Cape beds.

Liotia discoidea. Reeve Zool. Prov., 1844. Living in Tasmania and extending to Philippines; somewhat small in the fossil state and rare.

Fissurella concatenata. Crosse. Shell thin, oval, laterally and anteriorly depressed, tumid posteriorly, irregularly concentrically ridged with lines of growth, and covered all over with fine hexagonal depressions which grow broader from apex to margin; foramen oval, with a conspicuous tubercle on each side, and widely margined beneath, interior margin enamelled, and above which the shell is undulately striate or subcorrugated to the foraminal margin. Long. 14, Lat. 10, alt. $2\frac{1}{2}$ mil. Easily distinguished by its hexagonal markings, in which it differs from any described. This shell was described by H. Crosse, in the Jour. de Conchy, in 1864 but the fossil forms are generally thinner and fragile, and more like the variety found near Sydney.

Emarginula transenna. n.s. Shell thick, small, oblong, subquadrate posteriorly, end slightly produced, conical, high, apex submarginal, smooth, acute, recurved, parallel with the margin, anterior surface ventricose, posterior concave, latticed; radiating ribs 23, high, between them smaller ones which often in descending give rise to still smaller; transverse ribs raised, but always more sunk than the radiate, and at all the points of intersection, very projecting granules, interstices very deep and square, fissure slightly longer than width, margin denticulate, straight. Long. 11, Lat. 6, alt. 6. Fissure, Long. $1\frac{1}{4}$ mill., Lat. $\frac{1}{2}$ mill.

There are many fossil Emarginulas, some descending as low as the Inf. Oolite, though most of them are tertiary. The above description, detailed though it may seem, would apply to many species unless particular attention is paid to the relative dimensions. It is very near the existing Arctic (?) *E. fissura*, Lamk., but narrower, and less high in proportion to length. It is not unlike the *E. clathratæformis*, Eichw. (Vienna Miocene) but that has a sinuous margin, and the apex is incurved and marginal. I doubt very much if our fossil is distinct from what Mr. Angas names *E. dilecta* of South Australia and N. S. Wales, but which is very distinct from *E. dilecta* of A. Adams (Proc. Zool. Soc. 1851, p. 85), which comes from King George's Sound. The latter is very *depressed* with deep fissure.

Pleurotoma. This genus, which is very largely represented in the tertiary deposits of Europe, and in the existing fauna is not numerically a large genus in Australian or New Zealand tertiaries, and in this it accords with the existing state of things. Out of over 400 living species (divided into many genera and subgenera) Australia has scarcely 30, and out of nearly 400 fossil species the tertiary beds of Australia and New Zealand have not so far yielded a dozen well defined. The genus is mainly characterised by the deep cut or sinus in the outer lip. In this and in the form of the shell there is every variety. I draw attention to two important characters which distinguish the *sinus*, which seems of value in the identification of species. Sometimes it is close to the suture, either as a mere notch or narrow slit, or it is at some distance from it. 1st. On a keel which becomes nodose, granular or imbricately squamose. Or, 2nd. By the side of the keel, next the suture, or outside. On this particular the striation and ornamentation I have found depend very much. For convenience also we may divide the genus into :—1. Plicate, or ribbed. 2. Spirally keeled. 3. Plicate and keeled. Each division may also be subdivided thus :—A. Spire longer than the body whorl. B. Body whorl longer than the spire. In New Zealand the plicate division is represented best. Eleven fossil species are known, two of which are living, and there are four living forms in the same seas, and one which Captain Hutton refers to *Daphnella*, the *Drillia* (*Mangelia*) *letourneuxiana* of Crosse. It does not correspond with the Daphnella genus referred to here. We find in the Australian tertiaries none of those mitræ like forms of Europe such as *P. ramosa*, Bast., neither is the style of ornamentation that of *P. granulocincta*, Münst, *P. Schreibersii*, Hörn. The shells are simply granular, and not often ribbed as far as they have been examined.

Pleurotoma pullulascens. n.s. Shell small, slender, rather solid, fusiformly turretted, spire nearly twice exceeding body whorl, apex naticiform shining, smooth of $1\frac{1}{2}$ turns ; whorls (exclusive of apex) 5, angular, equally, distantly, spirally lirate ; upper ones subplicate with rounded undulating ribs ; all finely long, undulately striate ; suture with a distinct margin much broader than the liræ ; sinus a rather deep broad crescentic bend, occupying all the space between the angle of the whorls and the suture, which is slightly sloping, lirate and very distinctly striate with the lines of growth ; aperture sub ovate, outer lip simple ; inner lip thickened distinct, enamelled ; canal short, not recurved. Long. 8, Lat. $2\frac{1}{2}$.

This is a form which closely allied to *P. crispata*, San. (cited by Hörnes as agreeing with *Murex turricula*, Brocchi, and *P. turrella*, *Reineri*, *Basteroti*, *Tarentini*, of other authors) the differences being that is smaller, the canal is not contorted, and the granular apex. There is no known form like it existing on our coasts.

Pleurotoma sandleroides. n.s. Shell small, somewhat solid acutely fusiform, turretted, spire twice longer than body whorl, apex naticiform, smooth shining ; whorls 7, rounded, accurately, closely, diagonally plicate ; liræ solid, smooth, shining, 8-12 in a whorl ; sinus deep and conspicous, aperture narrow much contracted anteriorly, canal short, outer lip thin, and curved so as to appear thickened and conspicuous, columella slightly twisted, base spirally striate. Long. $7\frac{1}{2}$, Lat. 2.

A form approaching *P. Sandleri*, Partsch. (Vienna basin Miocene and in habit also resembling *P. costellaria*, Nyst (*Rech. coq. foss. Hosselt et Kl.*, *p.* 31) but smaller and more slender than either. Much approaching in character many of an existing Australian Mangelias, with which it would probably be associated by many naturalists. I prefer to keep it with the Pleurotomas because of the very conspicuous sinus which is also margined, the margin extending remarkably on the body whorl. The number and size of the half ribs varies in different specimens.

Pleurotoma paracantha. n.s. Shell fusiformly turretted, spire pyramidal acute, and nearly twice as long as the aperture; spirally equidistantly lirate, with an angle and a spiral row of tubercles about the upper third of the body whorls, and the lower part of those of the spire; finely longitudinally undulately striate with the lines of growth in which the profound broad rounded sinus of the outer lip is very conspicuous upon the keel; interstices between the liræ with 3-4 fine lirulæ, tubercles on the carina sometimes broad and sharp-edged, sometimes white, round, enamelled and projecting almost like spines, mouth pyriform, outer lip acute, thin, inner lip defined, slightly enamelled; canal short, almost truncate, base strongly and finely in the interstices, spirally lirate, and almost cancellate behind the columella. Long. 33, Lat. 13. Not common at Table Cape. A very distinct form having some relations with *P. cataphracta* (*Murex c.* Brocchi Conch. foss. subap. Tom. 11, p. 427) and *P. turbida*, Lamarck, Hist. an. s. vert. Vol. 7, p. 97, which is the *P. colon* of Hörn, and *P. crassata* of Nyst, Coq. foss. de Belg. p. 511. That shell has the spire short in proportion to the whole length of the shell.

Daphnella columbelloides. n.s. Shell small, fusiform sub-turretted, rather solid, and much the aspect of a columbella, whorls seven apical ones margined at the suture, and ribbed with rounded smooth oblique ribs, 8-12 in each whorl; penultimate, and last whorl smooth, margined at the suture; aperture long and narrowly fusiform, rounded posteriorly; outer lip and columella simple and truncate. The lines of the sinus only visible with a lens, rather recurved than deep. Long. 12, Lat. 5. Not common.

Pleurotoma johnstonii. n.s. Shell fusiformly turretted, solid, apex acute, transversely striate, and finely, undulately, longitudinally, striate (whorls 11, with 3 spiral ribs below (the middle one most prominent), forming a tumidity above the suture, which is distinct but not impressed, above which the former fissure marks form almost nodular crescentic markings above these the lines of growth curve forward to the summit, and are crossed by regular equidistant fine liræ; apex very acute; aperture elongately fusiform, and prolonged below into a rather long straight canal; outer lip thin, with a broad, deep incision ($2\frac{1}{2}$ mil. broad, and 2 deep); columella broadly enamelled. Long. 38, Lat. 12.

Daphnella gracillima. n.s. Shell fusiform, thin, fragile, shining, whorls 6, gracefully sloping, last longer than the spire, finely striate lengthwise with irregular ridges of growth which become fine, close, and rounded at the lip; regularly and somewhat distantly grooved with rather broad, flat, shallow, conspicuously striate grooves, one of which is much broader just below the suture, which is distinctly canaliculate; apex obtuse, and natica like; mouth narrow, finely rounded at the suture; outer lip thin; canal short; base of the pillar finely and obliquely decussate behind. Long. 21, Lat. $7\frac{1}{2}$. Aperture, Long. 13, Lat. 3 mil.

This shell is very closely allied to *D. ornata*, Hinds, of the Philippines. It is very common in Table Cape. Fourteen specimens were collected by Mr. Johnston.

Daphnella tenuisculpta. n.s. Shell fusiformly ovate, rather solid, aperture a little longer than the spire, apex naticiform, depressed, smooth, shining, whorls 6, rounded, slightly concave and narrow, grooved near the suture, everywhere very finely and closely cancellated, acutely undulately ribbed; ribs broader than the liræ (which pass over them), regular oblique, close on the whorls of the spire, only slightly interrupted by the groove, and becoming an obliquely subgranular on a margin round the suture. On the body whorl irregular, fine and undulating, 24 in number; aperture pyriform, attenuate at each end; outer lip thin, columella smooth, canal somewhat short and truncate. On the basal whorl the spiral liræ alternate, large and small,' while the longitudinal ones are much finer throughout. Long. 17, Lat. 8. Common.

Mangelia gracililirata. n.s. Elegantly fusiform turretted; aperture about $\frac{1}{3}$ length of spire, apex obtuse, smooth, almost turbinate for $3\frac{1}{2}$ whorls; the latter (apex included) 9, convex, everywhere very finely lirate, liræ alternating regularly large and small and obliquely plicate; plaits 18, in penultimate whorl, 23 in last becoming obsolete anteriorly Mouth elliptical, outer lip varicose, produced in the middle, sinus inconspicuous; columella grooved slightly; canal short, truncate. In larger and older specimens the former mouth leaves a distinct varix on the body whorl, half a turn form the lip. Long. 13, Lat. 5. Specimens much smaller than this are found, but without the varix.

This most remarkable fossil with its peculiar apex and varix is distinct from any living or fossil known to me, though if I mistake not there are Mesozoic forms not unlike it. I call attention to the fact of the smooth almost turbinate apex which most of the Pleurotoma family had in the Australian cainozoic period. In this respect they seem to be distinguished at once from living forms and European tertiary fossils.

Buccinum fragile. n.s. Shell ovately fusiform, turretted, extremely thin and fragile, spire acute, apex naticiform of two whorls; the whole shell lirate with raised liræ which are alternately large and small, and about three on each whorl become nodose keels. These are cancellated by much finer longitudinal lines; whorls 6-7, rather globosely convex, and angulate above, the upper ones with solid ribs, which disappear on the body whorl which is multicarinate, suture deeply impressed, but not canaliculate; aperture broadly ovate, outer lip very thin, with a smooth inner margin, within which there rises a number of small, raised, polished liræ which have a tendency to run in pairs; columella short, and spirally much twisted, but not enamelled; canal short, and scarcely reflected. Long. 17, Lat. 10. Long. of aperture, 8, Lat. 5.

This is a very common fossil and widely distributed as I have seen it taken from most of the Lower Tertiary beds of Australia. It has many representatives of its peculiar type among European tertiary fossils, but none living or fossil of such a fragile character which gives it a marked specific distinction. *B. tenerum*, Sow., is a very fragile form of *B. undatum* found in the Eocene beds of England and Belgium, but in that well-known and much larger species the shape is different, and the whorls obliquely ribbed.

Triton minimum. n.s. Shell small, somewhat solid, ovate, with a naticiform obtuse, smooth, white shining apex of nearly four whorls; whorls 7-8, with numerous raised rather broad liræ, sometimes alternating large and small; interstices about twice as wide, and closely, elegantly, striate at right angles with very fine lines, which do not appear to pass over the spiral liræ; spire regularly costate near the apex, the plait disappearing for the two last whorls, though some of the liræ are slightly nodular; varices much raised and lirate; mouth broadly oval, outer lip projecting beyond the varix and undulate, prominently dentate; inner lip only slightly inflexed, and oblique, about half the length of the aperture; second varix on a line with the columella. Long 11, Lat. 5.

There is a small fossil of this genus in the Vienna Miocene, *T. parvulum*, Michl., but it is larger than the foregoing, and is distinctly ribbed throughout. Our existing *T. quoyi* is also small, but the size of the present fossil at once distinguishes it from all known species, fossil or recent.

Cominella cancellata. n.s. Shell solid, imperforate ovally pyramidal, costate and lirate: apex subacute, smooth;

whorls 7-8, convex, subangular and somewhat concave at the suture very distinctly and slenderly cancellate throughout (the spiral liræ being a little smaller than the longitudinal with a tendency especially at the base to become alternately large or small) at the angle coronate with rounded ribs which are obsolete below (about 14 on last whorl) aperture oval; outer lip acute, simple, columella excavated anteriorly and slightly twisted; canal short. Long. 24, lat. 13. Long apert. 13.

In form a good deal like one existing *C. costata*, Quoy, but the ribs are smaller and neater while the cancellation entirely removes it from any Australian species. In the European Miocene *Buccinum philippi*, Micht., appears the nearest form, but that is very different—more turriculate, not ribbed on the lower whorl, lip thickened, etc. Some of the Belgian Eocene forms come perhaps a little nearer.

Cominella lyræcostata. n.s. Shell rather small, fusiform turretted, lirate and costate; apex smooth white, turbinate of $2\frac{1}{2}$ whorls, whorls 8, rounded, closely, ribbed with round prominent ribs (16 on last whorl), and very conspicuously spirally lirate, with liræ which pass over the ribs; in addition to which the whole shell except the apex is finely cancellate, suture deep and margined; aperture oval, outer lip acute, finely crenulate, columella twisted, canal much recurved with a distinct enamelled plait passing from the centre of the notch to the back of the columella. Long. 19, lat. 7. Long. of apert. 7.

In older larger specimens the ribs become obsolete in the body whorl, but as the dimensions grow they are very conspicuous, and extend from suture to suture without alteration. Approaching in character the Miocene *Buccinum prismaticum*, Broc., of Vienna, but all the fossils of Europe differ much in the aperture, and have the inner lip reflected over the columella. This species differs from the last in the whorls not being angular nor coronate; in the larger liræ, the more prominent ribs, the contorted canal, and the general form.

Thala marginata. n.s. Shell small slenderly fusiform; apex obtuse smooth, shining, of three whorls; whorls 7, rounded oblique, plicate, sub-angular, coronate and conspicuously grooved above, finely spirally lirate, and undulately striate with lines of growth which show the semilunar sinus very plainly upon the groove; plaits anteriorly absolete on the body whorl; suture conspicuously marginate; canal straight, narrowly ovate, canal prolonged, equalling the aperture in height, outer lip thin, inner lip reflected on the columella, and with 3-4 very distinct plaits. Long. 8, Lat. $3\frac{1}{2}$, length of aperture to the end of canal 5.

The genus Thala was erected by Messrs. H. and A. Adams in 1853, for shells which combine the characters of Mitra, Pleurotoma, and Fasciolaria. The type specimen. *T. nucifera* was found in the Philippines, and perhaps this makes only the second or third specimen of a very rare genus.

Marginella octoplicata. n.s. Shell solid, smooth, shining, pyriform, spire scarcely visible, of three very small depressed whorls, body whorl distinctly striate with lines of growth, mouth narrow, sub-sigmoid, columella with *eight* plaits, the anterior valid, scarcely oblique, the posterior four faintly traceable, outer lip much thickened, and very regularly dentate with 12 raised linear teeth, at the base of the columella there is a distinct varix, which proceeding round the posterior end of the shell unites with reflected lip making that broadly marginal.

This shell has considerable resemblances to certain forms from the Indian Archipelago, but is unique in its multiplicate columella, and peculiarly dentate outer lip. In this respect it bridges over the gap between Marginella, and Erato, and Cyprea. *M. 5-plicata*, Lam., *M. elegans*, Gmel., and *M. turbinata*, Sow., show an approach to this form, but they are larger shells. If the lower part of the columella were not so distinctly plicate, and the upper teeth so rudimentary I should have no hesitation in placing this as a species of *Erato.*

Marginella strombiformis, n.s. Shell small, solid smooth shining, ovate, narrowed anteriorly, spire short obtuse, whorls four, rounded, body whorl obscurely longitudinally plicate below the suture, columella anteriorly obliquely somewhat coarsely quadri-plicate, aperture narrow, curved posteriorly emarginate, outer lip conspicuously thickened and produced posteriorly, finely, tuberculately dentate within. Long. 3, lat. 7.

Very different from Australian forms, all of which, as far as I know, have the lip smooth. It is nearest in form to the Indian *M. Marguerita*, Kiener, but that is a somewhat larger and more angular shell. Not unlike a minute strombus viewed from above owing to the produced lip. The genus is very poorly represented in European tertiaries, few being known and none living in the northern seas.

Marginella wentworthii. n.s. Shell small, ovately oblong, tumid, smooth, shining; spire exsert, obtuse, whorls five, roundly angulate, aperture narrow, oblong, outer lip much thickened, deeply channelled above, enamelled on the edge, with numerous small tubercular teeth within the margin; columella with four plaits; the three anterior oblique, fourth at right angles to the axis, anterior aperture widely channelled. Long. 6, lat. $3\frac{1}{5}$ mil.

Trivia europea. Montf. Testac. Brit. (as *Cyprea*) *C.*

coccinella. Lamarck (1810, *Ann. Mus., vol.* 16, *p.* 104. *T. coccinelloides, Sow. Min. Conch, vol.* 4, *p.* 107, *pl.* 378, *fig* 1. *Nyst. Coq. Foss. de Belg., p.* 609.) The shell which I thus identify I distinguish by its size, the absence of dorsal division between the striæ and the arcuate aperture. It is found throughout the Miocene of Italy, France, Austria, Sicily, and exists in the Mediterranean. I can find no ground whatever for separating our fossil from the one described as above. An unusual number of works (31) are cited by Hörnes and Partsch, whose Foss. Moll. and the above-named authors I have been able to consult, besides Wood on the Crag Mollusca, Deshayes, Lamarck, while specimens of the Italian fossil are in my possession, and except that they are a little longer I can see no difference. Long. 7, lat. 6. The knowledge obtained recently of this wide-spread diffusion of some species will prevent that difficulty hitherto experienced in the identification to European species, and will prevent their needless multiplication on geographical grounds alone. The shell is, however, very distinct from our *Trivia australis*, Lamk.

COLUMBELLA CAINOZOICA. Shell minute smooth, somewhat solid, narrowly pyramidal, spire longer than the aperture, apex elongately naticiform of two smooth shining whorls; whorls in all six, very slightly rounded, almost flat, smooth, but not shining with faint striæ of growth, suture distinct; aperture broadly sigmoid; outer lip thickened and finely dentate; columella smooth with five corrugated plaits behind, passing obliquely to round the notch which is broad and scarcely recurved. The outer lip is thickened into almost a varix, and the last whorl has the striæ of growth raised so as to become almost like costæ. Long. 4, Lat. scarcely 2.

In shells which differ so little in form as to cause the majority of specific distinctions in existing forms to depend upon colour alone, it is difficult to give such a description as will not apply to many other species. This species therefore must be distinguished first by its small size. 2. By its thickened almost varicose lip. 3. By its very prominent striæ of growth. 4. By its naticiform apex (which it shares with many living Australian species, especially *C. minuta*, mihi, which is much the same in size); and, lastly, the peculiar corrugations from the back of the columella and round the notch. No living or fossil form known to me unites all these details, though in general form our fossil is not unlike *C. scripta*, Bell., a much larger form of the Vienna Miocene. The genus is almost unknown as fossil, but very numerous as living species, probably over 200. All subtropical, two being in New Zealand, but none fossil, in any of the extensive tertiary deposits of those islands.

Columbella oxleyi. n.s. Shell small, fusiformly turretted, smooth, shining; whorls 8, somewhat rounded, overlapping slightly at the suture, apex with a distinct natica like pullus extending for $2\frac{1}{2}$ whorls, smooth, pyriform, much narrower posteriorly, and produced, with a narrow sloping channel anteriorly, outer lip thin; inner lip slightly inflected over the columella, behind which are numerous sloping fine regular liræ. Body whorl slightly angulated at the suture. Long. 9, Lat. 3 mil. Named after the early explorer of N. S. Wales.

This singular fossil varies from Columbella in particulars of almost generic importance, not only in the apex but in the turriculated habit. It has no known living form in Australia.

Natica vixumbilicata, n.s. Shell globose, smooth, shining, very finely cancellate, which is visible only with a lens; spire acute, slightly exsert as a more finely rounded coil; whorls 6. The apical 4, small, round, and distinct, only slightly increasing in size, the last two becoming suddenly globose, aperture semilunar; outer lip thin, inner lip everted anteriorily into an acute projecting angle, umbilicus small narrow, deep, slightly callous above, with a conspicuous groove leading to it from the anterior angle of the lip. Long. 20, lat. $13\frac{1}{2}$, long apert. 12, lat. 7, diam. of umbilicus $1\frac{1}{2}$.

Cucullæa cainoizoica. n.s. Shell roundly trigonal, oblique, globose, smooth, faintly and closely marked with radiating ribs and concentric striæ, the latter well defined and somewhat rugose at the margin and sides, umbones very acute and recurved; ligamental area, arched, broad, with six straight grooves on each, which are well defined and overlap each other alternately under the umbo, hinge teeth, 6-7, bent under the hinge and then bicuspidate, muscular impressions lanceolate, well defined, the anterior adductor with a slightly lamellar edge, margin finely pectinated with very distinct crenulations which continue in young shells all round as far as the hinge. Young shells are also more quadrate and have the angular ears slightly developed. Altogether the shell is intermediate between Cuculloea and Pectunculus and partakes somewhat of the character of both genera.

Nucula tumida. n.s. Shell small, solid, obliquely trigonal, tumid truncated anteriorly, slightly produced and rounded posteriorly, finely wrinkled with consecutive irregular rounded ribs, increasing in thickness from umbones to margin, and irregularly grooved with deep consecutive lines of growth, margin thickened and bilabiate, hinge teeth small diverging progressively in an increasing series, interrupted by a narrow deep ligamental pit, largest teeth slightly bent, anterior row short, eight in number, the distal ones smaller, but all high and lamellar, umbones fine and sharply incurved;

lunule shallow but well defined, wrinkled and broadly lanceolate. Transverse long. 13, lat. 11 ; thickness of both valves united, 8 mill. Not unlike the Tasmanian *N. grayi*, Sow., but more tumid and conspicuously sulcate.

Leda crebrecostata, n.s. Shell minute, depressed, transverse, trigonal narrowly oblong, roundly obtuse in front, much punctured, almost angular, and slightly gaping behind, sinus conspicuous—2—sub-depressed and conspicuously cut by an angle from which the shell slopes to the margin, whole surface of the valve regularly concentrically marked with equal rounded ribs ; hinge line inconspicuous, and short anterior sub-ligamental area distinct. Transverse long. 5, lat. 8, thickness of both valves joined 3.

The sinus and angle project from the margin of this fossil like a tubercle. Smaller and less rostrate than *L. caudata*, Don but like it, distinguished by the abrupt angulation of the sinus. There is no European fossil like it in this respect.

Cardita gracilicostata. n.s. Shell roundly oblong, transverse, inequilateral, oblique, globose, solid, furnished with 30 to 34 fine, curved, radiating, finely nodular ribs, which are narrower than the interstices, nodules obsolete to near the centre, whence they become less rounded and more lamellose to the margin, where they are almost spinous, and united to one another by transverse raised liræ, umbones, finely ribbed, acute, oblique, and much incurved, lunule, short cordate, well defined and deep, hinge area much overlapping the hollow of the umbones, hinge with one central tubercular, rounded tooth, round which the laterals make a complete arch, much thickened posteriorly. Margins coarsely crenulate. Long. from umbo 27. Transverse lat. 31. Alt. of both valves 14 mil.

Lima bassii. n.s. Shell oblong, subquadrate, rather solid, somewhat tumid, radiately and squamosely ribbed, margin full, and equally rounded with a prolonged curve ; anterior side short, and very slightly concave, almost margined through its whole extent by a small, narrow, obtusely angled auricle, which has three small rough ribs, and is deeply striate near the umbo, posterior side without auricle, truncated with a straight, sloping line deeply impressed with fossa towards the interior ; ribs 22 in number, radiating regularly, divided at equal intervals by long arched, raised squamæ, etc., umbo acute and only slightly curved. Length from umbo to margin 27. Lat. 22 mil.

Very distinct from any Australian congener by the absence of the auricle and the straight posterior side, though the form closely approximates to the sp. *L. squamsa,* now living in the Red Sea and Mediterranean.

Lima (Limatula) subauriculata. Montf. This shell which is also found in the British seas still existing, and has been collected by Cumming in the Philippines, is a common fossil at Table Cape, at least I can discover no difference in size, shape, makings, etc. We thus have a world-wide distribution as well as an extensive range in time.

Tellina cainozoica. n.s. I give this name to a shell which has characters slightly different from any existing Australian form, but the number of species is already so great and the differences so slight that I venture to add to them only with considerable reluctance. The form of this fossil approaches to our *T. albinella*, of which there is a white and pink variety. It is, however, smaller, smoother, and less arcuate with scarcely a perceptible sinus. The dimensions of this specimen is transversely 24. Long. 15. Thickness 5.

Chione propinqua. n.s. Shell small, oval, transverse, equivalve, sub-equilateral, posterior and slightly longer and sub-attenuate, anterior end broadly, rounded, transversely ribbed with many solid, raised, rounded ribs grooved behind and lamellar at each end, ribs striate transversely and between which the striæ become larger towards the umbones and finally indistinguishable from the ribs of which there are 18-20 in all; interior finely crenulate right round to the hinge posteriorly, to the umbone anteriorly; central tooth bifid, lateral,—anterior lamellar and moved outwards; posterior bifid, muscular impressions scarcely perceptible. Transverse length 26. Lat. 4.21. A shell certainly very nearly approaching our existing *Chione conularis*, but less oblique in its shape, size, and almost entirely crenulated margin.

Venus (chione) cainozoica, n.s. suborbicular, inequilateral, globosely convex, very finely and closely striate with concentric lines, which here and there become lamellose, lamellæ close and more numerous at the anterior and posterior margin, scarcely raised, extremely thin and nearly always broken and incomplete, where there are no lamellæ, striæ regular and equi-distant, marking lines of growth which seem to overlap each other in regular succession; anterior side rounded, contracted; posterior side broadly rounded and very slightly produced; umbones convex, much incurved and smooth, lunule clearly defined, but not deep, broadly cordate lamellosely striate and radiating from the umbones, and finely crenulated on the edge within; hinge teeth, right valve with one long lateral ridge extending to the ventral margin with a groove between it and the edge, three smaller teeth, the two posterior bifid, the anterior one small, lamellar and oblique; left valve with a lateral ridge, one thin short curved hinge below the corselet, one broad central tooth; and two anterior, one oblique and lamellar and one more tubercle, the whole anterior, ventral margin finely crenulated. Transverse. Long. 22, Lat. 18. Thickness of both valves 17.

This fossil is very completely removed from any known existing Australian form, being more globose, more finely striate; and the peculiar crenulation of the margin which extends under the lunule. I am not acquainted with any fossil form near it as far as my acquaintance with the European Miocene and Eocene extends. It must be admitted, however, that the points of distinction in shells where there is so much general resemblance, as in this genus,can scarcely be made out without the closest attention to details and comparison of specimens. The descriptions by most ordinary writers on palæontology are quite insufficient.

Chama lamellifera. n s. Shell somewhat small, thickish, globose, angularly orbicular, very inequivalve, and adherent. The whole surface of both valves covered with close thin irregular lamellæ, which, though sometimes projecting slightly, never become much produced or spiny, in the grooves between fine and smaller ridges can be seen; left valve very convex, attached anteriorally where it is sharply angled and flattened; umbones small and very much incurved, making almost a spiral whorl; hinge linear and curved with a broad flat concave linear fossette under the dorsal curve, right valve solid, very convex (but less so than the left valve) with an incurved sloping prominent umbo. Largest specimens about lat. 24 by 22 and 18 mill. thick.

In the absence of radiating striæ the non-spinous or produced lamellæ, and the size, all this species differs from the known fossil Chamæ. It is very abundant in the beds.

Besides the foregoing fossils I have provisionally named the following not being able to publish a more extended diagnosis because of the imperfect state of the specimens.

A small smooth Pyramidella, *Pyramidella roberti*, mihi, with perfectly flattened smooth whorls, 12 in number; the apex of 3 round smooth turns; the aperture subquadrate; base of columella everted. Long. $6\frac{1}{2}$, Lat. 2 mill.

Rissoina tateana. Almost turbinate, numerous oblique solid ribs on upper whorls; lower whorl almost smooth; outer lip varicose. 1 mil. Lat.; Long. (?), (decollated.)

Gibula clarkei. n.s. A turbinated multicarinate shell, obliquely, regularly, and finely lirate, where they cross the carinæ, making the latter almost granular; whorls 6; flattened and broadly canaliculate at the suture; base flat or convex, grooved, deeply umbilicate, obliquely striate within, shell a brilliant green nacre underneath the outer shelly coat. Diam. and Lat. about 3 mil., dedicated to the eminent geologist, the Rev. W. B. Clarke. A fossil which varied so much in the few specimens I examined that I hardly liked to include it in my list.

DENDROPHYLLIA DUNCANI. n.s. This is a compound corallite, with a very imperfect epitheca. It gives off four branches from a kind of internode, but in the specimens examined by me (among the corals collected by R. M. Johnston, Esq., Dr. Milligan, and Mr. Stephens), the branches and stem were broken off short. It differs from the hitherto only Australian tertiary species in the internodal character of the branches and the imperfect epitheca. A complete diagnosis will no doubt be published by Professor Duncan, to whom the specimens will be forwarded, but I have taken very gladly the opportunity of dedicating it to the learned Professor, to whom the science of geology owes so much.

FLABELLUM DUNCANI. n.s. The coral is cuneiform and very much compressed at the base, which is pedicillate. The calice is elliptical and shallow. The septa are in six systems of three cycles, delicate and well apart, the principal exsert and rounded, having few large rounded lateral granules. The fossa is deep and rather broad. There is no columella. There is a stout epithera, and the costæ are strongly marked, linear tapering with faint transverse curved folds, 22-24 in number. Height, 6, transverse diam. of calice, $4\frac{1}{2}$. Lat. 3, millim. This is the fifth flabellum described from the Australian tertiaries. It is smaller than any of them, and mainly distinguished by the distinct external costæ.

BUSKIA. nov. gen. This genus is proposed for Escharas, which are disposed on a cylindrical hollow axis, which is branched and irregular. It differs from Eschara in not having the cells back to back, but on one side only of the cylindrical branches, and from Hemeschara, in being erect and branched, and not encrusting.

BUSKIA TYPICA. n.s. Cells disposed sometimes quincuncially and sometimes irregular, surface of the branches crumpled aud flexuous, elliptical branches irregular and widely separated; if bifurcating a very wide cellular interval between the opposite divisions; cells convex and projecting from a very clearly defined margin, within which there is a row of pores continuing all round from 18-26 in number. From each pore there is a deep grove to the mesial line, which is also sometimes grooved, and then the surface has a rugose corrugated appearance; mouth orbicular, with a somewhat larger often pyriform pore on each side. Width of some of the branches, 10 diam. 7 mill.

ECHINODERMATA.

The following notes on the Echinodermata have been made by Mr. Johnston, some of which I have examined and compared the species, and added the specific names, with a few verbal alterations.

Micraster brevistella. *Laube.* Rather more rounded than Laube's figure. It is slightly compressed dorsally; central surface concave. The anal orifice is triangular in appearance, with the apex towards the "plastron," and is situated on the posterior of the ventral surface.

The plastron is round, and is situated near the middle of the concave ventral surface. The five ambulacra radiate from the apical disc in a graceful though slightly irregular manner. The pores 27 to 37 double pairs on each ambulacrum, extend about half way over the dorsal surface; and from the extremities of each double pair, the two grooves are continued round to the ventral surface, and thence to the plastron. The groves may be described as irregularly parallel to each other. The whole surface is densely covered with rather small tubercles, uniform in size, and surrounded by scrobicula.

Micraster etheridgei. n.s. Test small, oval, depressed, and surface very much flattened; ventral slightly concave; ambulacral groves 5, well marked and continued from apical disc on the dorsal surface to the plastron on the ventral surface; anal orifice, small, round, situated at the posterior ventral margin; plastron, central, round. The whole test covered densely with tubercles, small, but irregular in size and distribution. The dorsal surface is too imperfectly preserved to make out the apical disc or ambulacral pores clearly.

Hemipatagus woodsii (var. a) Cordiform. Differs from *H. woodsii* in the following particulars:—Apical disc contains 5 ocular plates, and is situated nearer to *anterior* end of test madreporiform body angular: odd ambulacral groove, much shallower than in *H. Woodsii.*

Primary tubercles greater in number; occasionly *one* primary tubercle is found situated on the posterior interambulacra. Great breadth nearer to anterior and than upon *H. woodsii.* Dorsal surface much more flattened and depressed.

Note.—Prof. Duncan has lately shown that *Hemipatagus* is a genus identical with the living *Lovenia,* Gray.

ON A NEW SPECIES OF AMPULLARIA.

By the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., Corr. Mem. Roy. Soc. Tas., Sydney, &c.

I beg to bring under the notice of the Society a new species of *Ampullaria,* a genus hitherto unknown in the Australias. Some time since I described all the known freshwater shells of the island which duly appeared in last year's transactions. Since then I have described a new *Valvata, V. tasmanica* which was discovered by that most industrious entomologist, Aug. Simson, who obtained it from a creek in Gould's Country. Since then in looking over some shells kindly placed at my disposal by Ronald Gunn, Esq., F.L.S., I have found the Ampullaria which I now describe. It is small in size, but very interesting from the fact that it is the only species of that very large genus which has yet been found in any part of Australia. Fortunately, though the collection of individuals was small, yet the most of them had the operculum *in situ,* which enabled me to pronounce that it is shelly. The genus has only been studied of late years, and is found best represented in South America, where it attains a large size, and presents beautiful varieties of colouring. I was unable to ascertain the precise habitat from Mr. Gunn, who was, however, certain that it was obtained from some of the rivers emptying themselves on the north coast.

Ampullaria tasmanica. *n.s. A.t. parva, subglobosa, cornea, spira brevi, obtusa, epidermide atro-olivacea, induta; anfractibus 4, subito decrescentibus; apertura lata, simplici, postice angulata; labio alba, conspicua, concava, reflexa, fauce ætate albicante. Operculum subconvexum, lævigatum epidermide (?) olivacea indutum.*

Shell small, subglobose, horny, with a short obtuse spire; epidermis blackish olive; whorls 4, rapidly decreasing, aperture wide, simple, angulate posteriorly, inner lip white conspicuous, reflexed, concave; throat becoming whitish with age. Operculum, sub convex, smooth, with an olive epidermis (?)

Diam. maj. 3½, min. 3 mil.

This little ampullaria has no determinate characters except its small size, dark color, and white concave inner lip. The penultimate whorl is rather gibbous.

REMINISCENCES OF A VISIT TO THE VOLCANOES OF HAWAII.

By His Excellency, F. A. Weld, Esq., C.M.G.,
President of the Society.

[*Read* 12*th September*, 1876.]

——"et incedis per ignes
Suppositos cineri doloso."
Hor., Carm. 1., lib. ii.

Some time ago your Honorary Secretary expressed a wish that I should read you a paper upon my visit to the volcanoes of the Sandwich Islands, and my ascent of Mauna Loa, "the great mountain," during the eruption of 1855; and, desirous of doing anything I can to meet the wishes of the Fellows of this Society, I promised to do so. It is now my object to fulfil that promise to the best of my ability, but you will forgive me if I present you with a simple personal descriptive narrative, instead of a scientific disquisition worthy of a place in the proceedings of this Society.

It is a matter of regret to me that my journal written at the time has been left in England, but I have used as a groundwork for the more important part of this paper a letter to Sir Charles Lyell, written by me at his request, and published in the proceedings of the Royal Geological Society; and though so many years have elapsed since 1855, a recollection yet remains to me of my journey up Mauna Loa, as vivid as if it were only yesterday that I toiled over its wastes of lava and gazed into its seething craters with eyes that could scarcely meet the glare.

The Sandwich Islands, as you know, are a group in the North Pacific Ocean, lying a little south of the tropic of Cancer, and between longitude 155° and 160° west, and that one of them, to which I am now about more particularly to direct your attention, is Hawaii, called by Cook Owyhee, and is the island where that great navigator and discoverer lost his life. It is stated that one of these islands was first seen in 1542, by a navigator named Gaetano, of whom I have been unable to learn any particulars, nor do I know upon what authority the statement rests; however that may be, Captain Cook may fairly be said to have been their first discoverer in 1778, in the sense of having first visited them. It is a curious circumstance that, as I was informed on the spot, at the time of his arrival a native tradition existed to the effect that "Lomo," the god of fire, white skinned, and fair haired, had been driven from their island, with his followers, on account of some escapade and indiscretion into which the natural fervour of his disposition had led him. The tradition went on to say that he would one day return across the sea to revisit his ancient abode. When the sails of Cook's ships were seen rising like clouds above the blue waters of the Pacific, and moving shorewards, a cry was raised that Lomo, the fire god, was returning. Priests and people flocked to the beach, and when they saw the strange appearance of the Englishmen, their white faces, smoke issuing from their mouths—owing, no doubt, to the use of that fragrant weed which is generally so dear to sailors—and still more when they saw and heard the fire of the guns; doubt was converted into certainty; victims were prepared, and the great navigator was led to the sacrificial temple, or enclosure of terraced stones; heathen rites were performed, and sacrifice was offered to him. Unfortunately, disputes which arose led the natives to believe that Lono or his followers had not forgotten their ancient propensities, and having failed, as they thought, to propitiate him with their sacrifices and offerings, it was resolved to inflict a fresh term of banishment upon him, and to drive him again across the seas. As Cook was retreating to his boat, under the pressure of the angry and menacing crowd, one native, more excited than the rest, pushed him violently, causing pain, which Cook showed by an exclamation, or gesture. They then saw that he was sensible to pain, and consequently but mortal, and a native at once dealt him a heavy blow with a weapon; he fell wounded, and was quickly killed, to their astonishment at first, and subsequent regret. You will, perhaps, pardon this digression, as I think these incidents throw light upon the circumstances of the death of this great sailor, when compared with the account given of it in the narrative of his voyages.

It was nearly at the end of October, 1855, when I landed on the Sandwich Islands. I was travelling with an old friend and fellow New Zealand colonist, the Hon. James Frederick Stuart-Wortley, and after visiting Tahiti, we took our passages in a schooner sailing thence for San Francisco, hoping to touch at the Sandwich Islands, which we were anxious to visit, as we had heard that the volcano in Hawaii was in full eruption. We were, after all, only enabled to accomplish our purpose by the kindness of the captain of an American whaler, who allowed us, when near the islands, to transfer ourselves to his ship, and who landed us at Lahaina, on the island of Mawé, in the central part of the group.

On Mawé is the immense extinct crater of Mauna Haleakala, or mountain of the House of the Sun. It is variously estimated at from 24 to 35 miles in circumference, and is not much less than 3000ft. deep. It stands about 10,000ft. above the sea level. Within this enormous basin, which would hold several of the largest cities in the world, rise numerous funnel-shaped cones, which formerly belched forth flame and molten lava, and still, though crumbling away, rise to the height of several hundred feet. The walls of this crater, which is, I believe, the largest known in the world, are burst through in two places, by the force of eruptions of lava. Our stay in Mawé was too short to enable us to visit it, an opportunity having offered itself which enabled us to proceed to Hawaii, the principal aim and object of our journey; where we visited, as I am about to describe, the similar though smaller crater of Kilauea, in full activity. The opportunity of reaching Hawaii was afforded us by the departure thither of a small schooner of about 35 tons, called the Manu o ka wai, ("Bird of the Water"), and here let me remark, as an instance of the great similarity of the Maori or New Zealand language to the Kanaka, or Sandwich Island dialect, that in Maori the name would have been Manu no te (or ke) wai; in fact, the language of these two groups, the one in the same latitude as Tasmania, and the other at the northern tropic, is so nearly identical, that I soon found that what I knew of Maori was readily adapted to intercourse with the Sandwich Islanders.

It was on the evening of November 3rd that our little schooner got under weigh, and glided out from among the fleet of whalers in the roadstead, and away from the scattered cottages and houses, and cocoanut trees of Laihaina. It was a glorious evening, and the great volcanic mountains of Mawé, and the neighbouring islands, loomed grandly in a golden haze, as the sun got low, and we stood out into the open sea. Our tiny craft presented a singularly curious and picturesque appearance ; her cargo, most closely packed, was human ; a very fat chieftainess, with about a dozen of her ladies in waiting, filled the little cabin, and on deck we counted between eighty and ninety persons, almost all women and girls, going on a visit, they told us, to their friends in Hawaii, all dressed in light calico " roundabouts " of bright colours, and all wearing wreaths and flowers in their hair. This looked well enough in the sunlight ; but I well remember in what a dark blue-black the last island to the westward stood out against the fading streaks of red on the sky, when the sun went down. The wind began to whistle shrilly ; we took in sail ; our poor lightly clad fellow-passengers huddled together, and a shiver ran fore-and-aft as the first cold spray swished over them. They laughed at first, and throughout bore up bravely ; but it grew worse and worse, and nearly all night long heavy seas broke over us ; but, even had not the deck been flooded, there was not room on it to lie down ; Wortley and I spent the night sitting against the bulwarks, now and again helping to work the vessel, or taking a turn at the tiller, when the native skipper—who behaved admirably—had to go forward to see to the head sails, or to keep his crew up to the mark. When at length a dull leaden morning dawned, we were hove to in a tremendous sea, our binnacle and compass smashed, and no land anywhere in sight, though the clouds were beginning to break. Our deck presented a marked contrast from yesterday evening. It was hidden by superincumbent strata of drenched and shivering feminine humanity, blended in one chaos of sodden calico, wet dishevelled tresses, draggled wreaths, and general misery, on which the native sailors trod without the slightest compunction, for there was no stepping room between. At noon it began to clear up, and the sea moderated ; still we in vain looked out for the mountain tops. The captain had run before the wind out to sea all the first part of the night, and calculated that we were about 80 miles from land. We steered in search of it by my pocket compass, and when night again came the stars shone out, to thecaptain's great delight ; he, however, was utterly exhausted, and turned in. The native left at the helm had also a theory of the stars and navigation, and was bent on steering in the wrong direction, besides performing most surprising nautical aberrations ; remonstrance being unavailing, Stuart-Wortley and I were obliged forcibly to depose him, and take command. Under these circumstances of some responsibility, and perhaps with the slightest possible shade of doubt as to our own perfect capability as navigators, and the exact correctness of our course ; for we did not know exactly where we were, and had neither charts nor ship's compass—under these circumstances, we were not sorry when we saw high above the morning mist the great smooth gently rounded dome of Mauna Loa, with smoke rising from two craters, the somewhat more rugged crest of Mauna Kea, and the dark mass of Mauna Hualalei. The scene was imposing, calm, and grand, rather from vastness than from any beauty of outline. These three mountains of Hawaii are respectively 13,700, 13,800, and 10,000ft. in height. They have not the sharply defined peaks and crags common to most volcanic mountains.

About mid-day on the 5th we made the shore, and landed at the village of Kawaihae, on the north-eastern coast of Hawaii, situated some 30 miles north of the Bay where Captain Cook was killed. At Kawaihae we visited the remains of a Heiau, or heathen temple, an enclosure surrounded and paved with stones, and with stone terraces in front, on a slope descending towards the sea. Leaving Kawaihae and its few clumps of cocoa nut palms, my friend and I, with a native guide, turned our backs on the sea, and walking westward ascended a long rise, where the wild indigo plant, the prickly pear cactus, some grass and other vegetation, grew in thin red volcanic soil amongst stones and scoriae. A few miles brought us to an elevated tract of table land of better soil, and to a settler's homestead, where we obtained a horse and a little pack bull, and secured the services of one or two more natives, a pleasant relief from carrying our own food and baggage. Our journey then lay along an upland valley, the Waimea, tolerably well grassed, with here and there a grove of trees or bushes, and next entering forests chiefly composed of Koa *(Acacia falcata)* which bears a remarkable resemblance to the Eucalypti in leaf and seed vessel, we rounded the northern shoulder of Mauna Kea, the most northerly of the three great mountains, sometimes catching glimpses of the snow on its summit range through the trees. It was near here that the botanist Douglas met his death by tumbling into a pitfall, into which a wild ox had already fallen, which gored and trampled him to death. We met a few of these animals, with long horns like a buffalo. We had only a shot gun and revolvers. They gazed at us and retired ; had they charged, our little pack bull might have fared badly. Passing through these forests, where the wild strawberry and raspberry abound, as does the "Cape Gooseberry" at a slightly lower elevation, and having attained a height as nearly as I recollect of about 3,000 or 4,000 feet, we commenced to descend on the north eastern side of the island, in a beautiful and very well grassed country which, deeply cut through by ravines filled with the candle nut tree *("Aleurites triloba")*, bread fruit, banana, and other vegetation, and dotted with clumps of Pandanus *(Pandanus odoratissima)* and bamboo, slopes down from the upland forests to the cliffs, which rise abruptly from the sea. Nothing can be more beautiful than this Hamakua district, or perfect than its climate. Turning now to the southward, and crossing a seemingly interminable succession of very deep ravines, and wading through clear fresh streams and rivers, that dash down their rocky beds, and often fall in cascades over the cliffs into the sea, we reached the town of Hilo, on Byron's Bay, on the 9th of November. As we approached it, we passed a few small coffee and sugar plantations ; and just before we reached it, we were amused by seeing a great part of its native population disporting themselves by jumping from a rock into the Wailuku River, floating on their back down to its waterfall, going over a perpendicular fall of 30 or 40 feet, feet foremost—plump into a deep still pool below. The Sandwich Islanders are probably the best swimmers in the world, and their feats in the surf are far more wonderful than this.

Hilo is a pretty village or small town embowered in cocoanut, breadfruit, and banana trees, and straggling along the shore of Byron Bay. It is, or then was, a great resort of whalers, and is the principal town of Hawaii. The ground rises gradually from it to Mauna Loa, the summit of which is about 40 miles distant in a straight line ; and when I arrived at Hilo the lava of the great eruption was steadily flowing down towards it and threatening it with speedy destruction. On our arrival we hired a vacant hut embowered in a grove of bananas from a native, and at once sat down to debate "ways and means," for we had wrongly calculated on being able to get money from Honolulu before this, and we found ourselves with a most dilapidated wardrobe and literally penniless, without introductions, and unknown to any one. I only wish that I could ever hope to be able to make some return for the generous confidence with which Mr. Pittman, the principal merchant of the place trusted us, advanced us everything we wanted, and not only extended to us assistance, but the most cordial hospitality.

We now began to prepare for our journey to the volcanoes. The three great mountains of Hawaii are all recent volcanoes ; Mauna Kea the most northerly of the three is somewhat the highest. Its summit bears evident traces of activity at no distant period ; but for many years it has not been in eruption. Mauna Hualalei, more to the southward and on the western coast, was in eruption a few years before my visit. By far the most active is Mauna, Loa, Kilauea, on its south eastern acclivity, and is the largest active crater in the world. It has been frequently visited by travellers. Above it Mauna Loa proper, presents an immense bare area, I should say 40 miles in diameter, smooth and gently rounded at its distant aspect ; but one mass of rough volcanic debris, scoriæ, and lavas of different ages, cut by deep lava ducts, and heaped with scoriæ and ashes ; and few years pass by without its bursting forth in one direction or another. Often it is, as it were tapped, by an eruption of Kilauea, which as I have said stands, like a great abscess in its side, some 8000 feet below its summit. In 1840 a flood of molten matter burst through underneath the rocky walls that form the basin of Kilauea, lowering the level of its floor by 60 feet.

For ten miles it flowed underground, occasionally lifting the earth and rock above, and sending forth smoke, inflamed gases, and burning lava ; then tearing its way out of the hill side, it rolled a flood of liquid fire through forest and jungle, which spread sometimes to a width, as Mr. Coan a resident missionary says, of four miles. In three days it had traversed 30 miles, and rolled itself in a cataract of fire a mile wide, over a cliff 50ft. high into the sea. For 20 miles around the sea was heated, and innumerable quantity of fish were thrown upon the coast killed by the heated water, and two islands were formed as the lava cooled after flowing into the sea, for two weeks. In 1843 a great eruption took place from the top of Mauna Loa itself. The melted lava ran down the northern side of the mountain for 30 miles, dividing itself into two streams from one to three miles broad. I owe these details to the Rev. Mr. Coan of Hilo, who, with much danger to himself, ascended the mountain and traced the stream.

In 1832 an erruption again took place at the summit of Mauna Loa, which threw up an immense fiery column of incandescent scoriæ, and inflamed gases to the height of about 500 feet, some say 1000 feet, and again poured forth a flood of lava. Mr. Coan this time also visited the mountain.

Many former eruptions have been recorded, and an account of them may be found in the journals of the Geological Society, Vol. 12.

I am not aware if besides Mr. Coan and myself, many, or indeed any, other persons have ascended Mauna Loa proper excepting Commodore Wilkes, of the American Expedition, who went up with a large body of natives and sailors, established a hospital on the side for those who suffered in the attempt, made some interesting observations, and returned after an absence of some duration to Hilo. A detailed account of his expedition may be found in the narrative of his voyage ; he seems to have considered the difficulties of the undertaking much greater than a person more accustomed to bush work and mountain travelling would have found them. The mountain was not in eruption when he ascended.

Kilauea, 4104 feet above the sea, is easily reached ; it has been several times described, I think first by Commodore Byron, after whom Byron's Bay is named.

I now come to the great eruption of 1855, which I was so fortunate as to witness. On the 11th of August 1855, the lava burst forth at about 12,000 feet above the sea level on the very crest of the range, but about 1000 feet below its highest part, and on the northern side ; it was rather remarkable for the enormous and unprecedented flow of lava than for any projection of inflamed substances into the air, though its light illumined the horizon for many miles, and the column of fire or its reflection was said by some to have been at first apparently 500 feet high. The Rev. Mr. Coan again made the ascent and visited it. At the commencement the lava ran northwards with great rapidity into the upland valley that divides the summit of Mauna Loa from that of Mauna Kea ; then taking an easterly direction, it poured down towards Hilo. The main stream was in many places about three miles wide, but as it reached comparatively level country, with forests, jungles, swamps, and streams, it spread to a width of five or six miles and flowed more slowly. At the time we left Hawaii (November 23rd, 1855), it had been gaining about a mile a week, but during the last week it had been making a somewhat greater progress. The whole length of the flow of the lava, including bends in its course, was then computed by residents at considerably more than 50 miles from the craters ; I should myself put it at about 35 miles as the crow flies, not allowing for sinuosities. It was then only about 8 miles from Hilo, which it threatened, but it did not advance much further, and ceased to flow not long after I left.

Our first good view of the eruption from Hilo was at night, from the deck of a ship in the bay, as the trees obstructed the view from the shore. The distant craters were scarcely visible, but the burning forests above and behind the town showed the front of the advancing lava torrent lightening up the night with a mighty glare, with sometimes a column of red light shooting up, occasioned probably either by an explosion of the half-cooled upper crust (from under which little streamlets of red hot lava keep running out and covering fresh ground like fiery serpents in the underwood) or by dried trees falling into the fire. The inhabitants of Hilo were justly alarmed, and many were preparing to put their effects on board ship. I was particularly requested when it became known that I was about to attempt the ascent, to endeavour to ascertain as nearly as possible the rate at which the lava was flowing, that it might be known whether the flow was moderating since Mr. Coan's expedition. Most people, however, said that I should never get to the craters ; Mr. Coan said it would take me a week or more. He kindly pursuaded a native who had been with him to accompany me, and with much difficulty I engaged two more, all strong and active men. We got horses to take us as far as Kilauea, and after completing our arrangements and spending a few pleasant days at Hilo we started.

The ascent, though very gradual, may be said to commence at Hilo itself. The weather was unpropitious, and where the path was not old lava it was deep mud ; indeed these two component parts of our track were so mixed up together that our horses were soon tired out by plunging along from hard to soft, and it was not till the second afternoon that we reached Kilauea, a distance not very much over 30 miles. The country varied between woods and jungles, chiefly of a tree of the myrtle family, bearing red and sometimes yellow flowers, not unlike the New Zealand Rata *(Metrosideros ?)* and open tracts of fern "Ti" *(Dracæna terminalis)*, which is also the Maori name for similar species, and grass. A little before reaching Kilauea we entered the region of the Koa tree, already mentioned, which is a useful timber tree, and also remarked a handsome yellow acacia, the raspberry, strawberry, and some tree ferns ; the soil, of a red colour, was covered with masses of scoriæ, and in many places we crossed hardened streams of old lava.

Our journey had been about 30 or 35 miles, at first about south by west, and latterly more westerly, when, on the afternoon of November 14th, we stood on the brink of the great crater of Kilauea, 4104 feet above the sea. We found a grass-built hut on the upper rim of the crater, and here we took up our quarters. The mountain of Kilauea may best be described as the base of a broad low truncated cone, standing on a high level plateau ; an excrescence, as it were, growing out of the side of the huge Mauna Loa. It looks as if the apex had subsided, leaving in the centre of the mountain a flat-floored sunken crater the upper rim of which is about seven miles in circumference ; sometimes the level of the bottom of the crater is tapped and lowered by underground eruptions that burn out at a lower level on the side of the mountain.

From our hut we looked down on two partially sunken ledges covered with grass, fern, and bushes, which, as well as the place where our hut stood, were in many spots steaming. In one place especially we noticed a large bank or mound composed apparently of a chalky substance, probably a deposit of some chemical salts with a great deal of sulphur, from which issued a considerable body of steam. Below these ledges lay the great crater like a flat-bottomed round basin. The depth from the top of the highest of the containing walls or cliffs to the bottom of the crater, has been calculated at 1,500 feet, though in many places it is considerably less. These cliffs or walls are in most places perpendicular, and appear to be composed partly of gravelly clay of a yellowish colour, and partly of dark basaltic or trap rock. The bottom or floor of the crater is constantly changing, quickly melting or hardening. Sometimes part of it is a lake of molten lava, red hot. Some Americans, that we met returning from it as we ascended, assured us that such was the case the day before we arrived. Such a lake is often a mile in length, by half-a-mile wide. When we saw it, however, nothing of the sort was visible. Looking down into the crater it had the appearance of a flat plain of dull lead-coloured lava, more or less broken and rugged in places, and containing an infinity of small mounds or cones, whence issued clouds of smoke, especially towards evening. As night came on, the action of the volcano seemed to increase, and the light of the subterraneous fires was seen in many places. Mr. Stuart-Wortley, who was prevented by indisposition from proceeding with me up Mauna Loa and remained at Kilauea till my return, observed some of the small cones or craters within the great crater occasionally ejecting hot stones and liquid lava, and on the night of my return from Mauna Loa, I observed the sam thing on a small scale. I may here mention that after my return from Mauna Loa, we climbed down a part of the wall where it is not very precipitous or difficult, and descended into the crater. This can easily be done, and some years ago a native chieftainess, named "Kapiolaní," having become a Christian, performed a gallant act, which should ever be remembered to her honour. She descended into the crater, and advancing to a pit of fire defied the Heathen divinity to whom the place was sacred, broke the "Tapu," that is its inviolate sanctity, and safely returned to her trembling and awe-struck attendants, who had expected her instant death. Pelé is the name of the goddess who, until that day, was supposed jealously to guard her fiery dominion, and to luxuriate in her bath of flames, as her votaries did in the cool waves that dash over their coral reefs. The capillary lava, which is supposed to be formed by the action of wind on liquid lava, strongly resembles hair of reddish, brownish, or golden hue, and is called by the natives Pelé's hair; I brought away several specimens, but regret that I have none by me. The floor of the crater of Kilauea, on which we spent an hour or two, is simply the cooled upper crust of fused lava; the numerous small mounds or miniature craters scattered over it, have orifices at their tops or in their sides like the mouths of limekiln, often double, through which you may look into the red hot depths below, and into caverns of subterraneous fire. We also remarked in places, long ridges of smoking masses and fragments of rock that had evidently been upheaved through the lava pavement, and piled confusedly upon one another. The lava itself upon which we walked was sometimes very hot, especially near steam vents and open abysses. The exhalations of sulphurous acid and other noxious gases were also in places an impediment to our explorations. The lava is generally of a dull glossy lead-colour when quite cool ; but of a brighter green or blue when more recent. Symptoms of melting of the crust upon which we walked, and increasing heat and vapour, came on as we left the crater and regained the fresher atmosphere of the upper world.

After a night's rest in the grass-built hut on the verge of the rim of the Kilauea crater—leaving my friend, whose strength was hardly equal to the enterprise, to keep house at Kilauea—I started on foot with three natives at early dawn on the morning of the 15th November to ascend the "great mountain." After walking a couple of miles we entered a wood, and commenced the actual ascent ; in about two hours we began to emerge from the wood, and by 9 p.m. we were fairly upon the bare lava. It was an old lava stream with various species of Epacris, a red whortle-berry, and similar plants growing in its crevices. Before us lay for miles and miles a wilderness of stones and scoriæ ; high up, far in the distance, rose the wreaths of smoke that marked the site of the new craters, the goal of my ambition. Our course this morning had diverged a little to the north, and then again to the south of west ; but now we made right for the upper crater on the rounded back of Mauna Loa bearing about west. Before us lay a waste of desolation ; on either hand belts of wood, that had escaped comparatively recent eruptions, struggled yet a little higher up the mountain side. We passed several large caverns ; lava-formed themselves, they had been once the ducts of streams of liquid lava. Some heaps of stones marked a place where a horse, and if I understood my natives rightly, some people had perished ; how they got the horse so far ; how they could have hoped to get him yet further, and for what possible purpose they brought him there at all, is a mystery to me, which my imperfect power of conversation did not enable me to solve. About 50 years before, and, so far as I could ascertain, not far from that spot, a native army, attempting to move from the eastern to the western side of the island, with the design of issuing forth upon their enemies from the gap between Mauna Loa and Mauna Kea, were smothered by a shower of ashes, similar to that so graphically described by Pliny, the younger, when Pompeii and Herculaneum were destroyed, and in which the elder Pliny lost his life. Proceeding onwards over lava and loose porous stones like pumice, only harder and somewhat heavier, we arrived, at about 11 a.m., at a few bushes and koa-trees, a little oasis of coarse grass, an old hut, and a deep rock-pool of delicious water in a cave. Here we halted to refresh ourselves, and then, leaving the old track which turns northward leading to the north-west side of the island, and which was, doubtless, that which the ill-fated army intended to pursue, we kept on our toilsome ascent over bare lava, now absolutely destitute of any vestige of vegetation. So rough and loose were the scoriæ boulders, and so sharp the vitrified lava like slag and clinkers from a factory, that I found my strong English shooting-boots cut through in many places, and blood was flowing from my feet, knees, and even hands; my natives were also in evil plight. I therefore tore strips off my shirt and bound them round my boots, and continued this operation as long as my shirt lasted. When I left the mountain two days after I was shirtless, and had utterly destroyed two pairs of boots. At about 3 p.m. the guide, disappointed in his expectation of finding another cavern containing water, after consultation with me, altered his plan, and instead of keeping his westerly course for the upper crater, turned to the right, north-west, hoping to find water at a spot some miles below the lower one. The consequence was, that bad as the walking had been before, it became, if possible, worse as we left an old lava bed and toiled mile after mile over nothing but loose sharp rocks and scoriæ of every possible size and shape, and piled in the wildest confusion. We succeeded, however, in finding a little water amid a few solitary stunted bushes, the sole residue of a burnt-out forest, and then again tending upwards and to the west, shaped our course directly for the lower crater of the two that were sending out dense volumes of smoke above us. We lay down for the night on a little patch of half-vitrified ashes. I suppose that we were then about 9000 feet above the sea, but we might have been considerably more. The next morning we started before sunrise. Having found to my surprise a few dry sticks, I thought so good an opportunity was not to be lost, and endeavoured to make some tea, but owing to the height the water boiled without attaining sufficient heat, and as water was very precious, I did not long continue the experiment, but returned what remained in the pannikin to our calabash. Our way now lay, mile after mile, over scoriæ boulders, yeasty-looking basins, and tortuous folds and waves of solidified lava, caverns and small chasms whence the hot lava had flowed away, hillocks generally of small stones burnt to a deep orange red, and here and there little smooth places covered with ashes,—altogether dark and dreary in colour, without a living thing or a green blade. That morning we passed the site of the eruption of 1852. The view thence of the opposite mountain of Mauna Kea was glorious. The old conical craters on its summit covered with newly fallen snow, its huge outline, shadowy and dim; the clouds of smoke that rose round its base from the intervening valley down which the present eruption was flowing; the wild dreariness of the foreground and the tropical sky above. Who could fitly describe or paint it!

And now a disaster occurred. A native fell and broke one of our two calabashes or gourds of water. One only remained, and it was not full. Our supply was reduced to a pint bottle of beer and less than two pints of water. We descended into a cave, and scraped off some damp moss and squeezed it into the pannikin, obtaining, after half-an-hour's labour, little more than half-a-pint of dark yellow liquid, tasting strongly of sulphur and dirt, so undrinkable that we decided on mixing it with the rest, a proceeding that had this advantage, that no one was afterwards inclined to drink more than nature absolutely demanded. The natives, now tired and worn out, lagged behind, and at noon I found myself alone at the lava of the present eruption, at a spot about a mile and a half below the lower crater, and about three miles below the upper one.

As far as the eye could reach, down the valley between Mauna Loa and Mauna Kea, I could trace the devouring flood in the valley and forests below; the stream of fresh lava at this point was about two miles in breadth, of a dark greenish colour, and dull metallic lustre where it had cooled or partially cooled on the surface; below it was liquid, and moving on under the upper crust. The surface, as cooled by the air, had congealed into every possible form and distortion—here wreathed about like rolls of shrivelled parchment—there split into slabs and fragments, sometimes with a smooth surface only broken by cracks and fissures—in other places twisted like strands of coiled rope, or rolled out into huge waves and serpentine convolutions. Through large cracks and openings one looked down into the fire below; and many of these fissures had to be jumped across. Smoke, steam, and gases, rose from many of these places, and often, when walking on apparently hard surface, an upper blister broke beneath the tread, causing a fall amidst steam and hot lava. I was fortunate in receiving no injury worse than a burn or two and the loss of a finger nail. As the day advanced I was somewhat uneasy at the non-appearance of my natives, for though I had no doubt of being able to find my way back, it would be difficult to find them amidst such a chaos of rocky ground; and I had neither food nor water, and time under those circumstances would have been a question of life or death. Mr. Coan, too, had said that it would at the least take two, if not three days, to get back to Kilauea; however, I felt sure that I could see both craters that day, and I had left Kilauea only the preceding morning, and I felt that it was possible by aiming straight for it, to reach it even without food or water by next night. Moreover, I had said at Hilo that I would bring back word as to the speed with which the lava was flowing, and it was of consequence that I should do so, for from its rate of flow might be calculated the probability of the continuation of the eruption, and the likelihood of its reaching the town. Now, to do that, I saw that I must walk on the surface of the cooled or partially cooled lavas till I reached its centre, where large open gaps in the crust showed the fiery flood beneath. They were a long way off, but I could know them by the glare that tinged the dull mantle of smoke and steam that rested on the lava. Besides my nerves were strung up, and, Englishman-like, I did not wish to be beaten. I resolved to go on, and, after I had done what I intended to do, then to go back as nearly as I could to the place where I last saw my natives, and I did not find them at once, not to delay, but to strike straight back to Kilauea at daybreak. I followed up the course of the eruption, keeping along its side. When I was within a mile or two of the lower crater I saw by the glow a very large lake of fire in the centre of the eruption, and determined there to make the attempt to reach it. At that moment, the native who had been on the mountain before, and whom I have called the guide, appeared, to my great delight. I hailed him, and he rejoined me ; I pointed out to him where I wented to go "to see the fire." He laconically observed, "You go there, you see plenty 'fire,'" and sat down. I went on. The eruption was here about three miles broad. Scrambling with great difficulty, sometimes through hot hollows, where I could hardly breathe, and sometimes jumping or stepping over fissures through which the fire was visible, I reached the object of my aim, the central crag of a huge arch, overhanging a lake of fire ; a place, in fact, where the surface crust had blown up or fallen in, exposing the flood to view for some acres. The crag seemed solid, and I reached it ; I was scorched and almost blinded by the glare ; I was as it were standing on a bridge, under which a river of fire as large as the Thames was slowly and smoothly rolling, that is, visibly as large, for, in reality, it was fully three miles wide in its underground flow as shown by the cooled surface, and I had reached about the middle. I stood so perpendicularly above the stream as to be able to drop a large mass of lava into the fire, and though the glare was too great to enable me to see distinctly, I thus satisfied myself that the flow was moving at the rate of about three knots an hour; in fact, that its rate of speed had sensibly diminished from the time Mr. Coan had estimated it. I was well satisfied when I rejoined my native, and we proceeded upwards to the lower crater together. Leaving on our right several large abysses and pits, we arrived there. The upper crust of the lava having cooled, the discharge from the crater was not visible. Some dark fantastically shaped rocks, some heaps of small stones, one of which, containing a large proportion of sulphur, was burning most furiously with red and blue flames, the whole surrounded by an ocean of partially cooled lava ; such was the lower crater. My native again very sensibly sat down at a little distance ; I scrambled on as best I could, till I reached one of the rocks forming the side of the crater, keeping well to windward on account of the dense smoke. Lying down on the warm stones, I attempted to look over, as it were, down a gigantic chimney, to see into the boiling cauldron, which I heard bubbling and seething. I got my head over the edge, and had just time to see a long, broad, fissure, full of smoke, when I was almost suffocated with smoke and sulphurous acid gas, the effects of which I felt for some time afterwards, and thought myself fortunate to escape in safety.

Still ascending for about a mile or a mile-and-a-half over the same chaotic confusion of loose scoriaceous rocks, torn and burst asunder, and lava warm and steaming, some of it lying in loose, flat dabs or flakes, as if it had been thrown hot into the air and fallen with a splash, we reached the upper crater at a height of about 12,000 ft. from the sea, or somewhat more.

The upper crater was simply an irregular and imperfect basin, of no great size, a hollow between two large mounds or hillocks of small, loose stones, with an infinity of small steam and smoke rents. Thence within it, and on the sides of the mounds, it sent up volumes of red smoke, and partially ignited gases ; in one place, from a small truncated cone, this was most apparent, the exhalation rising like the panting puffs of a steam engine. No doubt at night the inflamed gases would present the appearance of a column of fire, but in the day-time, to one who had seen what I had that day seen, the upper crater looked rather curious than imposing. The great heat did not allow a nearer approach than about forty yards' distance.

Nothing now remained but to return to the two natives, who, worn out and dispirited, had laid down about a mile and a half away some 500ft. below the level of the craters, and there we slept.

Few living men, perhaps, have looked on such a scene with such surroundings as I did that night. The night was clear with us. Over our heads spread the vault of heaven, starlit and moonlit; and all around, scarred and furrowed like an ancient world destroyed by fire, lay the great grey round face of Mauna Loa; above us its two craters sent up rolling volumes of lurid smoke. To the northward Mauna Kea reared its crest of snow into the moonbeams, looking down nearly 14,000ft. upon the mingled gloom and glare of the intervening valley, along which flowed the eruption, running downwards to the forests, and burning its way through them for miles and miles into the far distance by Hilo. To the east and south, before us, the low dark woodlands fringing the coast, slept in shadow with the sea beyond.

Solemnly grand and impressive it was, but it became sublime when clouds gathered some thousand feet below us; their upper surface as we looked down on them, shining white in moonlight, yet through which the lightning flashes played, and deepest thunders reverberated—still we were in perfect calm—and over and beyond the thunder storm I could look upon the glitter of the moon's rays on the placid sea—like Dante, with whose genius the scene so well accorded—

——— "Di lontano
"Conobbi il tremolar della marina."

Such was my last night on Mauna Loa.

In the morning, rising at the first sign of dawn, very great and sustained exertion, not without much suffering from thirst, and with bleeding feet, brought us back long after nightfall to my friend Stuart-Wortley, and to what seemed to us the comforts and luxuries of the old grass hut above Kilauea.

ON SOME NEW TASMANIAN MARINE SHELLS.

[Second Series.]

By the Rev. J. E. Tenison-Woods, F.G.S., &c., Cor. Mem. Roy. Soc. Tas., N. S. Wales, &c.

In the Proceedings of the Royal Society for last year (1875), I published descriptions of 82 new marine shells occurring in the Tasmanian seas. I have now to bring under the notice of the Society an equal number which have been derived from the following sources:—1st. From Mr. Ronald Gunn, F.L.S., the eminent botanist, so long connected with your Society, whose extensive collections, extending over many years, were placed at my disposal for description and type specimens of all presented to the Museum. 2nd. From the collections made by Mr. W. F. Petterd, during some years past, which were purchased by a few gentlemen and presented to the Society, to which also several new and rare species were added by the collector. Mr. Petterd has proved himself to be an industrious and most painstaking collector, who has not only had singular advantages for observation in his extensive travels, but has also been able to visit nearly all the Australian museums in the course of his wanderings, and very much enhance the value of his collections by comparison with the types therein preserved. 3rd. From the Rev. H. D. Atkinson, who has continued most successfully his dredging operations and thus largely increased the knowledge of our fauna, as the following pages will show, amongst which are several genera new to the Southern hemisphere, including the important discovery of a *Scissurella*, differing but little from the European *S. crispata*. 4. From Mr. W. Legrand, who continues his zeal and industry on behalf of conchological science, which already owes much to him 5. From Mr. Augustus Simson, the entomologist, whose duties unfortunately take him so far from the coast that he cannot always render that valuable assistance which his great industry and powers of observation would enable him to do. 6. From Mr. R. M. Johnston, the geologist, of Launceston, who has presented two or three interesting conchological novelties to the Museum, in addition to his very large collection of fossils.

The shells hereafter described comprise rare and peculiar forms, but not departing in any remarkable degree from the molluscan character of the Australian seas as far as at present known. Some of the smaller shells are not easily distinguished from species occurring in the Eastern Archipelago, Japanese, and E. Australian seas, and no doubt as dredging operations are pursued, these resemblances will be found still stronger. The number of species especially of the smaller forms in Tasmania would be surprising were it not remembered that it is almost a warm sea, with many islands, an extensive coast line, and an almost uninterrupted littoral connection with coral seas within the tropics, and, we may add, almost with the Indian Archipelago.

No. 1. MUREX (PTERONOTUS) ZONATUS. *M.t. subfusiformi tricalata, spira brevi, acuta, solidiuscula, alba, una fascia badia zonata; anfr. 6, convexis (ult. spira valde superanti) costulis transversis rugosis crebre cinctis; nodo uno strenuo varicibus interposito; varicibus haud latis, in 3 series contortas dispositis, continuis, compressis, infra suturas valde emarginatis et in spinam porrectis; in superficie anteriore crenato lamellosis, in cauda attenuatis; ore late ovato; canali postice emarginato et antice canali longo aperto curvato instructo; cauda lata, apice laevi, fauce edentata.* Long. 13½. Lat. 9. Long. apert canali incluso 8. Lat. 3.

It is sufficient to say of this shell that it is a small white species of the peculiar form of Murex common in South Australia and formerly common in Europe, during the earlier tertiary periods. It is distinguished by a conspicuous broad brown zone on a white ground. The three wing like varices are not very much expanded. Flinders Island. R. M. Johnston.

No. 2. TYPHIS ARCUATUS. Hinds. Voy. Sulphur. A small specimen of this shell has been dredged from 10 fathoms sand by Rev. H. D. Atkinson at Long Bay. It is paler than the described species, smooth with rounded broad varices which are bent back so as to become confluent with the tubes which crown the whorls.

TRÓPHON ASSISI. *n.s. T.t. ovato-fusiforme, griseo-olivacea; anfr. 6, convexis, superne angulatis, eleganter costatis, et peculiariter longit. crebre, tenuissime, lamelloso-striatis; transversim spiraliter conspicue liratis, liris alternantibus, sup. cost. transeuntibus; sutura impressa; costis elevatis, angustis, in ult. anfr. 11; apertura ovata; labro acuto, tenui; canali longo, obliquo, intus purpurascente.* Long. 12. Lat. 5½. Long. canal. 3½.

Shell ovately fusiform, greyish olive; whorls, 6, convex, angular above, elegantly ribbed and peculiarly thickly striate lengthwise, with very fine lamellose striæ; transversely conspicuously lirate, liræ alternating, and passing over the ribs, suture impressed; ribs elevated, narrow, 11 in last whorl, aperture ovate, outer lip thin, acute, canal long oblique, purple within.

In form resembling *T. paiviæ*, Crosse, and *T. hanleyi*, Ang, but easily distinguished by its long canal and peculiar lamellose striations. N. Coast. W. F. Petterd.

No. 2. Ranella epitrema. *n.s. R.t. late ovata, albida, vel pallidissime fulva, ad suturas conspicue profundeque canaliculata; anfr. 6, liratis et nodosis, liris magnis et parvis alternantibus, supra varices transeuntibus; nodis in spira costiformibus, in ult. anfr. 4 series transversalibus; varicibus ad suturas curvatis, in seriem non sequentibus sed aliquantulum a seipsis semotis; apertura ovata; labro conspicuo, marginato, intus dentato, labio reflexo; canali obliquo breve vix recurvo.* Lat. 23. Lat. 16. Mil.

This very remarkable Ranella is distinguished by its deep canaliculate suture which causes the varices to overlap in a singular hooked manner. It does not appear to have any living congeners in any way resembling it and none fossil.

No. 4. Mitra franciscana. *n.s. M.t. anguste ovata, sub-turrita, solida, alba, late pallide castanea fasciata (ult. anfr. fasc. 2) vix nitente—anfr. 7, declivis tenuiter convexis, spiraliter multi-liratis, liris regularibus, subdistantibus, et costis obsoletis longitudinalibus decussatis—apertura spira vix æquanti, anguste ovata, sutura bene impressa, labro acuto, columella solida, oblique triplicata.* Long. 20. Lat. 7. Long apert. 9. Lat. 2. Mil.

Shell narrowly ovate, sub-turretted, solid, white, with a broad pale chestnut band (two on last whorl) scarcely shining; whorls 7 sloping, slightly convex, spirally multi-lirate; liræ regular, sub-distant, and decussate with obsolete longitudinal ribs; aperture scarcely equalling the spire, narrowly ovate; suture well impressed, labrum acute, columella solid, obliquely triplicate. Tamar Heads. W. F. Petterd. Obs. Agreeing in form, size, and general habit with *M. badia* and other similar Australian forms, but differing in being strongly decussate. Most of our Mitras are smooth.

No. 5. Mitra granatina. *n.s. M.t. fusiformé-turrita, nitente, castanea, pallide zonata; anfr. convexis, vix rotundatis, regulariter costatis et sulcatis; costis parvis, granosis, in ult. anfr. 18; interstitiis cancellatis (i.e., transversim striatis, sulcatis, et longitudinaliter subtillissimé striatis); apice sub-acuto; spira ult. anfr. æquanti; apertura angusté pyriformi; labro arcuato, tenui; columella triplicata, solida.* Long. 19, lat. 10. Long. apert. 12. Lat. $3\frac{1}{2}$ mil.

This unique specimen was in the collection of Mr. Ronald Gunn who had obtained it from the North Coast. It was labelled with the above name by W. Swainson and marked with his initials, though I cannot find that he ever described it. In shape it is not unlike our common Mitra, except that the spire and last whorl are about of equal length. Its shining, almost enamelled appearance and close granulose fine ribs distinguish it from all other Tasmanian forms.

No. 6. Marginella stanislas. *n.s. M.t. parva, elliptica, polita,* *nitente, pellucida, alba, vel quadrizonata maculis fulvis varie interruptis; spira vix exserta, obtusa; apertura angusta, antice latiore et emarginata; columella antice oblique quadriplicata, labro vix incrassato.* Long. 6, lat. $2\frac{2}{3}$ mil.

Shell small, elliptical, polished, shining, pellucid white or marked with four zones of variously interrupted brown spots, spire scarcely exserted, obtuse, aperture narrow, wider and emarginate anteriorly, columella obliquely quadruplicate, lip scarcely thickened. Blackman's Bay. W. F. Petterd and Legrand. The zones of color and absence of any determinate spire and the thin lip distinguish this shell.

No. 7. Conus carmeli. *n.s. C.t. oblongo-rhombiformi, tenui, nitente, alba, una linea pallide rufo maculata zonata; anfr. 8, tenuiter spiral. liratis, liris acutis, interstitiis long. striatis; spira brevi ad suturas canaliculatis et liratis; 2 ult. anfr. tuberculato coronatis; nucleo mammilato, apertura lineari, labro acutissimo.* Long. 22, lat. 9.

Shell oblong, rhombiform, thin, shining, white, zoned with one pale red spotted line; whorls 8, finely spirally lirate; liræ acute, interstices striate lengthwise; spire short, canaliculate and lirate at the sutures, two last whorls tuberculately coronate; nucleus mammilated, aperture linear, labrum very acute. North coast. W. F. Petterd.

Conus tasmanicus. *Mihi (vide* Proc. 1875). This name being preoccupied by Sowerby I propose the name *C. macleayana* for my species as a slight acknowledgment of the great services rendered to natural science in Australia by the learned President of the Linnean Society of New South Wales.

No. 8. Columbella xavierana. *n.s. C.t. elongato fusiformi turrita, spira quam apertura longiore, conica, apice acuto, lævi, polita, strigis obliquiis, albis, et castaneis latis et undulosis eleganter variegata; sutura subcanaliculata; anfr. 8, planatis; apertura ovata, labro crasso, labio inconspicuo; columella conspicue striata.* Long. 12, lat. 4 mil.

A rather long smooth shell, conspicuously flamed with undulating chestnut longitudinal broad lines of color which under the lens are sometimes seen to be flecked with white. The genus is, however, so variable in the matter of color that it may be only a variety of some already described. N. coast. W. F. Petterd.

No. 9. Columbella miltostoma. *n.s. C. t. parva, ovata, spira, conica acuta, lævi, nitente, alba; anfr. 6, planatis, ultimo tumido; sutura obsolete marginata; apertura spira æquanti, ovata, eleganter rufo marginata; labro incrassato intus conspicue dentato; labio reflexo, tuberculato; columella spiraliter striata, striis 4, ad labrum posticum pertingentibus.* Long. 6, lat. $3\frac{1}{2}$.

A small white smooth tumid species easily distinguished by its mouth, which is delicately margined with red. The labrum is thickened and conspicuously toothed within. N. coast. W. F. Petterd.

No. 10. Ancillaria marginata. *Var-tasmanica. A.t. ovato-fusiformi, solida, spira pyramidali, quam apertura breviore, obtecta, spiraliter bicarinata, undique alba, anfr. ventricosis, balteo calloso albo superne marginatis: ultimo anfr. antice balteis sic compositis ornato—primo 2 striis æquidistantibus spiralibus, deinde varice crasso, lato, rotundato, deinde balteo, lato, planato, tandem* 4-5 *plicis spiralibus; labio sub-acuto, tenui; labro postice calloso; apertura lata, basi late emarginata.* Long. 40, lat. 19. Apert. long. 24, lat. 9.

This species is a smaller white variety of *A. marginata*, Lam., at least so it appears to me, for the forms closely resemble each other. In Sowerby's Thes. Con. Ancil., pl. 3, fig. 47, the above variety appears to be figured. King's Island, Bass' Strait, and Circular Head. W. F. Petterd.

No. 11. Cominella tenuicostata. *n.s. C.t. tenui, ovata, acuta, subturrita, longitudinaliter confertim plicato-costata, liris minutis confertissimis æquidistantibus cincta; pallide lutea, maculis fulvis plus minusve nebulosa; anfr. 7, convexis, superné subangulatis, declivis; ultimo circiter $\frac{3}{5}$ totius testæ æquante; costis latis, subdeclivis, in ult. anfr. 14-16, lævibus, aut vix liratis, interstitiis æquantibus; apice naticiforme, (2 vel. $2\frac{1}{2}$ anfr.); sutura sat impressa; cauda brevi, truncata, labro acuto, paulatim expanso, columella concava, planata, et retro spiraliter sulcata, apertura late ovata.* Long. 21, lat. 11.

A somewhat turretted, very closely ribbed shell with fine spiral striæ very distinct in the interstices, of yellow color and light brown cloudy spots. It has only as yet been found at Eagle Hawk Neck, and was placed in my hands by Mr. W. Legrand.

No. 12. Purpura propinqua. *n.s. P.t. "P. littorinoides" simillimi, sed major et crassior, magis depressa, late ovata, apice semper decollata; anfr. 4, ad angulum unicarinatis, spiraliter, 6-costatis, costis lamellosis interstitiis paulo superantibus; spatio inter carinam et suturam oblique corrugato striato; ult. anf. indistincte plicato, fauce fulva.* Long. 13, lat. 8, mil.

This shell so closely resembles my *P. littorinoides*, that no better description can be given than to say that it is broader, shorter, with fewer whorls, and the spiral liræ become six stout corrugated ribs with a corrugated one at the angle. The aperture is fulvous. It is intermediate between the species just mentioned, and Mr. Angas's *P. flindersii* of Spencer's Gulf, South Australia. The difference may be due to climate. I am not aware if *P. littorinoides* is found on the N. coast. Future observers must solve the question of the specific distinction of these three shells which are different enough at their various stations, many hundred miles apart, but may possibly graduate one into another as they are traced north or south.*

North West Coast extremely abundant on the rocks at low water. W. F. Petterd.

No. 13. Pleurotoma philipineri. *n s. P.t. elongato-ovata, turrita, solidiuscula, nitente, pallide castanea, ad suturas fulvo punctata; spira conica, quam apertura paulo longiore; anfr. 9, convexis, declivis superne angulatis et canaliculatis, ad angulum et suturam granulosis, undique spiraliter liratis et long. tenuissime striatis, liris latis, rotundatis; interstitiis 2-3 lirulis instructis; apice acuto nucleo lævi rotundato; apertura late ovata, labro acuto, sinuato, profundo; labio reflexo, albo; fauce polita; canali brevi, vix recurvo. Granis ad angul. latis. numerosis.* Long. 34, lat. 15. Long. apert. 15, lat. 8 mil.

Shell elongately fusiform, ovate, turretted, rather solid, shining, pale chestnut, at the suture dotted fulvous; spire conical a little longer than the aperture; whorls 9, convex, sloping, angular above and canaliculate, granular at the angle and sutures; spirally lirate and very finely striate lengthwise all over the test; liræ broad, rounded; interstices furnished with 2 or 3 lirulæ; apex acute, nucleus smooth rounded; aperture widely ovate, labrum acute, sinus broad and deep, lip reflected, white, throat polished, canal short, scarcely recurved. The granules at the angle wide and numerous. N. W. Coast. W. F. Petterd. Obs. A very large species closely allied to many of our tertiary forms.

No. 14. Drillia incrusta. *n.s. D.t. parva, fusiforme-turrita, angusta, solida, badia? (alba fere undique incrusta) anfr. 7, convexis, carinatis et costatis; costis 8-9 latis, rotundatis, elevatis; carinis 2-3, (ult anfr. 7-8) supra cost. transeuntibus; interstitiis spiraliter subtillissime concinne striatis; apertura ¼ long. testæ, angusta; labro extus varicoso, marginem versus acuto; sinu omnino postico, conspicuo.* Long. 7, lat. 3 mil.

Shell small, fusiformly turretted, narrow, solid brown? (almost always encrusted with white), whorls 7, convex, keeled and ribbed; ribs 8 to 9 broad, rounded raised; keels 2-3 (in the last whorl 8-9 passing over the ribs; interstices, spirally very finely and neatly striate; aperture ¼ the length of the shell, narrow; outer lip varicose outside but acute towards the margin; sinus entirely posterior and conspicuous. Blackman's Bay and N. Coast. W. F. Petterd.

No. 15. Drillia minuta. *n.s. D.t. minuta, fusiforme turrita, elongata, tenui, rufo-castanea saturata; anfr. 6, (apice incluso) convexis, spiraliter multi-carinatis, inter carin, tenuiter crebre longitud. liratis; apice (2 anfr.) subinflato, spiraliter æqualiter striato;*

* Since writing the above I have found *P. littorinoides* in Port Phillip, Western Port, Apollo Bay, Loutit Bay, all in Victoria. Some specimens had a Nassa-like mouth, that is, teeth on the outer lip. I think a new genus should be erected for the species.

apertura quam spira breviore, elongato-ovata, labro tenui, sinuato; labio inconspicuo, canali brevi. Long. 3, lat. 1 mil.

Shell minute, fusiform, turretted, elongate, thin, saturated a reddish chestnut, whorls including the apex 6, convex, spirally many keeled, between the keels thickly and slenderly longitudinally lirate; apex of two subinflated whorls which are spirally and equally striate; aperture shorter than the spire, elongately ovate, outer lip thin sinuous, inner lip inconspicuous. Long Bay. Rev. H. D. Atkinson.

No. 16. Drillia weldiana. *n.s. D.t. pyramidate-fusiforme, turrita, spira quam apertura longiore, crassa, polita, late fulvo zonata et nebulosa; anfr. 7, crebre oblique costatis et subtillissime cancellatis; costis superne per sinum depressis; apice acuto, apertura anguste ovata; postice tuberculo albo conspicuo, insignito, labro extus valde incrassato, labio reflexo, canali breve, acuto, columella retro oblique lirata.* Long. 25, lat. 10 mil. North coast. W. F. Petterd. Only one specimen found.

Shell pyramidal, fusiform, turretted, spire longer than the aperture, thick, polished, broadly zoned and clouded with brown, whorls 7, closely, obliquely ribbed and very finely cancellate, ribs depressed above by the sinus, apex acute, aperture narrowly ovate and distinguished by a conspicuous posterior white tubercle, outer lip very much thickened outside; lip reflected, canal short, acute, columella obliquely lirate behind.

This somewhat large and peculiar *Drillia* is remotely allied to *Pleurotoma fucata*, Reeve, the habitat of which he does not give.

No. 17. Mangelia st. gallæ. *n.s. M.t. parva, elongato-fusiformi, turrita, pallide fulva, eleganter albo fasciata; anfr. 9, convexis, superne angulatis, regulariter long. costatis, costis elevatis, distantibus (ult. anf. 9); in spira bicarinatis, et lineis confertissimis sup. cost. transeunt. concinne inter carinas spiraliter striatis; apice lævi (3 anfr.) rotundato; apertura spira vix æquanti, ovata, labro acuto, sinu postico, lato; columella retro oblique striata.* Long. 7, lat. 2½.

Var ? benedicti. *Sine carinis, striis et fasciis albis irregulariter cincta brevior et solidior.*

Shell small, elongately fusiform, turretted, pale fulvous, elegantly banded with white; whorls 9, convex, angular above, regularly ribbed lengthwise, with raised distant ribs, 9 in last whorl; bicarinate in the spire, and spirally striate between the keels, with very close, neat lines, which pass over the ribs; apex smooth and rounded, of 3 whorls, aperture scarcely equalling the spire, ovate, lip acute with a posterior broad sinus, columella obliquely striate behind. Variety? *M. benedicti*, without keels, but irregularly girdled with striæ and white bands. Long Bay, Rev. H. D. Atkinson; N.W. Coast, W. F. Petterd.

No. 18. MANGELIA DE SALESII. *n.s. M.t. parva, elongato-fusiformi turrita, albida, pallide lutea et irregulariter, albo et fulvo zonata, solida; anfr. nucleo incluso 7, convexis oblique eleganter crebre costatis et creberrime spiraliter liratis; costis in ult. anfr. 14, rotundatis subelevatis; liris parvis, distantib. subelevatis, regular. sup. cost. trans.; apice 2 anfr. lævi, elongato; sutura profunda; apertura* ⅓ *long. testæ, ovata, labro incrassato, intus conspicue dentato, sinu lato, conspicuo, postico; canali longiusculo; columella inconspicua, retro fulvo intensiore et crebre oblique lirata.* Long. 7, lat. 3.

Shell small, elongately fusiform, turretted, whitish, pale yellow, and irregularly zoned, with white and fulvous, solid; whorls, including the nucleus 7, convex, elegantly thickly obliquely ribbed, and thickly spirally lirate; ribs in last whorl 14, rounded, subelevate; liræ small, distant, subelevate, regular, passing over the ribs; apex of two whorls, smooth, elongate; suture deep; aperture ⅓ length of shell, ovate, lip thickened, conspicuously dentate within; sinus broad, conspicuous, posterior; canal somewhat long; columella inconspicuous, a more intense fulvous behind, and thickly obliquely lirate. Long Bay, 5 fathoms, Rev. H. D. Atkinson. Obs. Distinguished by its stouter habit, closer ribs, regular transverse liræ, and toothed outer lip. Two specimens, one a dead shell with the liræ somewhat irregular. Also Islands, Bass Straits, Petterd.

No. 19. DAPHNELLA TASMANICA. *n.s. D.t. parva, tumide ovata, albida? tenui, opaca; anfr. 6, convexis, subangulatis, concinne carinatis, carinis parvis rotundatis, elevatis, et liris regular. distant. parvis eleganter cancellatis; carinis ult. anfr. alternantibus; sutura profunde impressa; apice obtuso, cancellato; apertura late ovata; labro tenui, postice profunde sinuato; labio inconspicuo, columella longa, contorta, canali breviore.* Long. 6, lat. 3.

Shell small, tumidly ovate, whitish, thin opaque, whorls 6, convex, subangulate, neatly keeled, keels small, rounded, elevated; and elegantly cancellate, with regular distant small liræ; keels in the last whorl alternating; suture deeply impressed, apex obtuse, cancellate, aperture widely ovate, labrum thin, deeply sinuated posteriorly; lip inconspicuous, columella long, twisted, canal somewhat short. Long Bay, Rev. H. D. Atkinson; and Blackman's Bay, Petterd.

No. 20. DAPHNELLA VARIX. *n.s. D.t. ovata, utrimque attenuata, solida, partim transhucida, alba, castanea pallidissime nebulosa, polita; anfr. 6, convexis, in spira regular. costatis, costis numerosis, obliquiis, nitentibus; interstitiis regular. et distant. striatis, striis latis sup. cost. non trans.; ult. anfr. valde longiore, obsolete tantum costato sed valide striato; spira obtusa, apice depresso; apertura elongata, ovata, utrimque acuta; labro incrassato, varicoso, extus pallidissime lutea postice inconspicue sinuato, columella arcuata, antice attenuata.* Long. 13, lat. 6. Long. aper. 7½, lat. 2. Long. ult. anf. 10.

Shell ovate, attenuate each way, solid, partly translucent, white, clouded with very pale chesnut, polished; whorls 6, convex, regularly ribbed in the spire, ribs numerous, oblique, shining; interstices regularly and distantly striate, striæ broad, not passing over the ribs; last whorl much longer than the others, only obsoletely ribbed, but validly striate, spire obtuse, apex depressed, aperture elongate, ovate, acute each way; labrum thickened, varicose, very pale yellow outside, sinus posterior, inconspicuous, columella arcuate, attenuate, anteriorly. Tamar Heads, R. M. Johnston. Obs. A single specimen somewhat worn. Much the appearance of a *Marginella* seen from behind.

No. 21. SIPHONALIA CASTANEA. *n.s.* *S.t. parva, elongato fusiformi, turrita, lævi, nitente, castanea saturata et obscure badia zonata; anfr. 7, convexis, declivis, conspicue costatis (ult. anfr. 7) costis altis, latis, medio convexis, lævibus, in spir. continuis lineis subobliquiis; sutura impressa; apertura $\frac{1}{3}$ long. testæ; labro simplici, canali brevi obliquo, labio reflexo, columella antice canaliculata.* Long. 11, lat. 4.

Shell small, elongately fusiform, turretted, smooth, shining, saturated with chestnut colour, and obscurely zoned with brown; whorls 7, convex, sloping, conspicuously ribbed, ribs 7 in last whorl, high, broad, convex in the middle, smooth, continuous in a sub-oblique line along the spire; suture impressed; aperture $\frac{1}{3}$ length of shell; labrum simple; canal short oblique; lip reflected; columella anteriorly canaliculate. N.W. Coast, W. F. Petterd. Smaller, and more turretted than any of the four described Australian and Tasmanian species. Color, a uniform deep chestnut, on which the zone of brown is not easily seen.

No. 22. SIPHONALIA PULCHRA *n.s.* *S. parva, subpellucida, albida, nitente; fusiforme-turrita; anfr. 8 superne obtuse angulatis, convexis, declivis, crebre eleganter costatis (costis ult. anfr. 18) interstitiis æquantib. et regulariter liris clathratis; liris parvis, validis ad sutur. parviorib., supra. cost. transeuntib; sutura bene impressa et linea castanea lata ornata; apert. quam spira breviori, ovata; labro-tenui, simplici; columella contorta; basi concava, lirata, castanea; canali subelongato, antice fulvo tincto, apice subinflato lævi.* Long. 7, lat. $3\frac{1}{2}$ mil.

Shell small, subpellucid, whitish, shining, fusiformly turretted; whorls 8, obtusely angular above, convex sloping, closely and elegantly ribbed; ribs in last whorl 18, equalling the interstices, and regularly latticed with liræ, liræ small valid, smaller at the sutures, passing over the ribs; suture well impressed, ornamented with a broad chestnut line; aperture shorter than the spire, ovate, outer lip thin, simple, columella twisted; base concave, lirate, chestnut; canal subelongate, anteriorly tinted fulvous brown, subinflated and smooth. A very elegant species. Chappell Island, Bass Strait. Legrand.

No. 23. CERITHIOPSIS ALBOSUTURA. *n.s. C.t. elongata, pyramidali, carinata, badia saturata, marginibus spiræ planatis, suturis impressiis, marginatis, et peculiariter albo lineatis, quasi lanugeris; anfrac. 9; nucl. ? (decollatis) radiatim creberrimé liratis; liris minutis, inter carinulis tantum et supra non transeuntibus; carinis tribus, spiralibus, levibus, rotundatis, haud extantibus, supra paulo pallidioribus, interstitiis æqualibus, concavis; basi vix concava, radiatim et undulatim sulcata; columella recta, spiraliter retro plicata; canali brevi, aperto; labro tenui, tenuiter undulato.* Long. 12, lat. 2½ mil. Islands in Bass' Straits. W. F. Petterd.

There is a tricarinate dark brown species of this genus in the West Indies, *C. terebellum*, C. B. Adams; and one from the Mediterranean, *C. trilineatum*, Phil., which resemble the above very closely. Considering what we have learnt from deep sea dredging as to the wide range of species, these three may possibly be the same. *C. trilineatum* is a little swollen on the spire. The special peculiarity of this species is the white suture which is more like a white cottony incrustation than a coloring of the substance of the shell, and this appearance occurs at intervals in the interstices between the keels.

No. 24. TURRITELLA TASMANICA. *n.s. T.t. parva, acuminato turrita, alba tenui; anfr. 11, angulatis, carinatis et subtillissime valde sinuoso-striatis; carinis præcipuis, 2, sed parvioribus instructis; interstitiis striis spiralibus, tenuibus æquidistantibus cinctis; basi convexa, spiraliter lirata, apertura quadrata; columella alba, encausta. bene definita.* Long. 13. lat. 4, mil.

Shell small, acuminate, turretted, white thin; whorls 11, angulate and keeled, and with very fine widely sinuated striæ; principal keels 2, but furnished with smaller ones, the interstices girdled with fine equidistant spiral striæ; base convex, spirally lirate, aperture quadrate, columella white, enamelled, and well-defined. Long Bay, Rev. H. D. Atkinson. Obs. Differing from *T. sinuata*, Reeve (Icon. pl. II. fig. 62), in the whorls and prominent keels besides being smaller and destitute of color. I suppose that the mouth is sinuous from the striæ, but no specimen with a perfect labrum has been seen by me.

No. 25. DENTALIUM TASMANIENSIS. *n.s. D.t. parva, solida, alba. gracile, lente crescenti, vix curvata, æqualiter 8 costata, interstitiis aliquando subcostatis, apice integro.* Long. 10½, lat. 1½. Lat. apicis ⅓ mil. North West coast. W. F. Petterd.

This is a gracefully tapering shell, curved slightly, with valid ribs and often smaller ones in the interstices.

No. 26. DENTALIUM WELDIANA. *n.s. D.t. parva, subcylindrica, nitente, albida, subpellucida, vix curvata, obsolete æqualiter costata, apice integro.* Long. 10 *(decoll),* lat. 1½. Lat. apicis 1. North Coast. W. F. Petterd.

An almost cylindrical shell, sub-pellucid and shining with obsolete ribs.

No. 27. Phasianella pulchella. *n.s.* *P.t. minuta, tumide ovata, apertura quam spira longiore, lævi, nitente, polita, intense olivacea, lineis tenuibus, distantibus, regularib. maculatis cincta, et flamulis latis albis, castanea nebulosis a suturis procedentibus ornata ; apertura late ovata, labro tenui ; columella alba, conspicue linea olivacea, maculata, marginata : basi convexa, punctis lineata operculo cæruleo albo, extus lævi, nitente, tumide convexo.* Long. 3½, lat. 2 mil.

Shell minute, tumidly ovate, aperture longer than the spire, smooth, shining, polished, intense olive with girdles of fine regular distant spotted white lines, and ornamented with broad flames of clouded chestnut proceeding from the sutures, aperture broadly ovate, lip thin, columella white conspicuously margined with a spotted olive line ; base convex with punctate lines; operculum bluish white, smooth shining and tumidly convex outside. Long Bay, 3 fathoms, sand. Rev. H. D. Atkinson. Two specimens of this elegant species were found, in both of which the operculum was *in situ*. The coloring was constant, but in all the genus this varies almost infinitely. There is a small species described by Angas, *P. rosea*, which is rose red. Still, the above may possibly be a variety.

Turbo (ninella) straminea. *Martyn*. A small variety of this shell was found by Mr. Gunn on the N. Coast. As the species is known to vary very much, and is thus identified with *T. torquatus*, Gmel. and *T. lamellosus*, Brod , I may mention that Tasmanian specimens are small, and vary from all the above types. There is a strong rounded keel on the lower whorls which are black spotted ; the mouth is slightly angular at the keels, the summit of the whorl tuberculate and the suture channelled. Diam. 20 Alt. 17, mil. The operculum has two spiral ridges, not unlike the convolutions of the human ear.

No. 28. Turbo (Lunella) Simsoni. *n.s.* *T.t. parva, turbinata, solidiuscula, anguste umbilicata, superne depressa, basi convexa, olivacea, strigis nigris rufisque numerosis radiatim variegata ; anfr. 4, ad suturas conspicue fimbriatis, transversim tenuissime confertissimeque striatis ; anfr. ult. medio late planato, carinato, superne fimbriato, ad periphæriam acute angulato ; apertura rotundata, fauce argentea, margaritacea, labio acuto, triangulato, anguste ceræuleo marginato ; columella alba, planata, et subtuberculata, antice acuta ; operculo calcareo, albo interne planato et regulariter, multispirale, extus valde convexo in medio, margine planato.* Long. 9, lat. 12 mil.

This shell is closely allied to our *T. undulatus*, Chem., but is much smaller, and has hitherto been confounded with it. Its smaller size, the red and black flammules, and the peculiar raised rounded carina on the upper edge of the last whorl which continues round the suture as a kind of hem, easily distinguish it. If I mistake not I have found it myself in

Robe., South Australia, and then imagined it to be the young of *T. undulatus*. I am now of opinion it is a full grown shell from specimens brought to me by my industrious friend and collector, Augustus Simson, to whom I have dedicated it. Common at George's Bay Heads, A. Simson; and Blackman's Bay, W. F. Petterd.

No. 29. CARINIDEA TASMANICA. *n.s. U.t. parva, orbiculata, valde depressa, anguste, umbilicata, tenui, sordide virente, aliquando albida nitente sed sæpius rosea incrusta; anfr. 5, obsolete oblique costatis et striatis, ad periph. conspicue carinatis, carina acuta, undulosa, irregulariter dentata; apert. circulari, fauce margaritacea, labio medio acute sinuato, labro arcuato conspicue reflexo, umbilico partim obtegente, basi convexa tuberculis obsolete ornata. Operculo calcareo, extus spirale albo nucleo castaneo; ult. anfr. convexo incrassato.* Mag. diam. 8, min. 7, alt. 4.

Shell small, orbicular greatly depressed, narrowly umbilicate, thin, sordidly green, sometimes whitish shining, but often encrusted with a rose coloured nullipore, whorls five obsoletely obliquely ribbed and striate, conspicuously keeled at the periphery, keel acute, undulose, irregularly toothed, aperture circular, throat pearly, lip acutely sinuate in the middle, inner lip arcuate, conspicuously reflected, partly covering the umbilicus, base convex ornamented with obsolete tubercles, operculum calcareous, spiral outside white, with a chestnut nucleus, and the last whorl convex and thickened. Common on the east and south coasts, and probably South Australia. I have always hitherto regarded this as a young variety of *Trochus aureus*, Jonas (*Labio*), but the form is so constant and so very distinct that I have decided on describing it a distinct shell. Careful observations on its growth can alone settle its position finally. The operculum is nearly always *in situ*.

No. 30. GIBBULA MULTICARINATA. *n.s. G.t. parva, orbiculata, subdepressa, solida, nitente, pallide castanea, fulvo punctata et nebulosa; anfr. 4, carinatis et liratis, (carinis in ult. anfr. 4); interstitiis liratis; carina ad peripheriam majuscula; ad suturam granosa et regulariter fulvo punctata; apice albo, lævi; basi convexa, subdistanter lirata; umbilico spiraliter striato, albo marginato; apertura subquadrata; labro producto, tenui; columella crassiuscula, obsolete tuberculata.* Maj. diam. 8, min. 6, alt. 5½ mil.

A small orbicular, depressed solid shell, shining and pale chestnut in colour, but more or less spotted and clouded with brown; whorls four, keeled and lirate (four keels in the last whorl); interstices lirate; keel at the periphery somewhat larger; granular and regularly brown spotted at the suture; apex white, smooth; base convex, rather distantly lirate; umbilicus spirally striate with a white margin; aperture subquadrate; outer lip produced, thin; columella rather thick and obsoletely tuberculate. N. W. Coast. R. Gunn. Differing from *G. coxi*, in its smaller size, smooth shining habit and colour.

No. 31. Gibbula dolorosa. *n.s. G.t. parva, turbinato-conoidea, solida, lirata, subnitente, atro-purpurea, apice margaritace, rosea ; anfr. 4-5, convexiusculis, liris latis, rotundatis, æqualibus cinctis, et transversim oblique obsolete, striis incrementi decussatis ; basi convexa, lirata, purpurea ; umbilico angusto, perpendiculariter striato ; apertura rotundata, splendidé iridescenti ; intus lirata ; columella marginata.* Diam. maj. et alt. 7.

A somewhat tumidly conical small solid shell, umbilicate and lirate, specially distinguished by its blackish purple hue, while the apex is pearly and rose colour. The mouth is splendidly iridescent, and the columella is marginate. Bass' Straits. W. H. Petterd. Rare.

No. 32. Gibbula weldii. *n.s. G.t. parva, depresso-turbinata, carinata, sub-late umbilicata, solida, nitente, albida, lineis obliquis tenuibus et maculis fulvis eleganter ornata ; anfr. 5, quadratis, superne et infra carinatis, carinis rotundatis, elevatis, maculis fulvis conspicuis, undique (carinis exceptis et ult. anf. inter carinas) liratis ; apice obtuso basi planata, striata, lineis roseis radiata ; apertura rotundata, peristoma continua incrassata ; columella arcuata, conspicua, umbilico marginato, margine alba, et intus liris spiralibus et æqualibus insignito.* Long. 7, lat. 6½, alt. 6.

A small depressedly turbinate shell, white shining and porcellanous, keeled and lirate throughout except on the keels and on the last whorl between them. It is prettily marked with brown spots on the keels and fine diagonal lines of the same colour on the whorls ; on the base, which is lirate, it is radiately marked with fine rose lines. The umbilicus is white margined and spirally lirate. Rare. Bass' Straits. R. C. Gunn.

This shell may turn out to be *G. porcellana.* A. Adams, Zool. Proc. 1851, p. 186, sp. 28, but I had no specimens of the latter for comparison.

No. 33. Margarita (minolia) tasmanica. *M.t. orbiculato turbinata late et perspective umbilicata, pallide rufa et nebulis albis variegata, insuper maculis roseis, minimis, angulatis indistincte cincta ; anfr. 5 rotundatis, rapide crescentibus, creberrime tenuissimeque transversim sulcatis, et long. oblique striatis ; apice subexserto, acuto ; peripheria obtuse angulata ; basi convexiuscula, striata ; umbilico simplici, peramplo, spira ad apicem patefaciente ; apertura rotundata ; peristoma vix continua tenui.* Maj. diam. 9, min. 8, alt. 5.

Shell orbicularly turbinate, widely and perspectively umbilicate, clouded with pale red and white, and indistinctly zoned with small pale angular rose spots ; whorls 5, rounded, rapidly increasing, thickly and finely spirally grooved, and transversely obliquely striate ; apex somewhat exserted and acute, periphery obtusely angulate ; base rather convex, striate, umbilicus simple, ample, showing the interior of the spire to the apex, aperture rounded, peristome thin and not quite continuous. Bass' Straits, R. Gunn. Long Bay, Rev. H. D. Atkinson Not common.

There is a shell somewhat like this in Dr. Cox's collection marked *M. pulcherrima*, but without any reference. It differs from *M. tasmanica* by the raised liræ being connected by innumerable fine close transverse riblets. It comes nearest to the New South Wales *M. angulata*, Adams, of which it may possibly be only a variety, but the upper part of the whorls are not angular. Color cannot be relied on as it is very variable in the genus.

No. 34. CLANCULUS DOMINICANA. *n.s. C.t. parva, depressa turbinata, late umbilicata, solidiuscula, atro-badia obscure maculata et nebulosa ; anfr. 6, convexiusculis, 5 carinis granosis cinctis, interstitiis liratis, oblique crebre concinne striatis, striis supra liras (non gran.) transeuntib. ; apertura oblique quadrata ; labro intus incrassato, fauce margaritacea, columella obsolete unidentato, sub-reflexo ; umbilico albo, levi ; basi planata, spiral. lirata, liris lævibus.* Maj. diam. 10, min. 8, alt. 7½ mil.

Shell small, depressed, turbinate, broadly umbilicate, rather solid, bluish brown and obscurely spotted and clouded ; whorls 6, rather convex, obliquely, thickly, and neatly striate, striæ passing over the liræ but not over the granules, aperture obliquely quadrate, lip thickened within, throat pearly, columella obsoletely unidentate subreflected, umbilicus white, smooth ; base flattened spirally and smoothly lirate. South coast. Rare. W. F. Petterd. Differs from known species in the smoothly lirate base and the absence of tubercles round the lip, columella or umbilicus.

No. 35. CLANCULUS RAPHAELI. *n.s. C.t. parva, depresso conica, solidiuscula, atro-olivacea, ad suturas autem albo tessellata ; anfr. 4-5, planatis, liris spiralibus, irregularibus, granulosis cinctis, aliquando alternantibus, aliquando lineis granulosis, minutissimis, intercalantibus : granis in margin. anfr. majoribus ; undique lineis obliquis transversalibus instructis ; ult. anfr. ad peripheriam sub acute angulato ; sutura canaliculata ; basi planata, lineis granulosis spiralibus et striis obliquiis ornata ; umbilico albo ; apertura quadrata, argentea, margaritacea, conspicue lirata, columella lata, antice conspicue tuberculato, labro dentato.* Maj. diam. 6, min. 5½, alt. 6.

Shell small, depressedly conical, rather solid, blackish olive but tessellated with white at the sutures ; whorls 4-5 flattened, girdled with irregular spiral granulose liræ, sometimes alternating and sometimes with minute granulose lines intervening ; granules larger at the margins ; shell universally covered with minute transverse oblique lines, last whorl sub-acutely angular at the periphery ; suture canaliculate, base flattened ornamented with spiral granulose lines and oblique striæ. George's Bay, Simson ; and Long Bay, W. F. Petterd.

No. 36. CLANCULUS ANGELI. *n.s. C.t. parva, turbinata, depressa, orbiculari, solidiuscula, sordide alba et rufo nebuloso, undique irregulariter carinata, interstitiis tenui irregulariter concinne oblique liratis et peculiariter* *punctatis; carinis majoribus lævibus vel obsolete granosis; anfr. 5, convexis, ult. obtuse angulato, basi plana vel leviter convexa, spiral. lirata, liris æqualibus et badia punctatis; interstitiis transversim concinne striatis; apertura subquadrata, labro crebre dentato, fauce intus conspicue lirata; columella obtuse unidentata, margine umbilici regulariter tuberculato tuberculis, granosis rotundatis.* Maj. diam. 6 min. 5½. Alt. 5 mil.

Shell small, turbinate, depressed, orbicular, rather solid, sordid white and clouded red, irregularly keeled all over, with the interstices finely, irregularly, neatly, obliquely lirate, and peculiarly punctate; larger keels smooth or obsoletely granular; whorls 5, convex, last obtusely angular; base flat or slightly convex, and spirally lirate with equal liræ and spotted brown, interstices transversely neatly striate; aperture subquadrate, lip closely dentate, throat conspicuously lirate, columella obtusely unidentate, margin of the umbilicus regularly turberculate with rounded granular tubercles. Long Bay, 10 fathoms, sand, Rev. H. D. Atkinson; Blackman's Bay, W. F. Petterd.

No. 37. Diloma australis. *n.s. D.t. oblique turbinata, subconica, ad peripheriam obtuse angulata, pallide lutea et lineis pallide fulvis, numerosis, undulose obliquis variegata, subnitente, anguste umbilicata; anfr. 6, vix convexis, obsolete liratis, apertura oblique quadrata; fauce argentea, margaritacea; labro intus incrassato, margine lato conspicuo, postice producto; columella oblique arcuata, haud tuberculata; basi tantillum convexa, tenuiter et regulariter spiraliter lirata; umbilico albo, radiatim striato.* Diam. maj. 16, min. 14, alt. 13.

Shell obliquely conical and turbinate, obtusely angled at the periphery, pale yellow and variegated with numerous pale brown undulating and oblique lines, somewhat shining, narrowly umbilicate; whorls 6, scarcely convex, obsoletely lirate; aperture obliquely quadrate; throat silvery and pearly; lip thickened within with a broad conspicuous margin posteriorly produced; columella obliquely arcuate, not tuberculate; base very slightly convex, finely and regularly spirally lirate; umbilicus white, radiately striate. North Coast. Rare. W. H. Petterd.

I think this shell has been confounded with *Trochocochlea striolatus*, Wood. It is only doubtfully referred to *Diloma* as it has an umbilicus. But the genus itself is a very questionable one.

No. 38. Monilea turbinata. *n.s. M.t. turbinato-conoidea, ad apicem usque perspective umbilicata, carnea-albida, strigis et maculis pallide fuscis nebulosa; anfr. 6, rotundatis, superne obtuse angulatis et subcanaliculatis, spiraliter sulcatis, et liris numerosis (12 circiter) maj. et min. alternantibus, cingulatis; sutura impressa; apice obtuso, iridescente; ult. anfr. ad peripheriam angulato; basi convexa, lirata et tenuiter, spiraliter transversim striata; apertura transverse ovata; labro incrassato, margaritacea, intus lirato; columella brevi, declivi-concava; margine umbilici tricostato, 4 tuberculis terminato.* Long. 18, lat. 20, alt. mil.

Shell turbinately conical, perspectively umbilicate to the apex, fleshy whitish, clouded with pale brown spots and streaks, whorls 6, rounded, obtusely angulate and subcanaliculate above, spirally sulcate, and girdled with numerous (about 12) liræ alternating great and small; suture impressed; apex obtuse and pearly; last whorl angulate at the periphery; base convex, lirate and transversely slenderly, spirally striate; aperture transversely ovate; lip thickened and nacreous, lirate within; columella short, sloping, concave; umbilical margin 3 costate, terminated with four tubercles.

North Coast. R. C. Gunn. Closely allied to *Monilea corrugata* of New South Wales, but more conical, the whorls not granular, umbilicus wider and terminating in four tubercles. Rare.

No. 39. ETHALIA TASMANICA. *n.s. T.t. orbiculari, depressa, umbilicata conspicue radiatim costata, lirata, alba, sparsim rufo punctata; anf. 5, declivi-costatis, costis latis, rotundatis lævibus; ultimo obtusé ad peripheriam angulato, superne 8-costato, interstitiis latis, concavis, transversim liratis, liris 4-5 rufo punctatis; basi valde convexa, spiraliter lirata, liris 5, lævibus; callositate opaca, alba, polita, coarctata, circa umbilicum parvum gyrante; apertura rotundata, intus lirato; labro postice supra peripheriam expanso et subcalloso; columella concava dente acuto terminata; apice rotundato, lævi, polita, convexo.* Maj. diam. 12½, min. 10, alt. 7½.

This is the only shell of this genus found in the Australian seas. Mr. Gunn assured me that he found it on the north coast, or I certainly should have thought a mistake had been made. In the Mazatlan catalogue of the Brit. Mus., p. 250, Mr. Phil. Carpenter says:—"*Ethalia* is a small group of Mazatlan shells of the general aspect of *Vitrinellæ*, and agreeing with *Globulus* in having a callous base differing from the typical sp. of that genus: 1st. In being frequently sculptured; 2nd. In the callus winding round generally not covering the umbilicus; 3. In the outside of the callus not being glossy, but having a glossy portion scooped out near the columella. The labium is generally not reflected over the body whorl. Some of the small white shells described as *Rotellæ* are probably referable to this form. Mr. Cuming states that the species he found were deep water shells, while *Globulus* is littoral.

No. 40 ADEORBIS PICTA. *n.s. A.t. orbiculari, subdepressa, profundé perspective umbilicata, longitud. tenuiter striata, polita, pallidé carnea, lineis 4, parvis, rufo et albo maculatis tenuiter zonata, et nebulis magnis irregularibus, sanguineis variegata; anfr. 5, superne obtuso angulatis, planatis, subcanaliculatis; basi rotundata, subtillissime striata, rufo et albo punctata; apertura rotundata; peristoma supra peripheriam ultimi anfractus valde expansa, callositate ad columellam supra ad labrum continuata; columella antice bituberculata; fauce intus lirato.* Long. 8, lat. 13, mil.

From the collection of R. C. Gunn, and stated to come from the N.W. Coast, but so unlike a Tasmanian shell that this unique specimen suggests a doubt as to the habitat. Its red smooth shining appearance renders it extremely like a *Rotella*, but it has an umbilicus.

No. 41. CYCLOSTREMA JOSEPHI. *C.t. parva, oblique turbinata, crassa, late umbilicata, alba, opaca, pallidissime castanea maculata; anfr. 5, rotundatis, creberrime concinne striatis; sutura impressa, apertura orbiculata, labro crasso, postice producto, columella obliqua, basi rotunda, umbilico oblique striato.* Long. 3, lat. 3, mil.

Shell small, obliquely turbinate, thick, widely umbilicate, white, opaque, spotted with very pale chestnut; whorls 5, rounded, very closely and neatly striate, suture impressed, aperture orbiculate, lip thick, produced posteriorly, columella oblique, base round, umbilicus obliquely striate. Blackman's Bay. W. F. Petterd.

No. 42. CYCLOSTREMA MICRA. *n.s. C.t. minuta, turbinata, alba, polita, lævi, perspective umbilicata; anfr. 5, exacte rotundata, apertura simplici, orbiculata, acuta, haud reflexa.* Diam. 1½ mil., Long Bay. Rev. H. D. Atkinson.

Shell minute, turbinate, white, polished, smooth, perspectively umbilicate, whorls 5, exactly rounded, aperture simple, orbiculate, acute, not reflected.

No. 43. CYCLOSTREMA WELDII. *n.s. C.t. depresso-turbinata, minima, albida, subdiaphana, tenui; nitente, umbilicato; anfrac. 6, depressis, convexis, lævibus; apertura, orbiculata, postice subeversa; umbilico marginato.* Diam. mag. 2. alt. 2 mil.

Shell depressed turbinate, minute, whitish, somewhat translucent, thin, shining, umbilicate; whorls 6, depressed convex, smooth (though there are faint traces of transverse striæ, probably lines of growth): aperture orbicular, somewhat everted posteriorly, umbilicus marginate. Long Bay, 20 fathoms. Rev. H. D. Atkinson.

No. 44. CYCLOSTREMA SUSONIS. *n.s. C.t. minuta, orbiculari, depressa, alba, polita; anfr. 4, rotundatis; spira parum exserta, translucente; apertura simplici, orbiculata, umbilico amplo, haud marginato.* Diam. 1½ mil.

Shell minute, orbicular, depressed, white, polished, whorls 4, rounded, spire slightly exserted, translucent, aperture simple, orbicular, umbilicus ample, not marginate. N. Coast, R. Gunn; and Blackman's Bay, W. F. Petterd. Obs. Minute, much smaller than the preceding, with fewer whorls, and perfectly devoid of ornament.

No. 45. CYCLOSTREMA SPINOSA. *n.s. C.t. minuta discoidea, superne planata vel concava, alba, undique obsolete radiatim striata; anfr. 4, superne acute angulatis, fimbriatis et spinis coronatis; infra rotundatis et conspicue unicarinatis; spinis triangulatis, lamellosis, concavis; umbilico peramplo; apertura rotundata postice conspicue sinuata.* Diam. 2 to 3 mil.

A minute shell, flattened above and unicarinate beneath, easily distinguished by its crown of hollow triangular spines, one of which occurring on the lip causes a deep sinus in the aperture. Long Bay. W. F. Petterd.

No. 46. Cyclostrema immaculata. *n.s. C.t. parva, discoidea, superne planata, alba, undique confertim tenuissime undulose striata; anfr. 4, superne angulatis coronatis et radiatim costatis, infra rotundatis, 2 carinis obsoletis granulosis instructis; umbilico peramplo, margine eleganter dentato; apertura orbiculari, dentata.* Diam. 3 mil.

Shell small, discoid, flattened above, white, thickly, very finely undulately striate all over; whorls 4, angular above, coronate and radiately ribbed, rounded below, and furnished with two rounded obsolete granular keels, umbilicus very ample, with an elegantly dentate margin; aperture orbicular, toothed. Long Bay and Blackman's Bay. W. F. Petterd.

No. 47. Liotia incerta. *n.s. L.t. minuta discoidea depressa, spira omnino plana, tenui, opaca, undique regulariter et tenuiter spiraliter lirata, profunde, late, perspective umbilicata; anfr. 4, biangulatis, regulariter et distanter costatis; costis elevatis, sublamellosis et cucullatis; liris supra cost. transeunt.; apertura tenui, integra, haud incrassata; basi convexa.* Diam. 5 mil. N.B.—*Margaritacea, costis ætate divisis, et rarius spinosis, numerosis.*

Shell minute, discoid, depressed, spire quite flattened, thin, opaque, regularly and finely lirate all over, deeply, widely, perspectively umbilicate; whorls 4, biangulate, regularly and distantly ribbed, ribs raised, sublamellose, and, as it were, hooded; liræ passing over the ribs, aperture thin, entire, not thickened, base convex. Long Bay. Rev. H. D. Atkinson. Obs. The transverse ribs divide in this shell as it grows older, and sometimes are even covered with numerous spines. It is also nacreous, which makes its generic position very doubtful, especially as the mouth is not thickened. I only provisionally class it as a *Liotia*.

No. 48. Fossarus tasmanicus. *n.s. F.t. parva, depressa, suborbiculata, anguste umbilicata, solidiuscula, pallide lutea, carinis spiralibus et liris obliquiis undique conspicue clathrata; carinis elevatis, rotundatis; liris, sublamellosis regularibus, subdistantibus; anfr. 5 angulatis, inter carin. quasi canaliculatis; sutura canaliculata; apertura orbiculata, intus lævi; labio vix reflexo.* Diam. 2 mil.

Shell small, depressed suborbiculate, narrowly umbilicate, rather solid, pale yellow, latticed all over with spiral keels and oblique liræ, keels raised, rounded, liræ sublammellose regular, subdistant; whorls 5, angular, canaliculate between the keels, suture canaliculate, aperture orbicular, smooth within, lip scarcely reflected. Long Bay, Rev. H. D. Atkinson; Blackman's Bay, W. F. Petterd. This shell has characters intermediate between the genera *Euchelus* and *Vanikoro*, but I think belongs more completely to the genus in which I have placed it.

No. 49. Fossarus bulimoides. *n.s. F.t. minuta, ovata, subumbilicata, tenui, alba, subpellucida, undique tenuiter regulariter lirata, transver.*

oblique striata ; apice obtuso ; anfr. 4, rapide crescentibus, convexis, declivibus ; apertura spira aequanti, ovata, postice angusta, labro acuto, labio incrassato, conspicuo. Long. 3, lat. 2 mil.

Shell minute, ovate, subumbilicate, thin white, subpellucid, finely and regularly lirate all over and obliquely transversely striate ; apex obtuse ; whorls 4, rapidly enlarging, convex, sloping ; aperture equalling the spire, ovate, narrowed posteriorly, outer lip acute, inner lip thickened, conspicuous. Long Bay, Rev. H. D. Atkinson.

No. 50. SCISSURELLA ATKINSONI. *n.s. S.t. parva, tenui, pallide lutea vix translucida, haud nitente, oblique suborbiculari, ad basim dilatata, spira minus exserta sed aliquantulum complanata ; anfr 4, vix, convexis, rapidé crescentibus, superné fasciatis, tenuiter cancellatis, basim versus subcarinatis (liris longitud. sub fasc. declivis, supra curvatis) ; sinu inconspicuo, fascia sinus prominente, marginibus elevatis, longitrorsum distanter arcuatim retrorsimque liratis ; fissura elongata, antice attenuata non longe ab ore perforante ; apertura orbiculari simplici ; labro acuto ; labio subreflexo, curvato ; infima facie cavum infundibulifor. ferente.* Long. 2, lat. 1 mil.

This most interesting shell is the first of the genus found in Australian waters. It was dredged from a sandy bottom at six to ten fathoms by the Rev. H. D. Atkinson, and Blackman's Bay, W. F. Petterd. After a careful comparison, I must say that the species is so near the British *S. crispata* that the differences are almost inappreciable. There were only three specimens seen by me, and in all these the slit was closed, and the sinus not perceptible on the lip. The fascia of the sinus does not extend to the two last whorls of the spire. Prof. Morris in his observations on this genus (Moll. Great Oolite, Palæontograph Soc., 1854, p. 81), accounts for the foramen by supposing the animal to keep the siphon stationary during a considerable period of the formation of the shell matter in advance. He says : "When the animal was forming new shell in advance of the aperture, the fissure was not advanced forward with it, but the anal syphon remained in the same position until a considerable progress had been made in the formation of new shell. At length that organ was withdrawn to be protruded from the aper ure and the formation of a new fissure immediately commenced." In this state it shows that the genus *Trochotoma* would be a *Pleurotomaria*. Both genera have been rather arbitrarily separated from *Scissurella* and from each other. In the three specimens submitted to me one had the outer lip broken, and the fissure then was like a *Pleurotomaria*. I separate the Tasmanian species from the British one only to promote further investigation. There is no difficulty in supposing them identical, as we have other instances of British species appearing in Australian seas, while they are utterly unknown in intermediate seas. In the same way in our flora we have many European weeds which do not occur in the intervening countries, and they have for a certainty not been introduced. A *Pleurotomaria* has been described fossil by Prof. M'Coy as from the tertiary beds of Geelong.

No. 51. PARTHENIA TASMANICA. *n.s. P.t. minuta tumide pyramidali alba, subumbilicata ; vertice nucleoso parvo, verticaliter sito, sub-tumente, anfr. 6, conspicue tricarinatis, planatis, et longitud. tenuissime striatis ; carinis elevatis rotundatis ; suturis junctione 2 carin. pæne occultis ideoque carinis infra et supra suturas quasi ex una carina lata confectis ; basi vix convexa, lirata ; apertura pyriformi, integra, labio reflexo. axi plica distincte munita.* Long. $1\frac{1}{2}$, lat. vix $\frac{1}{2}$ mil.

A minute tricarinate shell, dredged in Long Bay by the Rev. H. D. Atkinson. The upper and lower keels of each whorl are so closely united as to appear like one broad one in which the suture is concealed, the mouth is entire, the inner lip reflexed and furnished with a very distinct tooth.

No. 52. ACLIS TRISTRIATA. *n.s. A.t. parva, elongata, pyramidali, turritissima, alba, opaca, lævi, vix nitente ; anfr. 12, conspicue tri-striatis, striis latis ; medio tenuissime concinne long. liratis ; sutura impressa, lira parva instructa ; nucleo, minuto, lævi ; basi convexa ; apertura integra pyriformi, postice attenuata, labro tenui, labio reflexo.* Long. 10, lat. 2, mil. North West Coast. W. F. Petterd.

Shell small, elongate, pyramidal, very much turretted, white, opaque, smooth, scarcely shining; whorls 12, conspicuously tristriate with broad striæ, slenderly and neatly longitudinally lirate in the middle of the whorls, suture impressed, furnished with a small raised line ; nucleus minute, smooth; base convex, aperture entire, pyriform, attenuate posteriorly, outer lip thin, inner lip reflected.

No. 53. SYRNOLA MICHAELI. *n.s. S.t. parva, aciculata, turritissima, lævi, nitente, alba, 2 fasciis castaneis varie interruptis pallidissime zonata ; anfr. 12, planatis ; apice ? (decoll.) apertura semilunata ; labro tenui, producto ; labio reflexo, umbilico simulante, plica tuberculoso.* Long. 8, lat. 2 mil.

Shell small, acicular, highly turretted, smooth, shining, white, zoned with two variously interrupted very pale chestnut bands ; whorls 12, flattened ; apex ? decollated, aperture semilunate, outer lip thin, produced, lip reflected into a false umbilicus, plait tuberculose. North Coast. W. F. Petterd.

No. 54. ELUSA BIFASCIATA. *n.s. E.t. subulata, turrita, tenui, subpellucida, alba, castanea late zonata, zona 2 lineis fulvis marginata, sutura impressa, apice lævi, rotundato ; anfr. 12, convexis, creberrime costatis (ult. anfr. 26), costis validis rotundatis, lævibus, nitentibus, interstitiis æqualibus, intus in spira videtur tenuiter lirata ; apertura integra, pyriformi, labio reflexo, obsolete plicato, labro antice tantillum producto, intus lævi, basi convexa, striata.* Long. 7, lat. $1\frac{1}{2}$. Blackman's Bay. Rare. W. F. Petterd.

The genus *Elusa* was established by Adams for turretted subulate shells with ribs, a plait on the columella and often lirate within. In this species the three last whorls are not lirate within but the upper ones are conspicuously so, as the shell is quite translucent. It is very elegant in form. The band of color bordered by two darker lines is only seen on the last whorl; the suture covers the line on the spire so that there the whorls seem half white and half chestnut with a line of deep coloring on the boundary. It is shining, and the ribs are numerous, 26 in last whorl.

No. 55. TURBONILLA MACLEAYANA. *n.s.* *T.t. elongatissima, turritissima, solidiuscula, alba, nitente; anfr. 15, planatis, oblique costatis; costis (11-14 in ult. anfr.) lævibus, elevatis, rotundatis, a sutura ad suturam attingentibus, interstitiis æquantibus, sutura sat impressa, apertura quadrata, apice ? (decoll.)* Long. 8, lat. 1 mill.

Shell very long and turretted, rather solid, white, shining, whorls 15, flattened, obliquely ribbed, ribs (11-14 in the last whorl) smooth, raised, rounded, reaching from suture to suture, equalling the intervals in size, suture well impressed, aperture quadrate, apex ? (decollated). Long Bay. W. F. Petterd. Easily distinguished by its small size and turretted habit. It appears to me, however, in shells of such uniform character as *Turbonilla*, that we are often dealing with varieties instead of species, and the above may be a case in point. If we knew the conditions of growth in these shells we might decide how far they are dependent on very local nfluences.

CINGULINA AUSTRALIS. *Nobis. (vide Pro. Roy. Soc. Tas., 1875.) Descriptio emendata. Pro. "carinis in ult. anfr. 5, deinde 4, 3, etc." lege "carinis in ultimo anfrac. 5, deinde 3, usque ad apicem." Et pro "basi convexa liris spiralibus (2) elevatis, rotundatis, ornata;" lege "basi convexa, liris spiralibus, elevatis, rotundatis ornata; apice lævi subinflato."*

In the description of the above shell a mistake was made. Instead of "keels in the last whorl 5, then 4, then 3." It should be, "keels 5 in the last whorl, then 3 to the apex." The base is also spirally keeled in continuation of the 5 of the last whorl, and not, as stated, with two spiral rounded liræ. The apex is smooth.

TRIFORIS TASMANICA. *Mihi.* A variety of this shell is found at Blackman's Bay, in which one of the three granulose ribs is represented by a smooth narrow keel, and the last whorl scarcely granular, but with four or five grooves. The shell is very variable, new species should be very cautiously accepted.

No. 56. STYLOPTYGMA TASMANICA. *n.s.* *S.t. parva, elongato-fusiforme, antice rotundata et latiore, lactea, translucente; nucleo hyalino, inflato, rotundato, transverso; anfr. (nucleo excluso) 7, tumidiusculis, politis, obsolete striatis; sutura late marginata, vix obliqua, impressa; apertura pyriforme; plica inconspicua, obliqua.* Long. 4, lat. 1, mil.

Shell small, elongately fusiform, rounded and broader anteriorly, milky white, translucent, nucleus hyaline inflated, rounded, transverse; whorls, exclusive of the nucleus, 7, rather tumid, polished, obsoletely striate, suture widely marginate and scarcely oblique, impressed; aperture pyriform, plait inconspicuous, oblique. Rare. Blackman's Bay. W. Legrand and W. F. Petterd.

No. 57. STYLIFER TASMANICA. *n.s. S.t. parva, pyramidata, lactea, pellucida, lævi, nitente; anfr. 7, convexis, sutura impressa, vix declivi, apertura oblique pyriforme, apice mammilato, sinistrorso, labro producto, incurvo, antice et postice emarginato, labio inconspicuo sed reflexo.* Long. 4, lat. 1½.

Shell small, pyramidal, milky white pellucid smooth, shining; whorls 7, convex, suture impressed scarcely sloping, aperture obliquely pyriform, apex mammilated, sinistral, outer lip produced, incurved, emarginate at each side, inner lip inconspicuous but reflected. Blackman's Bay. W. F. Petterd.

DUNKERIA FASCIATI. *Mihi.* (*vide* Proc. Roy. Soc. Tas., 1875) should be, I think, *Alvania fasciata*, in which section are deposited turretted *Rissoidæ* with tumid whorls. Even then I think the genus needs revision. In the species in question I should amend the diagnosis by saying that "bicarinate" hardly applies to more than the upper whorls, and otherwise the species is regularly and equally clathrated.

No. 58. RISSOA (ALVANIA?) CHEILOSTOMA. *n.s. R.t. turrita, parva, elongata undique regulariter clathrata, lutea, solida, vix nitente; apice pallidiore, sed non aliter conspicuo; anfra. 7, convexis, regulariter crescentibus; sutura profunde impressa et tenuiter uno-lirata; apertura producta, ovali, integra, conspicué bilabiato; basi convexa, lirata.* Long. 3, lat. 1 mil.

A minute turretted yellow shell, conspicuously latticed throughout, with a produced aperture which is bilabiate and entire. Dredged by Rev. H. D. Atkinson at Long Bay in 20 fathoms shell sand. The entire bilabiate mouth and turretted habit easily distinguish it from *Rissoa* (*Alvania*) *fasciata*.

No. 59. RISSOA AGNEWI. *R.t. turbinato-turrita, solidiuscula, subdiaphana, nitente, varie lutea ac fulva nebulosa, apice turbinato, lævi; anfr. 6, (nucleo incluso), conspicue 4-carinatis; carinis validis, elevatis, angustis, lævibus, nitentibus; interstitiis longitud. tenuissime striatis; apertura integra, ovata; labro producto; labio inconspicuo.* Long. 3, lat. 1, mil. Blackman's Bay, W. Legrand, and W. F. Petterd.

Shell turbinately turretted, rather solid,translucent, shining, irregularly clouded yellow and brown; apex turbinate, smooth, whorls 6, nucleus included, conspicuously four keeled; keels valid, raised, narrow, smooth, shining; interstices very finely striate lengthways, aperture entire, ovate, outer lip produced, inner lip inconspicuous. Obs. Distinguished by its four keels.

No. 60. RISSOA CYCLOSTOMA. *n.s. R.t. cylindraceo-elongata, pupæforme, subturrita, medio tumida, lævi, opaca, olivacea; apice obtuso, livido; anfr. 6, convexis, longitud. tenuiter striatis, ultim. anfr. producto; sutura linea alba marginata; apertura alba, integra, producta, eversa; labio reflexo, adhærente, basi convexa.* Long. 4, lat. 1½ mil.

VAR ROSEA. *R.c. ut supra sed rosea tincta.*

Shell cylindrically elongate, pupæform, sub-turretted, tumid in the middle, smooth, opaque, olive, apex obtuse, livid; whorls 6, convex, finely striate lengthwise, last whorl produced; suture margined with a white line, aperture white, entire, produced, everted; lip reflected and adhering, base convex. Long Bay, Rev. H. D. Atkinson; Blackman's Bay, W. F. Petterd.

There is a rose coloured variety of this shell.

No. 61. RISSOA (SETIA) SIENNÆ. *n.s. R.t. turbinato-conica, subumbilicata, opaca, sordida, corrosa, vel epidermide induta, fumoso cornea; anfr. 5, convexis, striatis (?) apertura integra, semilunari, labro acuto, labio reflexo.* Long. 4, lat. 3.

Shell turbinately conical, subumbilicate, opaque, sordid, corroded or clothed with an epidermis, smoky horn color; whorls 5, convex, striate (?), aperture entire, semilunar, outer lip acute, inner lip reflected. North Coast, W. F. Petterd.

No. 62. RISSOA MELANURA. *n.s. R.t. turbinata, conoidea, solida, atra sed translucente vel ætate intus alba, lævi, nitente; anfr. 5, vix convexis, sutura impressa; apertura antice producta, rotundata, simplici, basi convexa, obtuse angulata.* Long. 2, lat. 1 mil.

Shell turbinate, conoid, solid, blackish but translucent, or white within when old, smooth, shining; whorls 5, scarcely convex, suture impressed, aperture anteriorly produced, rounded, simple, base convex, obtusely angulate. Blackman's Bay, W. F. Petterd.

No. 63. RISSOA (CINGULA) ATKINSONI. *n.s. R.t. minuta, turbinato-conoidea, polita, translucida, pallide cornea, obscure fusco bifasciata, columella nigra, apice minutissima, turbinata, subverticaliter sito, (sæpius decollato); anfr. 5, (apice excluso) rotundatis; sutura sat impressa; apertura quam spira breviore, ovata, antice producta; labro tenui, acuto; labio reflexo, umbilico simulante.* Long. vix. 1, lat. ½ ?

Shell minute, turbinately conical, polished, translucent, pale horn color, obscurely bifascate with dusky brown, and with a black columella, apex most minute, turbinate and subvertical (more often decollate), whorls 5, exclusive of the apex, rounded; suture well impressed, aperture shorter than the spire, ovate, produced anteriorly, outer lip thin, acute, inner lip reflected into a false umbilicus. Long Bay, Rev. H. D. Atkinson.

No. 64. RISSOA ANGELI. *n.s. R.t. minuta, umbilicata, turbinato-conoidea, tenui, lutea, pellucida, undique spiraliter tenuiter et regulariter lirata, et obsolete regulariter oblique distante costata; costis angustis, ad peripheriam ult. anfr. desinentibus; liris supra costas transeuntibus; anfr. 5, convexis, superne coronatis; sutura sat impressa; apertura rotundata, labro crassiusculo; labio erecto, antice incrassato, retro ad umbilic. canaliculato.* Long. 1½, lat. ⅝ mil.

Shell minute, umbilicate, turbinately conical, thin, yellow, pellucid, regularly spirally lirate all over, and obsoletely, regularly, obliquely, and distantly ribbed; ribs narrow, ceasing at the periphery of the last whorl; liræ passing over the ribs; whorls 5, convex, coronate above, suture well impressed, aperture rounded, outer lip thickened, inner lip erect, anteriorly thickened, canaliculate behind to the umbilicus. Long Bay, Rev. H. D. Atkinson; Blackman's Bay, W. Petterd. Obs. The peculiar pointed, narrow, rounded, ribs, are, as it were, hidden under the liræ. The generic position of the shell appears to me very doubtful. Dredged at 10 fathoms sand.

No. 65. Rissoa (Ceratia) maccoyi. *n.s. R.t. minuta, elongata, turrita, alba, subpellucida, undique tenuiter spiraliter lirata et obsolete longitud. striata; sutura constricta; anfr. 6, declivis, superne subcanaliculatis, convexis; apice? (decoll.) apertura integra, ¼ long. spiræ, ovata, tenui, acuta, antice eversa; labio sub-reflexo, umbilico simulante.* Long. 3, lat. 1½ mil.

Shell minute, elongate, turretted, white sub-pellucid, slenderly, spirally lirate and obsoletely striate, lengthwise all over the surface; suture constricted; whorls 6; sloping, subcanaliculate above, convex; apex? (decollate), aperture entire, ¼ length of spire, ovate, thin, acute, anteriorly everted; lip subreflected into a false umbilicus. Long Bay, Rev. H. D. Atkinson; Blackman's Bay, W. F. Petterd.

No. 66. Rissoina flindersii. *n.s. R.t. fusiforme-turrita, minuta, solida, pallidissime carnea vel alba, apice pallidiore, lævi et 1½ anfr. rotundato; anfr. 7, convexis, in medio tuberculato-costatis costis 8-12, et superne costulis 26-28 coronatis; apertura integra, rotundata; labro antice producto; labio conspicue quasi umbilicato reflexo, basi convexa, long. striata.* Long. 3, lat. 1½ mil.

A small fusiformly turretted species, mainly distinguished by the margin of small ribs which crown the whorls. Sometimes a prolongation of the larger almost tuberculous ribs enters into the series of the smaller ones, but on many specimens they are entirely distinct. North West Coast, W. F. Petterd. Not very common.

No. 67. Rissoina st. claræ. *R.t. pyramidate turrita, latiuscula, nitente, tenui, pallide carnea, lineis tenuibus, et maculis rufis zonata; anfr.* 11, 2 *ult. lævibus, convexis, reliquis, medio angulatis et convexis, tuberculato costatis; costis* 9-10, *nitentibus, basim versus prominentioribus, sutura bene impressa; apice* ¾ *anfr. spiraliter striato; apertura integra, elongato-ovata; basi declivo-convexa, labro acuto, producto; labio inconspicuo, reflexo.* Long. 9, lat. 3½ mil.

Shell pyramidal, turretted, rather broad, shining, thin, pale flesh color, zoned with slender lines, and red spots, whorls 11, 2 last smooth and convex, the rest angular in the middle and tuberculately ribbed, ribs 9-10, shining, rather more prominent towards thebase of the whorls, suture well impressed, apex of 3-4 whorls spirally striate, aperture entire, elongately ovate, base sloping and convex, outer lip acute, produced, inner lip inconspicuous, reflexed. North West Coast, W. F. Petterd.

No. 68. Rissoina concatenata. *n.s. R.t. minuta, elongata, turrita, opaca, alba, quasi erosa ; anfr. 9, convexis, declivis, undique irregular, concatenatis quasi variolatis ; apice nucleoso, lævi, nitente (2 anfr.) ; apertura ovata, labro tenui, labio reflexo, subdisjuncto.* Long. 2½, lat. ⅝ mil.

Peculiarly pitted on the surface like the top of a thimble, which gives the shell a roughened worn appearance. North West Coast, W. F. Petterd. I think also that it occurs as a fossil at Table Cape.

No. 69. Diala tessellata. *Nobis.* See *Proc. Roy. Soc Tas.*, 1875. Among the species dredged by the Rev. H. D Atkinson there occur some shells resembling the above species, except that they are covered with a dark horny epidermis, and the inner lip not reflected, or, at least, scarcely perceptibly so. All my typical specimens were old and somewhat worn. It is a question with me whether all ought not to be referred to Angas' *Alaba* (?) *phasianella.*

No. 70. Tornatina mariæ. *n.s. T.t. parva, ovata, tenui, alba, lævi polita, spira parum exserta ; anfr. 5 ; nucleo verticaliter sito, sutura profunde canaliculata apertura angusta, medio vix coarctata ; labro acuto ; labio antice incrassato et contorto.* Long. 5, lat. 2. Spira vix 1½ mil.

Shell small, ovate, thin, white, smooth polished spire, slightly exsert, whorls 5, nucleus placed vertically, suture deeply canaliculate, aperture narrow, scarcely constricted in the middle, labrum acute; lip thickened and twisted anteriorly. North West Coast, W. F. Petterd.

No. 71. Ampullarina minuta. *n.s. A.t. minuta, globosa, alba, solida, nitente, lævi ; anfr. 4, rapide crescentibus, rotundatis et tenuissime striatis ; spira parum exserta ; sutura impressa ; apertura integra, late ovata, intus aurantia, tenui, simplici, umbilico angusto.* Diam. 3.

A minute species of ampullarina, the generic position being however doubtful. It differs from the Tasmanian species (probably only one, though two are described) in its size, absence of color (except in the throat which is orange), smoothness, and the spire being less exsert, the shell more approaching *Natica* in form. Circular Head, W. F. Petterd.

No. 72. Acmæa petterdi. *n.s. A.t. late ovata, tumida, depressa, apice acuto et submarginali ; nitente, sordide albida, confertissime undulose concentrice striata lineis incrementi, et irregulariter late sulcis rudis, fulvis, interruptis indistincte radiata ; margine acuta, intus eleganter castanea et fulva fimbriata ; pagina albida, pallide castanea nebulosa ; spatula fulva, exacte definita.* Diam. maj. 22, min. 20, alt. 7.

This *Acmæa* somewhat resembles an old and enlarged *Acmæa septiformis*, but its size is larger than that species is ever known to attain. It is dull white and shining, with the lines of growth very distinctly marked. North West Coast, W. F. Petterd. Rare.

No. 73. Acmæa alba. *n.s. A.t. late ovata, depressa, scabra, tenui, alba, subnitente ; apice submediano, acuto : costis inæqualibus, acutis, parvis numerosis, imbricato-granosis, aliquando in fasciculis congregatis, radiata ;*

interstitiis tenuiter, confertissime, undulose striatis ; intus nitente albida sæpe pallide fulvo nebulosa vel radiata ; spatula nulla ; margine acuta, leviter undulata, linea pallide fulva eleganter fimbriata. Diam. maj. 26, min. 22, alt. 7, mil.

A white silky species; porcelainous inside and delicately margined with light brown, not unlike the Chinese umbrella shell, but smaller. The fine scabrous ribs are gathered sometimes into a bundle, which thus forms a compound rib. It is very different from any other southern form, and rare. North Coast, W. F. Petterd.

No. 74. Tugalia Tasmanica. *n.s. T.t. magna, crassa, ovata, postice attenuata, antice planato, alta, tumide rotundata, convexa, sordide alba, apice rotundato (eroso) submediano ; radiatim eleganter crebre costata costis parvis numerosis, alternantibus et irregul. rugose crenulato clathrata, lineis incrementi concentricis ; marginibus crassis, sinuato arcuatis, crebre tuberculis crenulatis ; pagina interna alba, castanea, pallide nebulosa, polita ; sinu lato, inconspicuo.* Long. 37, lat. 25, alt. 15.

A very thick large solid *Tugalia* with many alternating ribs, and rugose irregular sinuous lines of growth. The inside is white, polished and clouded with chestnut. Only one specimen collected. North West Coast, W. F. Petterd. There is a shell very like this in the Nat. Mus., Melbourne, and named *Tugalia elegans*, Gould. It is stated to come from Victoria. I have not been able to trace the reference.

Macroschisma tasmanica. *Mihi. Var. rosea radiata.* I have met with a variety of the above shell ornamented with numerous rose colored rays. Sowerby has described a shell under the name of *M. tasmanica*, which I believe to be no more than a variety. If, however, my name must give way I propose to change it to *M. weldii*. Circular Head, W. F. Petterd.

No. 75. Nucula minuta. *N.t. minuta, ovata, postice attenuata, antice subtruncata, nitente, tenui, translucida, argentea, creberrime costulis minutissimis regularibus radiata et lineis incrementi sulcata ; marginibus rotundatis subtillissime crenulatis ; dentibus card.* 12, *natibus obliquiis acutis.* Long. 1½, lat. 2, mil.

Shell minute, ovate, posteriorly attenuate, anteriorly subtruncate, shining, thin, translucent silvery, radiate closely with minute regular riblets and sulcate with the lines of growth, margins rounded, very finely crenulate, cardinal teeth 12, umbones oblique, acute. Blackman's Bay. Common. W. F. Petterd.

No. 76. Limopsis cancellata. *n.s. L.t. parva, orbiculari, vix obliqua, crassa, tumide convexa, radiatim costata ; costis numerosis* (36 ?) *rotundatis subgranosis, parvioribus, interdum intercalantibus* ; *tenuiter, regulariter, crebre concentrice lirata ; natibus parvis, rotundatis, cancellatis ; pagina interna nivea, polita ; fossula ligam. trigona, minuta ; dentibus* 22-24, *marginibus incrassatis, planatis, politis, interior, haud nitente, radiatim striata.* Long. 12½, lat. 13.

Shell small, orbicular, scarcely oblique, thick, tumidly, convex, radiately ribbed with about 36 rounded subgranular ribs, with smaller ones sometimes between; finely, regularly, and closely concentrically lirate; umbones small, rounded, cancellate; inside snowy white and polished; ligamental fossa trigonal, minute; teeth 22-24; margins thickened, flattened, polished, within which the shell is not shining, but is radiately striate. North Coast, W. F. Petterd. There is much reason to doubt if this rare shell, of which few specimens are ever found out of very deep water, is not identical with the common fossil of Australian tertiaries *L. decussata.*

No. 77. MYTILUS LATUS LAM. *nov. var ? M.t. late rotundata et postice obtuse angulata, valde compressa, tenui, polita, tenuiter regulariter sulcata, et irregulariter lineis incrementi, et tenuissime radiatim striata, epidermide intense olivacea, duobus lineis latis luteis ab umbonibus marginem versus ornata, ad ligamentum eleganter rufo-fulvo nebulosa, umbonibus parvis, acutis, incurvis, lævis, albis, marginibus acutissimis.*

There are many species of *Mytilus* recorded as Tasmanian, and this does not agree with the description of any of them. Its peculiar characters are its very compressed falcate habit, and its brilliantly shining olive epidermis, with the yellowish brown broad arched line proceeding from the umbones along the margins. In Dr. Cox's collection the shell marked *M. dunkeri* has an olive epidermis, but it is a tumid solid shell. Reeve's figures of *M. dunkeri* are evidently from worn specimens. *M. dunkeri* is an American shell wrongly called Australian by Reeve, *M. rostratus* is a different species. I do not regard it as more than a variety, nor are the variations between the species greater than those to which *M. edulis* of the European seas is subject, and which has received a dozen names. That shell has also an olive epidermis, but is a much more dull and tumid shell.

No. 78. MYTILUS CRASSUS. *n.s. M.t. nitente, subquadrata, medio angustata, subgibbosa, postice rotundata et subattenuata, valde tumida, et oblique conspicué unicostata, costis in umbonibus subspiraliter desinentibus; epidermide intense badia; paucis cappilis longis, corneis, in discis albis, convexis, rotundatis, radicatis armata; lineis increment. irregularibus elevatis, conspicuis; marginibus epidermide fulva, nitente, indutis; umbonibus margarataceis, glabratis; fossula producta, umbonibus parum excedenti; pagina interna carneo-alba, impressione pallii et musculari purpurascente, conspicua: ligamento longo conspicuo.* Long. 21, lat. 11, diam. 2 valvis conj. 13.

This dwarfed *Mytilus* is easily distinguished by its tumid subgibbose form, and the inordinate thickness of the shell when the valves are conjoined. It has a rugose, shining lacquer-like epidermis of intense brown color, on which are a few wart-like discs supporting long stout bristle-like hairs. It has also a conspicuous rounded ridge or rib on each valve, which curves almost to a spiral at the umbo.

Rare at Circular Head, and abundant at Adventure Bay, W. F. Petterd.

Modiola albicostata. *Var.* 1, *polita. Var.* 2, *nebulosa.* Two varieties of this most variable shell have been forwarded to me, one from Diana Basin, near George's Bay (Aug. Simson), a small deep black or olive tumid shell, very highly polished and seldom divested of the epidermis. Hinge margin very acute, straight and angular. Long. 11, lat. 24, which size it preserves very constantly, and is found in great numbers. 2, *var. nebulosa.* A larger, more tumid, less polished shell, paler or clouded chestnut and deep brown, often distorted; hinge margin less acute and less angular, ventral margin sinuous. Long. 13, lat. 30. Isthmus Bay, Rev. H. D. Atkinson. Abundant at low water attached to weed.

No. 79. Diplodonta tasmanica. *n.s. D.t. orbiculari, subglobosa, tenui, alba, subpellucida, epidermide fusca plus minusve induta; concentrice striata, striis incrementi tantum sed* 2-3 *latioribus insignita, natibus lævibus, acutis, ligamento conspicuo, margine dorsali acuto.* Long. 17, lat. 18.

Shell orbicular, subglobose, thin, white subpellucid, more or less covered with a fuscous epidermis; concentrically striate with lines of growth only, but distinguished by 2-3 much broader lines; umbones smooth, acute; ligament conspicuous, dorsal margin acute. Storm Bay, and Blackman's Bay, not uncommon. W. F. Petterd, W. Legrand, Rev. H. D. Atkinson.

No. 80. Semele warburtoni. *n.s. S.t. orbiculari, sub-inflata, crassiuscula, radiatim tenuiter costata, costis numerosis, depressis, irregularibus, antice latioribus; concentrice creberrime lamellata, lamellis, minutis, regularibus, crassiusculis, retrorsim curvatis; lineis incrementi* 3-4, *conspicuis; natibus parum exsertis; alba, margine dorsale, eleganter rosea tincta; intus polita nivea.* Long. 30, lat. 34, alt. 12.

Shell orbicular, sub-inflated, rather thick, radiately finely ribbed, ribs numerous, depressed, irregular, broader anteriorly; concentrically thickly lamellated, lamellæ minute, regular, somewhat thick, curved backwards; lines of growth 3-4, conspicuous; umbones slightly exsert, shell white, dorsal margin elegantly rose tinted, polished and snowy white inside. West Coast. W. F. Petterd.

No. 81. Gouldia tasmanica. *n.s. G.t. parva, transversa, acute trigona, alba, compressa, concentrice lirata, liris elevatis, rotundatis, aliquando in medio attenuatis et desinentibus; interstitiis tenuissime reticulatis, umbonibus acutis, marginibus rotundatis.* Long. 2½, lat. 3.

Shell very small, transverse, acutely trigonal, white, compressed, concentrically ridged, ridges raised, rounded, sometimes becoming attenuate and ceasing in the middle, interstices very finely reticulate; umbones acute, margins rounded. Long Bay, Rev. H. D. Atkinson.

No. 82. Kellia atkinsoni. *n.s. K.t. parva, long. oblonga, oblique trigona, tumida, nitente, translucida, pallide carnea, lævi, obsolete late sulcata; marginibus, rotundatis crenulatis.* Long. 3, lat. 2.

Shell very small, longitudinally oblong, obliquely trigonal, tumid, shining, translucent, pale flesh-coloured, smooth, but obsoletely widely sulcate, margins rounded, crenulate. Long Bay, Rev. H. D. Atkinson. This shell is doubtfully referred to the genus *Kellia.*

CHIONE STUTCHBURYI. *Gray. Dieff. N..Z, p.* 250. A specimen of this shell (*Venus zeylandica,* Quoy Voy. Astrol. 3, p. 522) was given to me by Mr. Gunn as having been found by him in Bass' Straits. It is a native of Chatham Island, and previously unknown in Australia.

No. 83. GASTEROCHÆNA TASMANICA. *n.s. G.t. in cavitate corallium inventa (vagina?) elongata quasi lanceolata, tenui, fragili, inflata, alba, opaca, per totam longitudinem marginis hiantissima, antice breviore, margine fere recto; postice latiore, rotundato; concentrice rugoso striata, striis distantibus, irregularibus; valvis quasi in medio oblique unicostatis et sulcatis, costis latis et in umbonibus, desinentibus.* Long. 12, lat. 5, mil.

Shell found in the cavities of corals and the sheath unknown, elongate almost lanceolate, thin, fragile inflated white, opaque, gaping very widely for the whole length of the margin; shorter anteriorly, margin almost straight, wider and exactly rounded posteriorly; concentrically rugosely striate, striæ distant and irregular; valves somewhat unicostate obliquely in the middle with a groove by the side, ridge wide and ceasing in the umbones, which are inconspicuous. South Coast. Rare. W. Legrand; W. F. Petterd. Long Bay Rev. H. D. Atkinson.

ON A NEW REVERSED TASMANIAN HELIX.

HELIX WELDII.

By the Rev. J. E. Tenison-Woods, F.G.S., Cor. Mem. Roy. Soc. Sydney and Tasmania, and of Lin. Soc., N.S. Wales.

[*Read October 9th, 1876.*]

A very few years ago the island of Tasmania was regarded as being poor in land shells, but thanks to the zeal and activity of many naturalists, especially Messrs. Legrand, Atkinson and Petterd, the number of species brought to light is now very large. If the island cannot take a leading position for the number and peculiarity of its forms it has by no means an insignificant one. Up to a recent period the description of the species were scattered over an immense number of scientific works according as they had been described by various observers in different countries. Within the last few years Mr. W. Legrand has published a monograph of all the then known land shells, accompanied with extensive notes on the habits, and very excellent figures of the newer species. What gave the work a greater value was that it was for the most part privately printed by the author, the whole of the work being done by his own hand. This work leaves but little to be desired, though new species are of frequent occurrence. It is remarkable that our land shells are entirely distinct from the Australian fauna, except in a few doubtful cases, and some of the forms are beautiful and peculiar in a way that is so marked as to enable us to call it "Tasmanian." I have now to bring under the notice of the Society a new species of Helix which has the additional singularity of being a *reversed* shell. Helices with a sinistral whorl are uncommon. Out of the vast number hitherto made known, including every variety of form in the genus, I believe I am right in stating that very few more than a dozen are reversed, and this sinistration, if I may be allowed to coin a word, is not confined to any particular section of the genus so as to elevate it to generic importance. It is remarkable, however, that hitherto as far as I am aware it has been only found in Helices of China, the Indian Archipelago, and in the Indian Peninsula. It is, I may say, a tropical peculiarity, but, at least, no such form has as yet been hitherto found in the Southern Hemisphere. The present species is very small, confined, as far as we know, to one restricted locality on the north-west side of the island. It was found by Mr. W. F. Petterd. I have done myself and the Society the honour of dedicating it to Her Majesty's representative in the colony, His Excellency the Governor, F. A. Weld, Esq., C.M G. The following is the diagnosis :—

Helix Weldii. *n.s.* *H.t.* *Minuta sinistrorsa, anguste umbilicata, turbinato-discoidea, tenuiuscula, nitente, striis confertis,* *sublente tantum bene conspicuis longitudinaliter impressa; pallide corneo-lutea, unicolor, translucent; spira leviter conica, apice prominulo, obtuso; sutura valide impressa; anfr. $6\frac{1}{2}$, convexi, sensim accrescentes, embryonales $1\frac{1}{2}$, albidi, ultimus rotundatus, basi subplanatus; apertura rotundato-lunaris basali, concolor; peristoma simplex, acutum, corneum, marginibus ab umbilico usque ad $\frac{1}{2}$ ultimi anfractus disjunctis; columella brevi. Diam. maj. et min $1\frac{1}{2}$; alt. $1\frac{1}{4}$ mil. Habitat in vicinio civitatis Stanley dictæ, Tasmaniæ. Obs. Sp. valde minuta et sinistrosa, forma vero et colore speciebus multis Tasmaniæ incolantibus sat proxima.*

Shell minute, sinistral, narrowly umbilicate, turbinately discoid, rather thin, shining, with close small longitudinal striæ, which are only visible under the lens; pale yellowish horn and of uniform color, translucent; spire slightly conical, apex a little prominent, obtuse; suture validly impressed; whorls $6\frac{1}{2}$, convex, gradually increasing, embryonal whorls $1\frac{1}{2}$, whitish; last whorl rounded and somewhat flattened, of uniform color; peristome simple, acute, horny; aperture roundly lunate, margins of the peristome separated from the umbilicus to half the height of the last whorl, columella short.

Mr. Petterd notes with reference to this shell. "This small and reversed Helix I have only observed at the foot of the high rocks about Stanley, Circular Head, where I collected it with a few other species of Helices on the surface of blocks of rocks that are overgrown with a thick mass of entangled vegetation. It is extremely abundant and generally in clusters. I have collected some hundreds of specimens. The reversed form is very constant."

ON THE EFFECTS OF WOUNDS ON THE HUMAN SUBJECT INFLICTED BY THE SPURS OF THE PLATYPUS—*(Ornithorhynchus anatinus)*.

BY THE REV. W. W. SPICER, M.A., F.R.M.S.

[*Read* 13*th November*, 1876].

I wish to lay before the Royal Society, an account of an accident which recently occurred to a friend of mine while handling a Platypus, as there are circumstances connected with it, which are rather singular in their nature, and I think worthy of your attention. The friend I allude to is Mr. Augustus Simson, a member of this Society, who is now residing in Gould's Country.

About three weeks ago, he and Mr. Stephens, the School Inspector, were walking by the side of a lagoon, when their attention was attracted by a Platypus, which had swum across from the other side, and was on the point of making its way under the bank. Mr. Simson, an active, energetic man, at once rushed down the bank, and secured the animal. Now, I fancy, this fact alone is worthy of record; for of all the shy wary animals in existence, Platypus is among the shiest and most wary. Under ordinary circumstances, it is no easy matter to catch even a passing sight of one; but here the creature was caught in open daylight, without any preparation, as easily in fact as a rat or a mouse might be in a like case. It made no great struggling; was deposited in a sack, and was carried to the hotel at George's Bay. Here, by some mishap, he escaped, and it was in the effort to re-capture the animal that Mr. Simson met with his accident. I will here quote Mr. Stephens' words, who was present:—

"After an exciting chase, Platypus was re-captured; but this time he revenged himself by giving my friend a severe wound on the hand, one spur slightly tearing the palm, and the other the back of the hand, making a deep puncture between the knuckles of (I think) the first and second fingers. The pain from this was intense, and almost paralysing. But for the administration of small doses of brandy, he would have fainted on the spot. As it was, it was half-an-hour before he could stand without support. By that time the arm was swollen to the shoulder, and quite useless, and the pain in the hand very severe. No ammonia was to be had; no medical assistance was available; and the only treatment that could be adopted, was to keep the whole arm for a night and day in wet bandages, which seemed to alleviate the pain a little, and to reduce the inflammation.

"A week later, I was informed by letter, that the swelling had subsided, the hand being still very tender, with a sensation as of a severe bruise. From this time there was a slow but gradual improvement."

As regards the improvement, I have a letter from Mr. Simson, a portion of which I will read:—

"You have heard through Stephens of my Platypus adventure, no doubt; it is a pity he got away after the mischief he did. * * * I did not know before that they were capable of hurting one. Coombes says, that according to Krefft, their spurs are tubes, and that there is a poison-bag at their base; others also tell me they are hollow. Can you hunt it up and see if it is true? There must be some kind of poison in them, I fancy, as, though the wounds healed up quickly, I still have a queer feeling in the hand and fore-arm, and cannot bear any pressure on the hand; the flesh, especially in the morning when I wash, feels as if it were with the skin grazed off, quite sore, and the hand is still rather cramped, and incapable of grasping anything, though I can use the fingers now again. The foregoing sensations extended right up the arm at first, which was everywhere tender to the touch, and all the joints and bones of the fingers also. Some natives tell me they would rather lay hold of a snake than a Platypus."

I may mention, that on Mr. Stephens attempting to seize the animal, it attacked him in a similar manner; fortunately his hand was protected by a glove, and the spurs only left a deep indentation, without piercing the covering. He says:— "The mode of attack is not by scratching, but (as I know from experience) by a powerful lateral and inward movement of the hind legs, the spurs being thus brought together like the points of a pair of callipers.

It is worth noticing, that the animal was in a state of considerable irritation when re-captured; and also that the object of his attack was a strong man, in the prime of life, and in perfect health."

Now, in regard to the wound received by Mr. Simson, to what are we to attribute the painful consequences which ensued? Are they due to the action of poison, or to the laceration of the nerves, or to some other cause?

Having no practical acquaintance myself with Platypi and their habits, I have looked up whatever works were within my reach bearing on the subject; and the results I will lay before you.

There is no doubt, that the spur is not a solid, but a hollow body, or rather it is a sharp-pointed cone of considerable substance, traversed by a very fine tube, which communicates by a canal with a comparatively large spongy gland situated, not immediately behind it, but some distance up the thigh.

This is plain from the dissections made by Professor Owen.

Mr. Roblin, the Curator of our Museum, informs me that he has himself expressed a yellowish fluid from this gland through the opening in the spur. Seeing that this is so, and coupling with it the severity of the symptoms following on a wound, one is apt to jump to the conclusion that the gland is a veritable poison bag. Judging from analogy, we might say that the case is in every respect similar to that of the serpent tribe, only that with *Ornithorhynchus*, the mechanism for elaborating and injecting the poison, is situated in the heel instead of in the head.

Nevertheless, the opinion of those best able to form a correct judgment appears to be decidedly opposed to this view of the matter.

First, both in date and value, are the observations of the veteran naturalist, Dr. Bennett. *(See "Gatherings of a Naturalist," p.* 107, *&c.)*

Of two German authors, whose books I have, one (Professor Leunis), writes as follows:—"The male has on the hind leg, not far from the foot, a slightly curved movable hollow spur, which opens into a gland, and which may, perhaps, serve some purpose in the animal's connection with the female.

Formerly this gland was supposed to contain poison, which was injected through the spur. But later observations (especially those of M. Verreaux) seem to contradict this theory. Certainly no one has ever seen the the animal attempt to use its spur in self-defence."

Very similar to this are the remarks made by the Zoologists of the French Expedition in the "Astrolabe," as quoted by Owen. They have reference to the male Echidna.

"We have never heard of any accident occasioned by the spur. We ourselves touched and irritated the animal without its once attempting to defend itself by this instrument. No, not even when we made use of considerable pressure." Brehm, the other German author alluded to, contents himself with quoting Bennett. Owen and Waterhouse follow the same leader.

In fact, the question is surrounded with difficulties, and cannot be determined in our present state of knowledge.

If we admit the possibility of the venom theory, then we have in *Ornithorhynchus* a perfectly unique example, that of a mammal, or warm-blooded animal being endowed with poisonous properties. It is true, that in its "sternal" apparatus, this animal comes very near to the Lizard; and knowing, as we do, how closely allied are Saurians and Ophidians, we may, perhaps, see no difficulty in looking upon the Platypus as a distant relation of the latter, and therefore, as having a sort of family claim to their dangerous mode of defence—the poison bag. But in every other respect the Platypus is a true mammal, though of a very low type; and it is very far from probable, that (out of all that huge and important class) the Monotremes alone should be entrusted with so terrible a weapon. Moreover, the faculty is still further restricted; for you must remember that this privilege is entirely confined to the male. In the young female indeed, a small rudimentary spur exists (as we learn from both Owen and Waterhouse); but this disappears as the animal advances in age; and in mature life its absence is marked by a slight depression.

Moreover, if we are to be in any degree guided by analogy, we should look for the poison bag in the weaker rather than in the more powerful sex. At least in the only class in which this means of defence is confined to one of the two sexes (I allude to the insects), it is invariably the female, not the male, which makes its presence felt by its sting. On the other hand I do not give much importance to Dr. Bennett's argument, that he could not *force* the animal to attack him, and that the scratch which he received from the spur, caused him no pain. Nothing is more certain than that the poison of snakes varies in potency at different seasons of the year, and that its virulence depends largely on the circumstances under which it is received.

Baden Powell (in his work called New Homes for the Old Country) observes—"That the Platypus does not attack men with his spurs when caught, may perhaps be attributed to the fact that he is then entirely out of his element. In the water possibly he may be able to make good use of an arm, which, if poisonous, would indeed be most formidable. In cases where scratches have been received from the spur without evil effect, the result may be due to the reservoir of the poison being at the time empty, owing to previous struggles."

Making allowance, however, for all theoretical difficulties, how are we to account for the serious swelling and extraordinary effects suffered by Mr. Simson, except on the supposition of poison having been introduced into his system?

I am well aware that wounds from claws are often very disagreeable and lasting in their effects—even in cases (as of the lion) where there is no suspicion of poison. But in the instance before us, the smallness of the wound—a clean puncture, not an irregular laceration—the intensity of the accompanying symptoms, the celerity with which the parts affected were attacked, seem to point to something more potent than the mere tearing of the flesh.

Still all this is circumstantial evidence, and not of a direct nature.

Nor is it perhaps much more to the purpose to ask: If the spur and its accompanying gland are not intended as weapons, what object are they intended to effect. They may be connected with a sexual object, an opinion which Owen is evidently inclined to adopt. The gland is situated very near the organs of generation, and Bennett suggests that the hollow which takes the place of the spur in the female may not improbably serve for the reception of the spur of the other sex.

It is further conceivable that the fluid in the gland may at this time of the year have some peculiarly acrid or irritant property, and when injected into the human body may produce symptoms similar to those of a true poison.

This is emphatically the season of love among the lower animals. Dr. Bennett notes in his dissections of male Platypi, that during September and October the testes resembled pigeons eggs in size, whereas later in January and February they were not larger than small peas.

May not the season also account for the ease with which the animal was originally captured, knowing as we do how utterly reckless and blind to danger the lower animals often become under this great excitement, and also for the ferocity which it displayed after it was taken, so different to the stupid demeanour which generally characterises it ?

One more suggestion has been made in reference to the use of the spur, which I will give in Baden Powell's words :—" The blunt nature of the spur in older individuals, together with the fact that the Platypus is especially fond of cleaning itself with its hind legs, has led some to suppose that the juice ejected from the spur is of use for the toilet. But then why should the male have so great an advantage over the female in the province of hair dressing ? Why should the husband have the use of pomade, and possibly insect powder combined, while the wife has to content herself with water and vigorous brushing ? " I may add to this that that ornithorhynchian hair oil must be of a singularly acrid and unpleasant nature to produce such effects, when applied inwardly, as we have seen to occur in Mr. Simson's case.

This is all I have been able to bring together anent Platypus and his spur, and little enough it is. I dare say when Australia is more settled, and Ornithorhynchus has been improved off the face of the earth, biologists will have leisure and thought to bestir themselves to enquire into the matter. Just as now we are searching for Dodo's bones, and writing books about them, and doing work which ought to have been done two centuries ago.

I have recommended Mr. Simson if he captures a second male Platypus to perform an operation, which I am afraid will not meet with the approval of the anti-vivisectionists of the old country, viz.: to force it to puncture with its spurs, not himself, but a rat or small bird, and to record the effects. This may do something to unlock what is now a decided and unsolvable mystery.

SYNONYMY OF AND REMARKS UPON TASMANIAN AND OTHER SHELLS, WITH THEIR GEOGRAPHICAL DISTRIBUTION.

By John Brazier, C.M.Z.S., M.L.S., M.R.S. N.S.W.,
Cor. Mem. Roy. Soc., Tas.

[*Read* 13*th November*, 1876.]

1. Helix (Pitys) gunnii.

Helix (Pitys) *assimilis*, Brazier. Proc. Zool. Soc. London, 1871, p. 697.

" " " " In Legrand's second edition of Catalogue Tasmanian Land Shells, August, 1871, sp. 66.

Helix assimilis (Pitys). Pfr. in Monog. Hel. Viv. 1875; vol. VII., p. 166. Hab., near Hobart Town; Mr. Petterd.

I find that Mr. H. Adams described, in the Proc. Zool. Soc., 1866, p. 316, a *Helix assimilis* from Formosa. I have changed my specific name as above in honor of Mr. Ronald Gunn, whose exertions in the cause of science have made us acquainted with many new and rare specimens of natural history from Tasmania.

2. Helix (Pitys) luckmanii.

Helix (*Charopa*) *neglecta*, Brazier. Proc. Zool. Soc. London, 1870, p. 660.

" (*Pitys*) *neglecta*, Brazier in Legrand's Coll. for Mon. Tasmanian Land Shells, sp. 47.

Helix neglecta (Charopa). Pfr. in Monog. Hel. Viv., 1875; Vol. VII., p. 149. Hab., Knocklofty, and Old Mill, Hobart Town; Mr. Petterd. Foot of Mount Nelson; Mr. Legrand.

Helix neglecta pre-occupied by Draparnaud for an European species. Name changed as above in honor of Mr. Luckman, who appears to have done some collecting in Tasmania for the benefit of science.

3. Helix (Pitys) collisi.

Helix minima (*Hyalina*) Cox. Monog. Aust. Land Shells, 1868, p. 10, pl. XII., fig. 8.

Helix (*Hyalina*) *minima*, Cox. In Legrand's Coll. for Mon. Tasmanian Land Shells, 1871, sp. 10.

Helix minima (*Hyalina*). Pr. in Monog. Hel., Viv. 1875; vol. VII., p. 181. Hab., Mount Wellington; Mr. Masters.

Helix minima pre-occupied by H. Adams, Proc. Zool. Soc., 1867, p. 303, species from Island of Mauritius. The Tasmanian species I have named as above.

4. Cypræa umbilicata.

Cypræa umbilicata, Sowerby. Tank. Cat. p. 30, pl. 7.
„ „ „ Thes. Conch., vol. IV., p. 21, Cypræ, pl. VII., fig. 42.
Cyprovula umbilicata, Gray. Proc. Zool. Soc. London, 1849, p. 125.
„ „ Angas. Proc. Zool. Soc. London, 1867, p. 205.
„ „ Brazier. Proc. Zool. Soc. London, 1872, p. 85.

Hab., 25 miles off the coast of New South Wales, between Montague Island and Twofold Bay, brought up from the great depth of 1,900 fathoms, one specimen was obtained by Professor (now Sir) C. Wyville Thomson, in the voyage of H.M.S. Challenger, from Melbourne to Sydney. The specimen was smaller and paler in colour, than any I have ever seen from Tasmania.

5. Scapha mamilla.

Voluta mamilla, Gray, Sowerby. Thes. Conch., vol. I., plate L., fig. 57, 58.
„ „ Reeve. Conch., Incon., pl. XIX., sp. 44.
Scapha mamilla, Gray. Proc. Zool. Soc., London, 1855, p. 55.
Cymbium mamilla, Chenu., Manuel de Conch., 1859, tome. 1, p. 186, fig. 942.
Mamillana mamilla, Crosse. Journal de Conch, 1871, vol. XIX., p. 308.
Scapha mamilla, Brazier. Proc. Zool. Soc. London, 1872, p. 23.

Hab., Lake Macquarie, New South Wales, found on the beaches after easterly gales ; Brazier.

I have seen it recorded as being found at Black River Beach, the Duck River, Port Sorell, and other localities included between Circular Head and the Tamar in Tasmania.

6. Volutella papillosa.

Voluta papillosa, Swainson, in Appendix to Bligh's Catalogue.
„ „ Sowerby, Thes. Conch., vol. I., p. 207, pl. XLVII., fig. 30.
„ *papillaris*, Reeve. Conch., Icon., pl. IV., sp. 10.
Scaphella papillaris, Swainson, Malacology, part I., page 108, fig. 12a.
„ *papillosa* „ „ part II., page 308.
Volutella „ Gray. Proc. Zool. Soc. 1855, pl. 63.
Voluta (*Alcithoe*) *papillosa*, Crosse. Journal de Conch., 1871, vol. XIX., p. 297.

Hab., 25 miles off the coast of New South Wales between Montague Island and Twofold Bay, brought up in the dredge with *Cypræa umbilicata*, from 1,900 fathoms. Encounter Bay, South Australia; Mr. G. F. Angas. Black River Beach to the Duck River, and sometimes in the vicinity of the Tamar Heads, North Tasmania.

7. VOLUTELLA FUSIFORMIS.

Voluta fusiformis, Swainson, in Appendix to Bligh's Catalogue.
„ „ Sowerby. Thes. Conch., vol. I. p. 208, pl. LIV., fig. 100.
„ „ Reeve. Conch. Icon., pl. III., sp. 6.
Scaphella fusiformis, Swainson. Malacology, part I., p. 108, 318.
Scapha fusiformis, Gray. Proc. Zool. Soc., 1855, p. 58.
„ „ Angas. „ „ „ 1864.
Voluta (*Alcithoe*) *fusiformis*, Crosse. Journal de Conch., 1871, vol. XIX., p. 296.

Hab., Broken Bay, New South Wales, found on the beaches after gales. The specimens found are larger and otherwise distinct from the specimens from the Black River Beach, Tasmania.

8. SCAPHELLA ANGASI.

Voluta Angasi, Sowerby. Thes. Conch., vol. III., p. 271., and vol. I., pl. XLVIII., fig. 29.
„ (*Amoria*) *Angasi*, Angas. Proc. Zool. Soc., 1867, p. 193.
„ „ „ Crosse, Journal de Conch., 1871, vol. XIX., p. 289.

Hab, 3½ miles east of Port Jackson Heads in 45 fathoms hard sand bottom. Middle Harbour, Port Jackson, Lake Macquarie at Moon Islet, Port Stephens on the North of Sydney; Brazier. Corner Inlet, Victoria; Mr. R. C. Rossiter. The home of this species appears to be from Circular Head to the mouth of the River Tamar.

I consider all these so-called species to be only local varieties of *Voluta undulata*, Lam; = var. *Angasi*, Sowb.; = var. *Australiæ*, Cox; = var. *Kingi.*, Cox; = var. *Sclateri*, Cox.

9. VOLUTA SOPHIA. GRAY.

I found at Warrior Reef on the sands, and at 30 fathoms, Darnley Island, Torres Straits, var. of *Voluta Norrisi*, Sowb., from Nichol Bay; Camden Harbour and Tien Tsin Passage; North West Coast of Australia.

10. VOLUTA TURNERI. GRAY.

North Australia. = Var. *Ellioti*, Sowb.; = var. *Jamracki*, Gray; from North West Coast of Australia.

11. Voluta pulchra. Sowb.

= Var. *Wisemani*, Brazier, from North East Australia.

12. Voluta piperita. Sowb.

Typical, Rubiana, Solomon Islands. = Var. *Ruckeri*, Crosse, from Florida, Savu, Ysabel, Rubiana, Shortland and Bougainville Islands, Solomon's Archipelago. = Var. *Macgillivrayi*, Cox, from Woodlark Island, east side of the fork of New Guinea. Specimens in Australian Museum named *piperita* by Mr. G. F. Angas when Secretary.

13. Voluta reticulata. Reeve.

= Var. *Reevei*, Sowb., from Ashburton River and Tien Tsin Creek, North West Astralia.

14. Voluta rutila. Broderip.

From Darnley Island, Torres Straits. = Var. *innexa*, Reeve, from Louisiade Islands, near the south fork of New Guinea.

15. Voluta flavicans. Gmelin.

From Katow, New Guinea. = Var. *volvacea*, Lam.; = var. *lugubris*, Swainson ; = var. *modesta*, Wood ; = var. *signifer*, Broderip ; = var. *Tissotiana*, Crosse, from Port Essington and Liverpool River, North Australia.

16. Voluta harfordi. Cox.

= *Voluta canaliculata*, McCoy, one and the same species.

A fine living specimen was dredged by Commodore (now Admiral) Loring, at Broad Sound, North East Australia, when in command of H.M.S. Iris, it was found packed up in the collection with other shells from the same place by Mr. Angas in 1872. The locality given by Dr. Cox, when describing it from specimens received from Tasmania, and said to have come from Wreck Reefs, Bird Island, near Lady Elliott Island, is quite a novelty for geographers ; I find Lady Elliott Island is just inside the Great Barrier Reef in a direct line with Roundhill Head, near Harvey's Bay, on the North East Coast of Australia. Wreck Reefs are 300 miles outside the barrier, about E.N.E. of Lady Elliott Island. Professor McCoy, when describing specimens received from the same person from whom Dr. Cox obtained his, gives Port Denison, Queensland, as a habitat for this shell. I doubt very much its being found so far north.

17. Callista victoriæ.

Callista victoriæ, Woods. Proc. Royal Soc. Tas. 1875, p. 27.

Hab., Lake Macquarie and Port Stephens, New South Wales, found in a living state on the sand beaches after heavy weather. The Rev. J. E. Tenison-Woods records it from Cloudy Bay on the south of Bruny Island, Tasmania. I have received dead and worn valves from Cloudy Bay.

METEOROLOGY FOR JANUARY, 1876.

Owing to unavoidable circumstances, the Hobart Town Meteorological Table for January is incomplete, no observations having been recorded until the 22nd. The results of the observations from that date until the end of the month (10 days) are as follows :—

Barometer. —Mean Pressure, 29·921 inches.
Max. „ 30·226 „
Min. „ 29·444 „

Wind.—Mean Force, ·34lb. per sq. foot.
Max. „ 2·601b. „ „
Min. „ 0· „ „
} Prevailing direction, S.E.

Thermometer, Fahrenheit.—Mean Temp. 66·05°, Max. 88·0°, Min. 55·0°.

Relative Humidity, per cent.—Mean ·74, Max. ·94, Min. ·52.

Highest Temp. in Sun.—Mean °104·95, Max. °121·0, Min. °64·0.

Ditto in Shade.—Mean °78·85, Max. 93·0, Min. 60·5.

Terrestrial Radiation.—Mean °51·45, Max. °62·0, Min. °41·5.

Rain in Inches.—Total, ·68.

Spontaneous Evaporation.—Total amount, 3·44.

Cloud.—Mean amount, 6· (scale 0—10).

Ozone.—Mean amount, 4·30 (chromatic scale).

Electricity.—Positive 5, negative 12, nil 3.

Time of Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month of January, 1876 :—

18th.—First ripe Apricot gathered.
20th.—Veronica Angustifolia in full flower.
24th.—Jargonelle Pear ripe.
25th.—Grevillea Robusta in flower.
31st.—Mulberries commencing to ripen.

F. ABBOTT, Jun., Superintendent.

Results of observations taken at New Norfolk for January, 1876 :—

Barometer (corrected and reduced), mean of three daily readings, 29·804in.
Thermometer, mean of three ditto, 64·74°.
Dew-point, mean position of three ditto, 53·40°.
Elastic Force of Vapour, mean of three ditto, ·402.
Humidity, mean of three ditto, ·66.
Solar Intensity, mean of max. temp., 130·61°.
Terrestrial Radiation, mean of min. temp., 45·19°.
Rainfall, 1·66in.
Evaporation, 4·73in. ; in excess of rainfall, 3·07in.
Clouds, mean of three daily registers, 5·62.
Ozone ditto of two ditto, 5·82.
Wind, total of three ditto, 79·27lb. per sq. foot.
Horizontal Movement, 25·27 miles.
49 obs. of electricity, 27 negative, 18 positive, 4 nil.

W. E. SHOOBRIDGE, Valleyfield.

PRIVAT

Latitude 42°

(Regist

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermom Self-Regis Highest in Sun, 4·30 p.m.	Highest in Shade,
1	29·924	30·005	12·0	55·0	61·0	105·0	72
2	30·126	30·125	13·0	51·0	63·0	95·5	69
3	30·174	30·089	12·5	65·0	72·0	95·5	75
4	30·143	29·985	15·0	60·0	75·0	98·0	8
5	30·005	29·812	18·0	60 0	54·0	114·0	8
6	29·901	29·731	18·0	65·0	72·0	100·5	8
7	29·624	29·738	18·0	64·0	69·0	110·0	8
8	29·855	29·857	17·0	63·0	66·0	93·0	7
9	29·915	29·668	14·0	57·0	68·0	98·0	7
10	29·287	29·377	15·0	60·0	56·0	101·0	7
11	29·848	29·945	9·0	49·0	62·0	94·0	7
12	29·937	29·910	11·0	52·0	62·0	82·5	6
13	29·879	29·761	12·0	54·0	74·0	115·0	8
14	27·965	29·811	15·0	60·0	67·0	108·5	7
15	28·045	29·722	15·0	60·0	62·5	97·0	6
16	29·890	29·907	9·0	49·0	63·0	101·0	6
17	29·826	29·844	13·0	57·0	68·5	111·0	7
18	29·7[illegible]3	29·797	13·0	61·0	66·0	94·5	6
19	30·0[illegible]8	30·072	14·0	58·0	62·5	107·0	7
20	30·118	29·997	13·0	57·0	66·0	110·0	7
21	29·924	29·760	12·0	55·0	61·5	108·0	6
22	30·079	30·055	12·0	54·0	62·0	103·5	6
23	29·982	29·852	10·0	50·0	63 0	110·0	7
24	29·5[illegible]0	29·39[illegible]	12·0	54·0	68·0	104·0	7
25	29·3[illegible]3	29·2[illegible]1	10·0	50·0	66·0	109·0	7
26	29·659	29·802	11·5	53·0	64·0	113·5	
27	30·090	30·113	8·0	47·0	58·0	104·0	
28	30·241	30·193	8·0	47·0	63·0	112·0	
29	29·997	29·997	9·0	49·0	66·0	103·0	
	Mean Press. 29·811		Mean 12°.66	M'n. Tem. 60°.92		Mean 103°.88	7
	Greatest do. 30·241		Max. 18°·0	Max. 84°.0		Max. 115°.0	
	Least do. 28·045		Min. 8°	Min. 47°.0		Min. 82°.5	

The Meteorological form brought into u
1876 differs in some respects from the
en adopted with the view of assimilatin
cords more closely with those of s
merica, etc., in order to co-operate in
tional Meteorology. Readings are adc
ade thermometer, that being the instru
the continent of Europe.
The mean is in all cases taken from t
ily registers, not from the maximum an
The direction of the wind is registered
ight of 92 feet above sea level, and i
uare foot.
The relative quantity of rain that fell
inds is registered each morning at 7·30 a
The thirty-five years' standard tables a
e difference from average.

FRANCIS ABBO

me of leafing, flowering, and fruitin
plants in the Royal Society's Gard
1876:—

METEOROLOGY FOR FEBRUARY, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52' 13" S ; Longitude 9h. 49m. 29.-2s. E.

(Registered for the Royal Society of Tasmania.)

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4·30 p.m.	Thermometers Reading. Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers Self Registering. Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent. 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m. Character.	Amount.	Clouds. 4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	29·924	30·005	12 0	55 0	61 0	105 0	72·5	50 0	81	72	KS	9·0	KS	5 0	SE	2 60	S	2·60			6 0
2	30 126	30 125	13 0	51 0	63·0	95 5	69 0	49 0	71	77	K	9·0	K	7·0	NW	0·	SE	·52			4·5
3	30·174	30·080	12·5	65·0	72·0	95·5	75 0	47·5	75	69	K	[illegible]	K	4 0	NW	·26	SE	·26	·01		3 0
4	[illegible]	[illegible]	15 0	60 0	75 0	98 0	88 0	50 0	72	66	KS	7 5	N	10 0	N	·52	S	0·			5·5
5	[illegible]	[illegible]	18 0	60 0	54·0	114 0	88·5	53·5	78	60	O	0	O	·0	N	·26	SE	0·			3·0
6	[illegible]	[illegible]	15 0	[illegible]	72 0	100 5	85·0	58 5	88	74	K	7 0	K	7 0	SE	0·	S	·52			5 5
7	[illegible]	[illegible]	15 0	64 0	69 0	110 0	82 0	55 5	88	83	K	7·0	KS	8 0	E	0·	S	·52			5·5
8	[illegible]	[illegible]	17·0	63 0	66 0	93 0	74·0	56·0	82	73	K	9	N	10 0	E	0·	SE	·52			3·5
9	[illegible]	[illegible]	14 0	57 0	68 0	98 0	70 0	55·0	93	78	N	10·0	K	4 5	S	0·	SE	·26			5 0
10	[illegible]	[illegible]	15 0	60 0	[illegible]	101 0	71 0	[illegible]	94	56	N	7 5	N	[illegible]	N	0	SW	[illegible]	·06		3 5
11	29 848	29 945	9 0	49·0	62·0	94 0	72·5	39 5	73	51	KN	7 0	K	4 0	N	·52	SW	5·21	·25		5 0
12	29 937	29 910	11·0	52 0	62 0	82 5	62 5	43 0	74	77	KN	7·0	KS	10 0	W	·26	SE	0·	·02	2 09	3·5
13	29 879	29·761	12·0	54·0	74·0	115 0	81·0	44·5	81	66	O	·0	K	3 0	NW	0·	S	·26			3·5
14	27·965	29 811	15·0	60 0	67·0	108 5	76·0	51 0	77	68	K	2 0	KS	3·0	N	0·	SE	·52			4 0
15	28 045	29 722	15·0	60·0	62 5	97·0	69 0	51·0	62	59	K	8·5	K	7·0	N	·26	S	2 60	·02		3 0
16	29 890	29 907	9·0	49 0	63·0	101 0	66 0	42 0	74	51	K	6 0	K	4 0	N	·52	SW	·52	·01		4 0
17	29 826	29 844	13 0	57·0	68 5	111·0	75 0	51·0	71	73	K	4 5	KN	10 0	W	2 60	W	·52			4·5
18	[illegible]733	29 797	13·0	61·0	66·0	94·5	60 5	57·5	77	60	KN	10·0	KN	8 5	NW	0·	W	·52			3 0
19	[illegible]	[illegible]	14 0	58 0	62 5	107 0	72 0	50·0	66	63	K	7·5	K	4 0	W	0·	SE	·52			5·0
20	[illegible]	[illegible]	13 0	57·0	66·0	110 0	72 5	49 5	76	73	KS	7·0	KN	8·0	NW	·26	SE	·26		2 78	3 5
21	[illegible]	[illegible]	12·0	55·0	61·5	108 0	68·0	41·0	81	[illegible]	KN	8·0	K	7 0	SW	0·	S	·52	·01		4·0
22	[illegible]	[illegible]	12 0	54 0	62·0	103 5	66·0	45·0	75	67	KS	10 0	KN	9 0	SE	0.	S	2·60			4·5
23	[illegible]	[illegible]	10·0	50·0	63·0	110·0	71·5	43·0	86	72	K	4 0	KS	7·5	W	·26	SE	·52			5·0
24	[illegible]	[illegible]	12 0	54 0	68 0	104·0	72 0	49·5	81	73	KN	10 0	K	8 0	N	0·	SE	·26			5 5
25	[illegible]	[illegible]	10 0	50 0	[illegible]	[illegible]	75 0	42 0	74	[illegible]	K	1 0	N	[illegible]	N	0	W	10 42			4 0
26	[illegible]	[illegible]	11 5	53 0	[illegible]	[illegible]	[illegible]	47 0	[illegible]	55	K	[illegible]	K	[illegible]	SE	[illegible] 21	S	·52			3 0
27	[illegible]	[illegible]113	8 0	47 0	55 0	[illegible]	69 0	43 5	[illegible]	76	O	[illegible]	KN	[illegible]	N	·26	S	2 60	[illegible]		5 0
28	30·241	30·193	8·0	47·0	63 0	112·0	69 0	40·0	79	67	K	3·5	O	·0	N	0·	S	·26			5·0
29	29 997	29 997	9·0	49 0	66·0	103·0	72 0	45·0	86	68	KS	6 0	KN	10 0	N	·52	S	·26		1·24	5·5

Barometer	Centigrade	Fahrenheit	Sun	Shade	Grass	Humidity	Clouds	Wind	Rain	Evap.	Ozone
Mean Press 29 811	Mean 12°.66	M'n Tem. 60°.92	Mean 103°.88	Mean 73°.52	Mean 48°.53	Mean. 73·0	Mean for Month. 6 21	Mean Force. 1 02	Tl 54	Tl. 6 11	Mean 4 33
Greatest do. 30·241	Max. 18°·0	Max. 84°.0	Max. 115°.0	Max 88°.60	Max. 58°.50	Max. 94 0	Prevailing Character. K and KN	Greatest Force. 10·42			
Least do. 28 045	Min 8°	Min 47°.0	Min 82°.5	Min 62°·50	Min 40°.50	Min. 51·0		Least Force. 0			

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc , in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of [illegible] feet above sea level, and its force in lbs per square foot

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a m

The thirty five years' standard tables are used for obtaining the difference from average

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering, and fruiting of a few standard plants in the Royal Society's Garden during February, 1876 :—

10th.—Kerry Pippin Apple commencing to ripen.
12th —Windsor Pear ditto ditto.
15th.—Bon Chretien Pear ditto ditto.
[illegible]th.—Green Gage Plum ditto ditto.
27th —Ash commencing to shed seed.
29th.—Sycamore ditto ditto.

F. ABBOTT, JUN.,
Superintendent.

Results of observation taken at New Norfolk February, 1876, in accordance with new forms, and registered at 7 30 a m. and 4 30 p m. :—

Barometer, mean of 2 daily readings, corrected and reduced, 29 901in

Thermometer, mean of 2 do in shade, 62 00deg F.

Ditto, ditto, 16 6deg Centigrade

Dew point, mean position of 2 ditto, 50 80deg

Elastic force of vapour mean, of 2 ditto, 372.

Humidity mean, of 2 ditto, 67.

Solar intensity, mean of maximum temperature, 132 58deg.

Terrestrial radiation, mean of minimum temperature, 42 93deg

Rainfall, ·53in.

Evaporation, 6 74in. in excess of rainfall, 6·21in.

Ozone, mean amount of 2 daily registers, 6·15.

Clouds, mean ditto, 2 ditto ditto, 4 34

Wind, force in lbs. per square foot, mean of 2, 71·41lbs.

Ditto, horizontal movement, 2715 miles

W. E. SHOOBRIDGE,
Valleyfield.

PRIVATE

Latitude 42° 52

(Registered

Bar. corrected for instrumental error and to mean sea level.		Thermometers (Reading.)			Thermometers (Self-Register)	
7·30 a.m.	4·30 p.m.	Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.
·894	29·697	12·0	49·0	64·0	111·0	72·0
·870	29·347	11·0	52·0	65·0	100·5	72·0
[illegible]4	29·982	12·5	55·0	62·0	107·0	69·0
·934	29·991	12·0	53·0	68·0	111·0	78·5
·049	30·004	12·0	54·0	68·0	110·5	76·0
·141	29·928	13·0	57·0	74·0	115·0	83·5
·927	29·769	16·0	62·0	79·0	120·0	87·0
·905	29·807	17·0	62·0	64·5	113·0	80·0
[illegible]76	30·905	12·0	54·5	65·0	100·5	72·0
·079	29·902	12·0	55·0	63·0	110·0	75·0
·900	29·783	15·0	65·0	75·5	114·0	75·5
·872	29·883	18·0	64·5	75·0	112·5	77·0
·019	29·959	18·0	64·0	82·0	120·0	90·0
·992	29·762	18·0	64·0	80·0	122·0	93·5
·113	30·248	12·5	55·0	57·0	68·5	62·5
·380	30·336	10·0	50·0	62·0	104·0	69·0
·242	30·157	8·0	48·0	62·0	103·0	71·0
·057	29·967	9·0	49·0	63·0	102·0	72·0
·909	29·845	11·5	52·2	60·0	104·5	66·5
[illegible]	29·899	10·0	50·0	67·0	109·0	77·0
[illegible]	29·863	16·0	61·0	56·5	78·0	63·0
·195	30·168	8·0	47·0	58·0	97·5	62·0
[illegible]	29·874	11·0	51·0	69·0	107·0	77.5
[illegible]	29·883	9·0	49·0	68·5	99·5	73·0
·570	29·385	15·0	59·0	70·5	111·0	83·0
·577	29·810	12·0	54·0	60·0	93·0	72·5
·978	29·829	7·0	45·0	67·5	107·0	73·0
[illegible]9	30·099	11·0	52·0	65·0	107·5	75·0
·679	29·648	10·0	51·0	72·0	72·0	76·0
[illegible]	29·522	11·0	52·0	55·0	98·5	72·0
·151	29·433	8·0	47·0	54·5	79·0	65·0
Mean Press. 29·913		Mean 12°.30	M'n Tem. 60°.34		Mean 103°.45	Mean 74°.77
Greatest do. [illegible]		Max. 18°·0	Max. 82°.0		Max. 122°.00	Max 93°.50
Least do. 29·385		Min. 7°·0	Min. 45°.0		Min. 72°.00	Min 62°·50

Meteorological form brought into use at
76 differs in some respects from the form
adopted with the view of assimilating th
ds more closely with those of static
erica, etc., in order to co-operate in a s
nal Meteorology. Readings are added 1
e thermometer, that being the instrument
e continent of Europe.
he mean is in all cases taken from the su
y registers, not from the maximum and mi
he direction of the wind is registered fror
ht of 92 feet above sea level, and its fo
re foot.
e relative quantity of rain that fell und
ls is registered each morning at 7·30 a.m.
e thirty-five years' standard tables are us
difference from average.

FRANCIS ABBOTT,

e of leafing, flowering, and fruiting of
plants in the Royal Society's Gardens
1876:—

th.—Hornbeam leaves commencing to tu
th.—Coe's Golden Drop Plum ripe.
th.—Seckle Pear commencing to ripen.
th.—Tips of Elm *(Ulmus campestris)* tur
2nd.—Horse Chestnut leaves turning bro

METEOROLOGY FOR MARCH, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52' 1[illegible] S. Longitude 9h 49m. 2[illegible] s E.

Registered for the Royal Society of Tasmania.

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4·30 p.m.	Thermometers (Reading). Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers (Self-Registering). Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent. 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m. Character.	Amount.	4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon. Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	29 8[illegible]	29 637	12·0	49 0	64 0	111·0	72 0	49 0	87	63	K	5 0	K	7 0	W	·26	SW	[illegible]			4 0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	K	[illegible]	K	[illegible]	W	[illegible]	SW	2 60	·01		4 5
				55·0	62 0	107·0	69 0	45 5	75	77	K	7 5	K	6 0	N	·26	S	·52			6 5
				53 0	68 0	111·0	78·5	45·0	86	68	K	9·5	S	2 5	NW	·0	SE	·26			6 5
				54 0	68·0	110·5	76 0	47·5	87	68	KN	10·0	K	7 0	W	·0	SE	·0			4 0
				57 0	74 0	115 0	83 5	49 5	87	66	O	·0	KS	8 0	NW	·26	NW	·26			4 0
				62 0	79 0	120·0	87 0	58 5	88	71	KN	10 0	K	7 5	N	·0	W	·52	·03		4 5
			[illegible]	62 0	64 5	113 0	80·0	58·0	82	88	K	7 5	KN	8 5	N	·0	S	2 60			4 0
				54 5	65·0	100 5	72 0	52 0	87	78	N	10 0	KN	8·5	S	·0	SE	·0	·40		6 5
10	[illegible]	[illegible]	[illegible]	55 0	63 0	110 0	75 0	50·0	93	83	KN	10 0	KS	8 0	N	·0	S	·26	·01	1 45	4 0
11	29 [illegible]	29 7[illegible]	15 0	67 0	75 5	114 0	75 5	56 5	84	70	KN	10 0	K	10·0	N	·0	W	·0			3·5
12	29 8[illegible]	29 [illegible]	18 0	64 5	75 0	112 5	77 0	57 5	88	79	KN	7·5	KN	8·5	N	·0	N	·52	·04		2 5
				64 0	82 0	120·0	90·0	60 5	85	64	O	·0	K	3 0	SE	·0	SE	·52	·07		4 0
				64 0	84·0	122 0	93 5	59 5	88	67	KN	10 0	K	6 0	NW	·0	SE	·52			2·5
				55 0	57 0	68 5	62 5	52·0	87	76	N	10 0	KN	10·0	S	·52	S	·52	·02		6 0
				50 0	62 0	104 0	69 0	43·0	74	72	K	4 0	O	·0	SE	·52	S	·26	·02		5·5
				48·0	62 0	103·0	71 0	41·5	86	77	O	0	K	8 5	NW	·0	SE	·52			4 0
				49 0	63 0	102 0	72 0	43 0	86	72	K	3 0	O	·0	NW	·0	SE	·52			4·5
			[illegible]	52 2	60 0	104 5	66 5	48 5	80	71	K	7 5	KN	8 5	SW	·0	SW	2 60			7 0
			[illegible]	50 0	67 0	109 0	77·0	45·0	86	64	K	7 0	O	·0	S	·0	S	·0	·01	1 41	4·5
			[illegible]	61 0	56 5	78 0	68 0	48 0	77	57	KN	10 0	K	5·0	NE	0	SW	5·21			5 0
				47·0	58 0	97·5	62·0	41·0	67	66	K	6·5	KS	4·0	SW	·52	SE	·52	·03		4 5
			[illegible]	51·0	69 0	107·0	77.5	43 0	74	60	K	10 0	KS	7·5	NW	·0	NW	·26	·01		5·0
			[illegible]	49·0	68 5	99·5	73·0	42 0	86	60	O	·0	K	4 0	NW	·52	SE	·52			4 0
				59 0	70·5	111 0	83·0	51·0	76	69	K	4·5	KN	10 0	NW	·52	NE	·0	·05		3·5
				54 0	60·0	93 0	72 5	44·5	70	58	K	7·0	K	2 0	NW	·26	SW	·26			5 5
			[illegible]	45 0	67·5	107 0	73·0	39 5	79	53	O	·0	K	3·0	NW	·26	NW	·0			6 0
			[illegible]	52 0	65·0	107 5	75 0	46 5	86	68	KS	7 0	KN	7·5	W	·0	SE	·0			4 0
			[illegible]	51 0	72 0	72 0	76 0	48·0	86	65	K	5·5	KN	10·0	NW	·26	N	·0			3 5
[illegible]	[illegible]	[illegible]	11 0	52 0	55·0	96 5	72 0	48·0	74	69	KN	8·0	KN	6 0	N	·0	NW	·52	·34		5·5
31	29 451	29 433	8·0	47·0	54·5	79 0	65 0	39 0	61	70	N	9 0	KN	10·0	S	·26	NW	·26	·15	0 60	6·0
Mean Press. [illegible]	Mean [illegible]	M'n Tem. 60°·34				Mean 1[illegible]	Mean 74°·77	Mean 74°·77	Mean. ·75		Mean for Month. [illegible]				Mean Force ·42 lb.				T[illegible] [illegible]	T[illegible] [illegible]	T[illegible] 145
Highest do. 30 380	Max 18°·0	Max. 82°.0				Max. 122° 00	Max 93°.50	Max 60°.50	Max. 93		Prevailing Character.				Greatest Force. 5 21 lb.						Mean 4·68
Least do. 29 385	Min. 7°·0	Min. 45°·0				Min. 72° 00	Min. 62°·50	Min. 39°.00	Min. ·53		K and KN				Least Force. 0						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a m

The thirty-five years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering, and fruiting of a few standard plants in the Royal Society's Gardens during March, 1876:—

13th —Hornbeam leaves commencing to turn brown.
16th —Coe's Golden Drop Plum ripe.
17th —Seckle Pear commencing to ripen
[illegible] —[illegible] Elm [illegible] turning yellow.
[illegible] —[illegible] leaves turning brown.
26th —Ash leaves commencing to fall.
[illegible] Oak ditto ditto. Acorns ripe.

F. ABBOTT, JUN.,
[illegible]tendent.

Results of observations taken at New Norfolk for March, 1876, in accordance with new forms, and registered at 7 30 a m. and 4 30 p m. :—

Barometer, mean of 2 daily readings, corrected and reduced, 29 953in.
Thermometer, mean of 2 ditto, 60·35deg
Dew point, mean position of 2 ditto, 51 [illegible]deg
Elastic force of vapour mean, of 2 ditto, ·3[illegible].
Humidity of air, mean of 2 ditto, 73
Solar intensity, mean of maximum temperature, 128·83deg.
Terrestrial radiation, mean of minimum temperature, 4[illegible]deg
Rainfall, ·89in.
Evaporation, 4 24in in excess of rainfall, 3 35in.
Clouds, mean amount of 2 daily oberservations, 5·96.
Ozone, mean ditto, 2 ditto ditto, 6 22.
Wind, ditto, 2 ditto ditto, 40·57lbs.
Ditto, horizontal movement, 2103 miles.
Electricity, 62 observations, 33 negative, 7 positive, 22 *nil*.

Rainfall at Hull Station, 1,[illegible]ft above sea level, [illegible]9 inches.

W E SHOOBRIDGE,
Valleyfield.

METEORO

PRIVATE OBS

Latitude 42° 52′ 13

(Registered fo

Bar. corrected for temperature instrumental error, and to mean sea level.		Thermometers (Reading.)			Thermometers (Self-Registering		
7·30 a.m.	4·30 p.m.	Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass,
29·641	29·622	11·0	51·0	57·0	99·0	65·0	40
29·643	29·614	9·0	48·0	60·0	95·0	67·5	42
29·538	29·390	10·0	50·5	57·5	93·5	69·0	43
29·423	29·420	9·0	49·0	57·5	86·5	63·0	44
29·449	29·483	7·5	45·0	54·5	64·0	58·5	41
29·626	29·622	6·0	45·0	62·0	97·5	68·5	36
29·754	29·756	10·0	50·0	55·5	64·0	63·0	45
29·892	29·959	9·5	49·5	52·0	99·0	60·0	43
30·148	30·176	8·5	47·5	56·0	94·0	58·5	4
30·311	30·265	5·5	42·0	60·0	99·5	68·0	3
30·302	30·234	6·5	44·0	59·5	95·5	65·0	3
30·253	30·238	9·5	49·5	63·0	101·0	72·0	4
30·092	29·955	9·0	49·0	67·0	101·0	72·0	4
29·992	29·955	11·0	51·0	64·5	98·5	71·5	4
29·824	29·697	13·0	51·0	69·0	93.5	72·0	5
29·742	29·715	8·0	46.0	59·0	96·0	68·0	4
29·745	29·721	8·0	47·0	58·0	88·5	64·0	4
29·650	29·554	12·0	54·0	61·0	69·0	63·5	4
29·782	29·713	11·0	53·0	61·0	75·0	64·0	4
29·848	29·667	8·0	47·0	62·5	90·5	65·0	4
29·641	29·677	10·0	50·0	55·5	95·5	64·5	4
29·593	29·782	9·0	49·0	50·0	87·0	61·0	4
30·198	30·179	6·0	43·0	55·0	87·0	62·0	3
30·042	29·802	11·0	53·0	69·0	92·0	73·0	4
29·992	29·976	8·0	47·0	53·0	92·0	70·0	4
29·950	30·024	7·0	45·0	56·5	94·5	68·5	4
29·958	29·685	5·0	42·0	54·0	86·0	65·0	[illegible]
29·546	29·763	8·0	47·0	47·0	67·0	59·0	4
29·742	29·711	5·0	41·0	54·0	87·0	56·5	[illegible]
29·583	29·733	10·0	51·0	53·0	71·5	55·0	[illegible]
Mean Press. 29·816		Mean 8°·65	M'n. Tem. 52·93		Mean. 88°·66	Mean 65°·08	M 4
Greatest do. 30·311		Max. 13·0	Max. 69·00		Max. 101·00	Max. 72·0	M 5
Least do. 29·390		Min. ·50	Min. 41·00		Min. 64·00	Min. 53·0	M 3

e Meteorological form brought into use at th
·76 differs in some respects from the former
adopted with the view of assimilating the I
ds more closely with those of stations in Euro
in order to co-operate in a system of I
orology. Readings are added from the cen
eter, that being the instrument generally
nent of Europe.

e mean is in all cases taken from the sum
registers, not from the maximum and minin
e direction of the wind is registered from
t of 92 feet above sea level, and its forc
re foot.

e relative quantity of rain that fell under
s is registered each morning at 7·30 a.m.

e 35 years' standard tables are used for
rence from average.

FRANCIS ABBOTT, F.I

of leafing, flowering and fruiting of a
plants in the Royal Society's Gardens duri
of April, 1876.

1.—Coe's fine late Red Plum commencing
1.—Elm leaves commencing to fall.
h.—Chinese Chrysanthemums commence t
h.—Mountain Ash leaves commence to fa

METEOROLOGY FOR APRIL, 1876.

Private Observatory, Hobart Town.

Latitude 42° 52′ 13″ S.; Longitude 9h. 49m. 20·2s. E.

(Registered for the Royal Society of Tasmania.)

Day of Month	Bar. corrected for temperature, instrumental error, and to mean sea level: 7·30 a.m.	Bar.: 4·30 p.m.	Thermometers (Reading): Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers Self-Registering: Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent: 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m.: Character.	Amount.	Clouds. 4·30 p.m.: Character.	Amount.	Wind. 7·30 a.m.: Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m.: Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon. Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	29·641	29·622	11·0	51·0	57·0	[illegible]	[illegible]	40·0	80	71	KN	7·5	K	10·0	SW	·52	S	[illegible]	·21		7·0
2	29·643	29·614	9·0	45·0	60·0	95·0	67·5	42·0	80	62	K	3·0	K	8·5	SW	·0	W	·52	·01		5·5
3	29·558	29·390	10·0	50·5	57·5	93·5	69·0	43·5	68	81	K	10·0	KN	7·0	NW	·52	W	·52	·04		4·0
4	29·423	29·420	9·0	49·0	57·5	86·5	63·0	44·0	74	61	K	7·0	KN	10·0	NW	·0	N	·26			4·5
5	29·449	29·483	7·5	45·0	54·5	64·0	58·5	41·0	86	75	K	9·5	K	7·5	SW	·0	SE	·0	·03		5·0
6	29·626	29·622	6·0	45·0	62·0	97·5	65·5	36·5	84	52	KS	7·5	K	7·0	SW	·26	W	0	·07		7·0
7	29·754	29·756	10·0	50·0	55·5	64·0	63·0	45·0	93	87	N	10·0	KN	9·0	W	0	SE	0	·02		4·5
8	[illegible]	[illegible]	9·5	49·5	52·0	99·0	60·0	43·0	86	80	K	8·0	KN	9·0	S	0	SE	·52			5·5
9	30·148	30·170	8·5	47·5	56·0	94·0	58·5	40·5	79	70	K	6·0	K	9·5	S	·26	SW	0			5·0
10	30·311	30·265	5·5	42·0	60·0	99·5	65·0	35·0	84	72	K	2·0	O	0	NW	0	SE	·26		1·34	3·0
11	[illegible]	30·234	6·5	44·0	59·5	95·5	65·0	38·0	79	71	O	·0	O	·0	NW	·26	S	·52			6·5
12	[illegible]	30·238	9·5	49·5	63·0	101·0	72·0	45·0	86	78	O	·0	O	·0	W	·26	S	·0			4·0
13	[illegible]	[illegible]	9·0	49·0	67·0	101·0	72·0	44·0	86	52	K	7·0	K	3·0	W	·26	W	·52	·15		5·0
14	[illegible]	[illegible]	11·0	51·0	64·5	98·5	71·5	49·5	80	82	K	10·0	K	10·0	W	·0	SE	·0			4·5
15	29·824	[illegible]	13·0	51·0	69·0	93.5	72·0	50·0	61	68	K	10·0	KN	7·5	W	·26	NW	.0			7·0
16	29·732	29·715	8·0	43·0	59·0	96·0	68·0	44·0	86	71	KN	8·5	K	2·0	W	·0	W	·26			6·5
17	29·745	29·721	8·0	47·0	58·0	88·5	64·0	44·0	86	66	K	4·0	KN	10·0	NW	·0	W	·26			5·0
18	29·651	29·554	12·0	54·0	61·0	69·0	63·5	45·5	81	82	KN	10·0	KN	10·0	N	·26	SE	·0	·02		4·5
19	29·782	29·713	11·0	53·0	61·0	75·0	64·0	46·0	93	67	N	10·0	N	10·0	S	·0	W	·52	·17		4·0
20	[illegible]	29·687	[illegible]	47·0	62·5	90·5	65·0	42·0	86	72	KN	10·0	N	10·0	NW	·0	NW	·0	·07	.74	6·0
21	[illegible]	29·677	10·0	50·0	55·5	95·5	64·5	41·5	86	81	K	5·5	KN	9·0	S	·26	N	2·60	·20		7·0
22	[illegible]	[illegible]	9·0	49·0	50·0	87·0	61·0	44·0	79	86	N	10·0	KN	8·5	SW	5·21	SW	·52	·25		7·5
23	30·198	30·179	6·0	43·0	55·0	87·0	62·0	39·0	77	70	K	8·0	K	7·0	W	·0	NW	·26	·21		6·0
24	30·042	29·802	11·0	53·0	60·0	92·0	73·0	41·5	69	60	KN	10·0	KN	10·0	NW	·26	W	5·21	·01		4·5
25	[illegible]	[illegible]	8·0	47·0	53·0	92·0	70·0	42·0	79	74	K	10·0	KN	10·0	S	·0	NW	·26			3·5
26	[illegible]	30·024	7·0	45·0	56·5	94·5	68·5	40·5	86	70	K	3·0	K	3·0	NW	·0	W	·0	·01		7·0
27	[illegible]	[illegible]	5·0	42·0	54·0	[illegible]	[illegible]	37·0	84	86	K	10·0	KN	7·5	W	0	W	·26			6·0
28	[illegible]	29·763	8·0	47·0	47·0	67·0	59·0	41·5	86	79	KN	7·5	K	6·0	NW	·0	W	·0	·08		6·5
29	[illegible]	29·711	5·0	41·0	54·0	87·0	56·5	36·0	84	74	KN	10·0	KN	10·0	SW	·0	W	·0	·24		6·0
30	[illegible]	29·733	10·0	51·0	53·0	71·5	55·0	42·5	74	74	K	5·0	K	7·5	SE	·0	SW	2·60	·02	·97	6·0

Bar.	Centigrade	Fahrenheit	Sun	Shade	Grass	Humidity	Clouds	Wind	Rain	Evap.	Ozone
Mean Press. [illegible]	Mean 8·[illegible]	M'n. Tem. 52·03	Mean. [illegible]	Mean 65·65	Mean 42·12	Mean. ·77	Mean for Month. 7·20	Mean Force ·45 lb.	Tl. 1·52	Tl. 3·05	Tl. 164
Greatest do. 30·311	Max. 13·0	Max. 69·00	Max. 101·00	Max. 72·0	Max. 50·00	Max. ·93	Prev. Character, K and KN.	Greatest Force 5·21			Me'n 5·47
Least do. 29·390	Min. ·50	Min. 41·00	Min. 64·00	Min. 53·0	Min. 35·00	Min. ·52		Least Force. 0			

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7·30 a.m.

The 35 years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during the month of April, 1876.

5th.—Coe's fine late Red Plum commencing to ripen.
6th.—Elm leaves commencing to fall.
12th.—Chinese Chrysanthemums commence to flower.
25th.—Mountain Ash leaves commence to fall.
28th.—Seeds of Hornbeam ripe.
29th.—Black Mulberry leaves commence falling.

F. ABBOTT, Jun., Superintendent

Results of observations taken at New Norfolk for April, 1876, in accordance with new forms, and registered at 7·30 a.m. and 4·30 p.m.:—

Barometer, mean of two daily readings, corrected and reduced, 29·810in.
Thermometer, mean of 2 ditto, 50·90deg.
Dew point, mean position of 2 ditto, 40·80deg.
Elastic force of vapour mean, of 2 ditto ·255.
Humidity of air, mean of 2 ditto, ·68.
Solar intensity, mean of maximum temperature, 114·66deg.
Terrestrial radiation, mean of minimum temperature, 36·10deg.
Rainfall, 1·94in.
Evaporation, 2·20in., in excess of rainfall ·26in.
Clouds, mean amount of 2 daily observations, 6·20.
Ozone, mean ditto, 2 ditto ditto, 7·00.
Wind force in lbs. per square foot of 2 ditto ditto, 39·28lbs.
Ditto, horizontal movement, 1,772 miles.
Electricity, 52 observations, 29 negative, 7 positive, 16 *nil*.

W. E. SHOOBRIDGE, Valleyfield.

Latitude 42° 52′

(Registered

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermomete (Self-Registeri Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.
1	29·924	29·856	3·0	37·0	54·0	87·5	62·0
2	29·734	29·829	12·0	54·0	54·0	90·5	65·5
3	30·128	30·222	8·0	46·0	53·0	91·5	65·0
4	30·2[illegible]1	30·218	5·0	41·0	59·0	90·5	67·5
5	30·10[illegible]	30·049	6·0	43·0	53·0	[illegible]9·5	60·5
6	29·9[illegible]6	29·8[illegible]	4·0	49·0	56·0	84·5	59·0
7	29·072	30·0[illegible]	9·0	49·0	53·0	56·5	55·0
8	30·1[illegible]8	30·120	8·0	47·0	53·0	92·0	62·0
9	29·960	29·705	7·5	37·5	53·0	85·0	59·0
0	29·614	29·787	10·5	50·5	49·0	87·5	58·5
1	29·920	29·912	8·0	38·0	51·0	66·0	55·0
2	29·586	29·422	6·5	43·5	55·0	88·5	63·0
3	29·667	29·950	3·5	38·5	45·0	65·0	57·5
4	30·383	30·390	7·5	46·0	51·0	91·5	61·0
5	30·333	30·289	4·5	40·5	54·5	74·0	59·0
6	30·469	30·380	2·0	37·0	52·0	90·5	62·0
7	30·324	30·378	1·0	32·0	53·0	88·0	63·5
8	30·310	30·223	8·0	47·0	56·5	94·0	67·0
9	30·190	30·166	8·0	45·0	55·0	92·0	66·0
0	30·208	30·192	9·0	40·0	50·0	64·5	59·0
1	30·211	30·186	5·0	41·0	51·0	85·0	59·0
2	30·0[illegible]	29·992	3·0	38·0	55·5	84·5	58·5
3	29·750	29·737	5·0	41·0	52·5	83·5	58·0
4	29·782	29·874	13·0	56·0	55·0	70·0	60·0
5	29·815	29·970	9·0	49·0	55·0	60·5	57·0
6	30·250	30·2[illegible]	5·5	42·0	52·0	85·0	60·0
7	30·2[illegible]	30·233	2·0	36·0	51·0	77·5	58·0
8	30·270	30·055	4·0	40·0	49·0	61·0	54·0
9	29·9[illegible]	28·924	5·0	42·0	58·5	83·5	62·5
0	29·[illegible]52	29·5[illegible]	9·0	49·0	56·0	74·0	59·0
1	29·5[illegible]	29·[illegible]	10·0	50·0	50·0	82·0	58·0
	Mean Press. 29·993		Mean 6·5	M'n Tem. 48·13		Mean 81·18	Mea 60·4
	Greatest do. 30·469		Max. 13·0	Max. 59·00		Max. 94·00	Ma 67·5
	Least do. 28·924		Min. 1·0	Min. 35·00		Min. 52·5	Mi 54·(

The Meteorological form brought into use a 1876 differs in some respects from the forn en adopted with the view of assimilating tl ords more closely with those of stati nerica, etc., in order to co-operate in a ional Meteorology. Readings are added de thermometer, that being the instrumen the continent of Europe.

The mean is in all cases taken from the s ly registers, not from the maximum and m

The direction of the wind is registered fro ght of 92 feet above sea level, and its f are foot.

The relative quantity of rain that fell unc ds is registered each morning at 7·30 a.m.

The thirty-five years' standard tables are u difference from average.

FRANCIS ABBOTT,

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ne of leafing, flowering, and fruiting of plants in the Royal Society's Gardens d of May, 1876:—

NOTE.—Owing to the absence of heavy tumn months of 1876, the plants usual ver in May were very backward; none ded flowers up to the beginning of June e accounted for by the dryness of the su

Private Observatory, Hobart Town.

Latitude 42° 52′ 13″ S ; Longitude 9h. 49m. 29.-2s. E.

Registered for the Royal Society of Tasmania.)

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4 30 p.m.	Thermometers (Reading) Centigrade, 7·30 a.m.	Thermometers (Reading) Fahrenheit, 7·30 a.m.	Thermometers (Reading) Fahrenheit, 4 30 p.m.	Thermometers (Self Registering) Highest in Sun, 4 30 p.m.	Thermometers (Self Registering) Highest in Shade, 4 30 p.m.	Thermometers (Self Registering) Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent 7·30 a.m.	Relative Humidity. Per cent 4·30 p.m.	Clouds 7·30 a.m. Character.	Clouds 7·30 a.m. Amount.	Clouds 4·30 p.m. Character.	Clouds 4·30 p.m. Amount.	Wind 7·30 a.m. Direction from.	Wind 7·30 a.m. Force in lbs. per square foot.	Wind 4·30 p.m. Direction from.	Wind 4·30 p.m. Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon Evap. 7 30 a.m.	Ozone, Chrom. Scale. 7·30 a.m.
1	29·924	29·876	3 0	37 0	4 0	87 5	62 0	32 5	92	69	O	·0	K	10 0	SW	·0	W	2 60			5 5
2	29 734	29 820	12·0	54·0	54 0	90 5	65 5	41 0	61	69	K	6·0	K	6·5	SW	5·21	SE	·26			3 5
3	30 128	30·222	8 0	46 0	53 0	91·5	65·0	41 0	79	69	K	5·5	K	4·0	N	·0	SW	·0			4·5
4	30 261	30·218	5·0	41 0	59·0	90·5	67 5	32·5	85	76	KS	7·0	O	·0	SW	·26	NW	·0			4·0
5	30·106	30 049	6 0	43 0	53 0	93 5	60 5	37 0	92	86	KS	10·0	O	·0	W	·0	SE	·0			5 0
6	29 986	29·899	4 0	40 0	56·0	84 5	59 0	32 5	92	87	K	5·0	KS	10·0	NW	·52	SE	·0			4·5
7	29 072	30·036	9·0	49 0	53·0	56 5	55 0	44·0	93	80	K	9·0	KS	8 5	SW	·0	SE	·0			4·0
8	30 168	30 129	8·0	47·0	53 0	92 0	62 0	43·5	86	74	K	10 0	K	9·0	S	·0	SE	·26			5·0
[illegible]	29·960	29 705	7·5	37 5	53 0	85 0	59 0	31 5	91	80	O	·0	K	5 0	W	·0	NW	·0			5·5
10	[illegible]	[illegible]	10 5	50·5	49 0	87·5	58 5	37 0	86	68	N	10·0	KN	7·0	NW	·26	NW	·52	·01	·55	6·0
11	[illegible]	[illegible]	8 0	38 0	51·0	66 0	55·0	30·5	84	80	K	8 0	K	10·0	W	·26	NW	·0	·03		5·5
12	[illegible]	[illegible]	6 5	43·5	55 0	88 5	63 0	33 5	84	52	K	2·0	N	10 0	NW	·26	SW	·52	·48		3·5
13	29 667	29·950	3 5	33·5	45 0	65·0	57 5	34 0	84	85	N	10 0	KN	8·5	NW	·0	SE	·0			6·0
14	30 383	30 399	7 5	46·0	54 0	91·5	64 0	34 5	86	80	KN	5·0	K	7 0	NW	·52	NE	·0	·04		7·0
15	30 333	30 289	4 5	40·5	54 5	74·0	59·0	35·0	92	74	K	10 0	K	7 5	S	·0	W	·0	·01		4 0
16	30·460	30·380	2 0	35·0	52·0	90 5	62 0	32·0	91	86	K	5·5	O	·0	SW	·0	SW	·0			2 5
17	30 324	30·378	1·0	32 0	53 0	88 0	63 5	30 0	82	80	K	5·0	O	0	SW	·0	S	·0			2 5
18	30 310	30 223	8·0	47 0	56 5	94·0	67 0	35 0	79	65	K	7·0	K	4 0	NW	·26	NW	·26			4 0
19	30 193	30·166	8 0	45 0	55 0	92 0	66 0	37 5	86	75	K	1 0	K	6 0	S	·26	SW	·0			4·0
20	30 208	30 192	9 0	40·0	50·0	64 5	59·0	35 0	92	74	K	7·0	KN	9·5	SW	·0	NW	·0		·44	3 5
21	30 211	30 186	5·0	41·0	51·0	85 0	59 0	33 5	92	80	KN	9·5	K	3 0	W	·0	SW	·0			7 0
22	30 006	29 902	3·0	38·0	55 5	84·5	58·5	32·0	96	75	KS	8·0	O	·0	NW	·0	SW	·0			4·5
23	29·750	29·737	5 0	41·0	52 5	83 5	58·0	35·0	92	69	KS	5·0	K	3·0	NW	·0	SW	2 60	·04		5·0
24	29 782	29·874	13·0	56·0	55 0	70 0	60·0	40·5	61	81	KN	5 5	K	5 0	S	20 0	NW	·0			7·5
[illegible]	29·815	29 970	9 0	40·0	55 0	60·5	57 0	44 0	80	87	K	7·0	KN	10·0	NW	·0	S	·26	·01		5 0
26	30·250	30 2[illegible]	5 5	43 0	52 0	85 0	60·0	38·0	92	86	O	·0	K	3·0	SW	·0	S	·26	·05		5·5
[illegible]	[illegible]	[illegible]	2 0	33 0	51 0	77 5	58 0	30 5	9[illegible]	86	K	7 0	KS	4 5	NW	0	NW	·0	·01		4 0
[illegible]	[illegible]	[illegible]	4 0	41 0	41 0	61 0	54 0	33 0	92	[illegible]	K	[illegible]	KN	[illegible]	NW	·0	NW	·26			3 5
29	29 990	29 924	5 0	42·0	58 5	83·5	62·5	32 0	92	93	K	7·0	K	7·0	W	·0	NW	·0	·15		4 5
[illegible]	29·652	29 530	9 0	49 0	56 0	74 0	59·0	42 5	93	93	N	10·0	N	10 0	N	·0	NE	·0			7·0
31	29 348	29 433	10·0	50 0	50·0	82·0	58 0	44 0	74	93	K	6·0	K	3 0	NW	2·30	NW	·52		·25	7·5
	Mean Press. 29·903		Mean 6 5	Mean Max. Tem. 48·13		Mean 81·18	Mean 60 45	Mean 36·18	Mean ·82		Mean for Month. 6 09				Mean Force. ·55 lb.				Tl. ·83	Tl 1·24	Tl. 151
	Greatest do. 30 469		Max. 13·0	Max. 59·00		Max. 94 00	Max. 67·50	Max 44 00	Max. ·96		Prevailing Character. K				Greatest Force. 20 0 lb.						Mean 4·87
	Least do. 28 924		Min. 1 0	Min. 35 00		Min. 52 5	Min. 54·00	Min. 31·50	Min. ·52						Least Force. 0						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a m.

The thirty-five years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering, and fruiting of a few standard plants in the Royal Society's Gardens during the month of May, 1876 :—

Note.—Owing to the absence of heavy rains during the Autumn months of 1876, the plants usually commencing to flower in May were very backward ; none of them had expanded flowers up to the beginning of June : this is no doubt to be accounted for by the dryness of the subsoil.

The plants usually flowering are Coronilla glauca, Photinia serrulata, Diosma alba, and Spiræa prunifolia.

F. ABBOTT, Jun., Superintendent.

Results of observations taken at New Norfolk for May, 1876, in accordance with new forms, and registered at 7 30 a m. and 4 30 p.m. : —

Barometer, mean of 2 daily readings, corrected and reduced, 29·94in.

Thermometer, mean of 2 ditto, 45·90deg

Dew point, mean position of 2 ditto, 41·50deg.

Humidity of air, mean of 2 ditto, ·80.

Elastic force of vapour mean, of 2 ditto, ·263.

Solar intensity, mean of maximum temperature, 104·25deg.

Terrestrial radiation, mean of minimum temperature, 32 74deg.

Rainfall, ·82in.

Evaporation, 1·26in. in excess of rainfall, ·44in.

Ozone, mean ditto, 2 ditto ditto, 6 77.

Clouds, mean amount of 2 daily observations, 5·75.

Wind, force in lbs. per square foot of 2 ditto ditto, 47·38lbs.

Ditto, horizontal movement, 2012 miles.

Electricity, 62 observations, 28 negative, 8 positive, 26 *nil*.

W. E. SHOOBRIDGE, Valleyfield.

Rainfall at Hill Station, 1,550ft. above sea level, 1·47in.

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermom (Self-Regist Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.
1	29·570	29·546	3·0	37·0	46·0	76·0	56·
2	29·770	29·792	6·0	43·0	50·0	75·0	52·
3	29·850	29·751	7·5	46·0	56·0	81·0	62
4	29·800	29·907	10·0	50·5	51·5	75·5	57·
5	30·024	30·034	1·0	35·0	52·0	86·5	58
6	30·027	29·945	3·0	38·0	49·0	65·0	53·
7	29·960	29·902	5·0	41·0	47·5	72·0	55·
8	29·989	29·962	5·0	42·0	48·5	65·5	54·
9	30·002	30·032	6·5	44·0	54·0	73·5	58·
10	30·036	29·820	9·0	49·0	55·0	65·5	59·
11	29·878	29·776	11·5	53·5	58·5	59·5	59·
12	29·732	29·528	13·0	56·0	59·0	62·0	59
13	29·252	29·125	13·5	57·0	54·0	60·0	60
14	29·155	29·416	7·0	45·0	46·0	74·5	62
15	29·495	29·496	2·0	35·5	48·0	76·0	55
16	29·112	29·090	6·0	43·0	45·5	64·0	52
17	29·578	29·858	2·0	35·5	42·0	68·5	48
18	30·127	30·081	3·0	38·0	44·5	55·0	55
19	29·903	30·112	10·5	51·5	55·0	65·5	53
20	30·011	29·916	8·0	47·0	55·0	79·5	60
21	30·164	30·195	5·0	40·0	47·0	67·0	55
22	30·258	30·240	6·0	43·0	49·0	71·0	58
23	30·208	30·182	7·5	46·0	54·0	80·5	60
24	30·203	30·225	6·0	43·0	52·0	84·5	61
25	30·324	30·289	2·0	36·0	51·5	84·5	6
26	30·334	30·307	1·0	35·5	46·5	72·0	5
27	30·025	29·898	3·5	39·0	48·0	58·5	5
28	29·612	29·765	6·5	44·0	44·0	68·0	5
29	29·889	29·852	4·0	40·0	53·5	76·5	5
30	29·931	29·746	6·0	43·0	54·0	74·5	5

Mean Press. 29·868	Mean 6·00	M'n. Tem. 46·89	Mean 71·23	M 5
Greatest do. 30·289	Max. 13·50		Max. 86·50	M 6
Least do. 29·090	Min. 1·00		Min. 55·00	M 5

The Meteorological form brought into use
of 1876 differs in some respects from the fo
been adopted with the view of assimilating
records more closely with those of sta
America, etc., in order to co-operate in a
national Meteorology. Readings are adde
grade thermometer, that being the instrum
on the continent of Europe.

The mean is in all cases taken from the
daily registers, not from the maximum and

The direction of the wind is registered
height of 92 feet above sea level, and its
square foot.

The relative quantity of rain that fell u
winds is registered each morning at 7·30 a.

The thirty-five years' standard tables are
the difference from average.

FRANCIS ABBOT

Time of leafing, flowering, and fruiting
plants in the Royal Society's Gardens
of June, 1876:—

10th.—Diosma alba in flower.
20th.—Calycanthus præcox in flower.
25th.—Pyrus japonica commencing to f
30th.—Snowflake commencing to flowe
leaves all shed; Osage orange leaves all sh

F. ABBOTT, Jun.

Private Observatory, Hobart Town.

Latitude 42° 52′ 13″ S.; Longitude 9h. 49m. 29·2s. E.

Registered for the Royal Society of Tasmania

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7 30 a m.	4 30 p m.	Thermometers (Reading) Centigrade, 7 30 a m.	Fahrenheit, 7 30 a m.	Fahrenheit, 4 30 p m.	Thermometers (Self-Registering) Highest in Sun, 4 30 p m.	Highest in Shade, 4 30 p m.	Lowest on Grass, 7 30 a m.	Relative Humidity, Per cent 7 30 a m.	4 30 p m.	Clouds. 7·30 a m. Character.	Amount.	Clouds. 4·30 p.m. Character.	Amount.	Wind. 7·30 a m. Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m. Direction from.	Force in lbs per square foot.	Rain in Inches. 7 30 a m	Spon. Evap. 7 30 a m	Ozone. Chrom. Scale. 7 30 a m
1	29·570	29 546	3·0	37 0	46 0	76·0	56·0	33 5	84	73	K	5·0	K	3·0	NW	·0	NW	·26	·03		4·5
2	29·770	29 792	6 0	43·0	50·0	75 0	52 5	34·0	78	80	K	4 0	KN	9 0	NW	·52	N	·26			5 5
3	29 [illegible]	29 751	7 5	46 0	56 0	81 0	62 0	40 0	93	70	KS	5·5	KN	9·5	NW	·26	W	·52			5 0
4	29 800	29 907	10 0	50 5	51·5	75·5	57 0	42 5	69	86	K	8·0	O	·0	NW	·26	SW	·0			4 0
5	30 024	30·034	1·0	35 0	52 0	86·5	58 5	31·5	100	69	O	·0	O	·0	SW	·0	W	·0			6 0
6	30·027	29·945	3·0	33 0	49 0	65 0	58 0	30 0	92	86	KS	7·0	KS	6·0	NW	·0	SE	·0			4 5
7	29·960	29 992	5·0	41·0	47·5	72 0	55·0	29 0	92	93	K	7·5	KN	9·0	NW	·0	NW	·0			5·5
8	29 [illegible]	[illegible]	5 0	42 0	45 [illegible]	65 5	54 5	37 [illegible]	92	93	KN	9·0	K	4 5	NW	·26	NW	·0	·02		6 0
9	30 0[illegible]2	30 032	6 5	44 0	54 0	73 5	58 0	40 [illegible]	93	[illegible]	K	6 0	K	7 0	SW	·0	SE	0			5 5
10	30 0[illegible]	29 820	9 0	49 0	55 0	75 5	53 5	35 5	80	65	K	5 5	K	6 5	NW	2 [illegible]	NW	52			6 0
11	29 [illegible]	29 770	11 5	53 5	58 5	79 5	51 0	45 0	74	61	KN	8 0	KN	9 [illegible]	NW	·52	NW	2 [illegible]	62	55	5 0
12	29 732	29 5[illegible]	13 0	56 0	59 0	62 0	51 0	47 0	6[illegible]	61	KN	9 0	KN	6 0	SW	2 [illegible]	NW	2 [illegible]	04		6 5
13	29·252	29 125	13 5	57 0	54 0	60 0	60 0	45 5	[illegible]	70	K	6 5	N	10 0	W	26 04	NW	5 21			4 0
14	29 155	29·416	7·0	45·0	46·0	74·5	62·5	42 0	86	73	N	8·0	KS	6·0	SW	·26	NW	2·60	1·73		7 5
15	29·495	29·496	2 0	35 5	48 0	76·0	55 0	29 0	91	86	KS	5·0	K	4·5	SW	·26	NW	·0	·02		4 5
16	29 112	29 [illegible]	6 0	43 0	45·5	64 0	52 0	35 0	84	73	KN	9·0	KN	7·0	NW	·26	NW	5·21	·24		7·0
17	29 575	29 855	2 0	35 5	42 0	63 5	43 5	33 5	93	78	K	4 5	K	2 0	S	·0	N	26	·03		5 0
18	30 127	30·081	3·0	38 0	44 5	55 0	55·0	29 0	84	78	KS	7·0	K	10 0	NW	·26	NW	·26			4·5
19	29 993	30·112	10·5	51·5	55·0	65 5	53 0	41·5	50	69	KS	8·0	K	7·5	W	2·60	NW	·0			5 0
20	30·011	29 916	8 0	47·0	55·0	79·5	60 0	40 0	79	70	K	5·5	K	7·0	NW	·26	NW	·26		2 22	4 0
21	30·164	30·195	5·0	40·0	47·0	67·0	55 0	35·5	78	86	KN	8 0	K	6·5	S	·0	SW	·0	·01		5 5
22	30 [illegible]	30·240	6·0	43·0	49 0	71·0	58 5	30 0	85	80	K	3·0	K	5·0	SW	·0	S	·26	·02		7 0
23	30 208	30 182	7·5	46·0	54·0	80 5	60·0	37·0	79	86	K	6·5	KN	4·5	W	·26	W	·26			4·5
24	30 203	30·225	6·0	43 0	52 0	84 5	61 0	37 5	85	86	K	6 0	KS	5·5	W	·0	S	·26	·03		6 0
25	30 324	30 28[illegible]	2 0	36 0	51 5	84 5	60 0	31 0	83	89	O	·0	K	1·0	W	·0	S	·26	·01		5 5
26	30 [illegible]	30 307	1 0	35 5	46 5	72 0	55 5	31 0	91	93	O	0	K	7 5	W	·2[illegible]	W	·26			5 0
27	30 [illegible]	29 8[illegible]	3 5	39 0	45 0	58 5	52 0	31 5	92	[illegible]	KS	10 0	KS	[illegible]	W	·52	W	0			6 0
28	29 612	29 765	6 5	44 0	44 0	65 0	54 0	37 0	92	78	KN	10 0	K	3 5	S	0	W	2 [illegible]	03		4 5
29	29 [illegible]	29 [illegible]	4 0	49 0	53 5	76 5	5[illegible]	31 5	77	64	K	[illegible]	KS	6 0	NW	·2[illegible]	W	26	·05		3 5
30	29 [illegible]	29 746	6 0	43 0	54 0	74·5	57 5	35 0	57	59	KS	2 5	KS	6 0	NW	·2	NW	2·60		50	4 0

Mean Press. 29·868	Mean 6·00	M'n. Tem. 46·89	Mean 71·23	Mean 56·65	Mean 35·63	Mean. ·80	Mean for Month. 6 0	Mean Force, 1·10.	Tl 2 28	Tl 3 27	Tl. 158 0
Greatest do. 30·259	Max. 13·50		Max. 86 50	Max. 62·50	Max. 47·00	Max. 1 00	Prevailing Character. K KN & KS	Greatest Force, 26 04.			Mean 5·27
Least do. 29 099	Min. 1·00		Min. 55·00	Min. 52·00	Min. 29 00	Min. ·57		Least Force, 0			

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a.m.

The thirty-five years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering, and fruiting of a few standard plants in the Royal Society's Gardens during the month of June, 1876:—

10th.—Diosma alba in flower.

20th.—Calycanthus præcox in flower.

25th.—Pyrus japonica commencing to flower.

30th.—Snowflake commencing to flower; Black Mulberry leaves all shed; Osage orange leaves all shed.

F. ABBOTT, Jun., Superintendent.

Results of observations taken at New Norfolk for June, 1876, in accordance with new forms, and registered at 7 30 a.m. and 4 30 p.m.:—

Barometer, mean of 2 daily readings, corrected and reduced, 29·897in; max., 30·40 on 25th; min., 29 11 on 10th.

Thermometer, mean of 2 ditto, 44·21deg.

Dew point, mean position of 2 ditto, 39·66deg.

Elastic force of vapour mean, of 2 ditto, ·245.

Humidity mean of 2 ditto, 85.

Solar intensity, mean of maximum temperature, 97·83deg.

Terrestrial radiation, mean of minimum temperature, 32 23deg.

Rainfall, 2 30in in excess of evaporation, 10in.

Evaporation, 2 20in.

Clouds, mean of 2 daily registers, 5 65.

Ozone, mean ditto, 2 ditto ditto, 7 80.

Wind, force in lbs. per square foot total of 2 ditto ditto, 42·85lbs.

Horizontal movement, 2,350 miles; 1,070 miles from 10th to 14th.

Electricity, 59 observations, 18 negative, 14 positive, 27 *nil.*: active on 4th, 11th, 12th, 19th, and 28th.

Highest flood since 1863 in the Styx River on the 14th.

W. E. SHOOBRIDGE, Valleyfield.

METEOROLC

PRIVATE OBSEI

Latitude 42° 52′ 13″ S

(Registered for th

Bar. corrected for instrumental error and to mean sea level.		Thermometers (Reading.)			Thermometers (Self-Registering.)		
7·30 a.m.	4·30 p.m.	Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.
·715	29·738	8·5	47·5	49·5	70·0	55·0	42·0
·120	30·092	2·5	37·0	51·0	71·5	55·0	31·5
·024	29·859	3·5	38 5	56·0	69·0	59·5	32·0
[illegible]	30 062	5·0	41·0	47·5	76·0	59·0	33·5
[illegible]	30·044	1 5	34·5	48·0	74·5	64·0	30·0
[illegible]	30·025	2 0	35·0	49·0	68·0	55·0	30·5
[illegible]	30·038	5·0	41·0	54·5	70·5	57·0	35·5
·044	30·037	9·5	49·5	51·5	67·0	55·0	40·0
·054	30·042	3·9	37·5	50·0	70·0	55·5	31·5
·047	29 857	1·0	36·0	51·5	70·5	55·0	32·0
[illegible]	30 012	2·0	35·5	45·0	52·5	52·0	31·5
1·172	30·205	3·0	38·0	43 0	62·0	50 0	32 0
·287	30·334	·5	31·0	46 0	65·5	52·0	30·0
·452	30·441	1·5	34·5	47·5	74·0	52·5	30 5
·481	30·404	1·0	31·5	42·5	71·0	50·0	27·0
·332	[illegible]	3·0	37·0	44·5	60·0	50·0	30·0
·016	[illegible]	5·0	41·0	55·0	74·5	54·5	31·0
·110	[illegible]	3·0	33·0	53·0	83·5	59·0	34·0
·222	[illegible]	5 5	41·5	52·0	69·5	58·0	32·5
[illegible]	[illegible]	8·0	47·0	43·5	65·0	52·5	34·0
·271	[illegible]	5·0	41·0	48·0	74·0	53·0	30·5
[illegible]	[illegible]	4·0	39·5	50·0	76·5	54·5	34·0
·272	[illegible]	6·5	43·5	54·5	84·0	59·0	34·5
·045	[illegible]	3·5	38·5	53·0	83·0	55·0	34·0
·772	29·911	6·0	43·0	56·0	76·0	67·0	32·0
[illegible]	[illegible]	6 0	42·0	50·0	70·5	58·0	33·5
·915	[illegible]	14·0	58·0	57·5	66·0	50·0	31·0
·785	[illegible]	13·0	55·5	57·0	67·5	51·5	30·5
[illegible]	[illegible]	12·0	55·5	53·5	72·0	55·0	32·5
·110	[illegible]	11·0	54·0	57·0	78·0	56·5	31·0
·945	30·110	12·5	54·5	54·0	65·0	58·0	32·5
Mean Press.		Mean	M'n Tem.		Mean	Mean	Mean
30·0?2		5·40	46·35		70·68	55·42	32·50
Greatest do.		Max.			Max.	Max.	Max.
31·172		14·00			84·00	67·00	42·0C
Least do.		Min.			Min.	Min.	Min
29·565		0·1			52·50	50·00	27·0(

Meteorological form brought into use at the b
differs in some respects from the former one.
adopted with the view of assimilating the Hoba
s more closely with those of stations in
ca, etc., in order to co-operate in a system
al Meteorology. Readings are added from th
thermometer, that being the instrument gener
continent of Europe.

mean is in all cases taken from the sums of
registers, not from the maximum and minimum
direction of the wind is registered from curr
of 92 feet above sea level, and its force in
foot.

relative quantity of rain that fell under the
is registered each morning at 7·30 a.m.

thirty-five years' standard tables are used for
fference from average.

FRANCIS ABBOTT, F.R.A.

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of leafing, flowering, and fruiting of a few
ants in the Botanical Gardens during the
ly, 1876:—

.—Arbutus unedo commencing to flower.

.—Garrya elliptica, ditto.

.—Almond, ditto; Yellow Crocus, ditto.

F. ABBOTT, JUN., Superint

METEOROLOGY FOR JULY, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52′ 13″ S. Longitude 9h. 49m. 20·29s E.

Registered for the Royal Society of Tasmania.

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a m	Bar. 4 30 p m	Thermometers Reading. Centigrade, 7·30 a m.	Fahrenheit, 7 30 a m.	Fahrenheit, 4 30 p m.	Thermometers Self Registering. Highest in Sun, 4 30 p m.	Highest in Shade, 4 30 p m.	Lowest on Grass, 7 30 a m.	Relative Humidity. Per cent. 7·30 a m	4·30 p m	Clouds. 7 30 a m Character	Amount.	Clouds. 4 30 p m Character.	Amount	Wind. 7 30 a m. Direction from.	Force in lbs. per square foot.	Wind. 4 30 p m Direction from.	Force in lbs. per square foot.	Rain in Inches 7·30 a m	Evap. 7 30 a m	Ozone. Chrom. Scale. 7·30 a m
1	29·716	29·738	8 5	47 5	49·5	70 0	55 0	42 0	79	79	K	4 0	KN	4 0	SW	·52	S	2 60			4 0
2	[illegible]	[illegible]	2 5	37·0	51·0	71 5	55 0	31·5	75	60	O	0	K	8 5	W	·0	NW	·0	·07		4 0
3	[illegible]	[illegible]	3 5	38 5	50·0	69·0	59 5	32 0	84	75	KS	8·0	KS	9 0	W	·56	NW	·26			5 5
4	[illegible]	[illegible]	5 0	41 0	47·5	76 0	59 0	33 5	85	86	K	3·0	K	6·5	NW	·0	S	·0	·01		4 0
5	[illegible]	[illegible]	1 5	34 5	48·0	74·5	64 0	30 0	100	73	O	0	K	3·0	SW	·26	N	·52	·04		5 5
6	[illegible]	[illegible]	2 0	35 0	40 0	68·0	55 0	30 5	91	74	KS	4·5	K	7·5	NW	·0	NW	·26			7 0
7	[illegible]	[illegible]	5·0	41 0	54 5	70 5	57 0	35·5	85	60	K	6 0	KS	6 0	NW	·0	W	·26			4 5
8	[illegible]	[illegible]	9 5	49 5	51·5	67·0	55·0	40·0	68	69	K	10 0	KS	9·0	NW	2·60	NW	·26			5·0
9	[illegible]	[illegible]	3·0	37·5	50·0	70·0	55 5	31·5	84	86	KS	9·0	KS	10 0	NW	·52	NW	·0			6 5
10	[illegible]	[illegible]	1 0	38 0	51 5	70·5	55·0	32·0	83	80	KS	7·0	KS	7 0	W	·26	NW	·0		·55	4·0
11	[illegible]	[illegible]	2 0	35·5	45 0	52·5	52 0	31 5	91	100	KS	7 5	N	10 0	NW	·26	S	·26	1·10		3 5
12	30 172	30 205	3·0	38 0	43 0	62 0	50 0	32 0	84	84	KN	6 5	KN	4·5	S	·26	S	·0			6 5
13	[illegible]	[illegible]	[illegible]	[illegible]	40·0	[illegible]	[illegible]	[illegible]	[illegible]	93	K	2·0	KN	[illegible]	W	[illegible]	NW	·0	·03		7 0
14	[illegible]	[illegible]	1 5	34 5	[illegible]	71 0	[illegible]	[illegible]	[illegible]	93	O	0	O		NW	[illegible]	NW	·0			6 0
15	30 481	30 404	1 0	31·5	42 5	71·0	50 0	27·0	84	70	O	0	O	0	NW	·26	NW	·0			3 5
16	30 332	30 206	3 0	37·0	44 5	60 0	50 0	30 0	76	85	KS	5·0	K	7·0	NW	·26	NW	·26	·01		4 0
17	30 016	29 980	5 0	41 0	55 0	74·5	54 5	31·0	85	70	K	8 0	K	6·5	NW.	·0	NW	·26			4·5
18	30 119	30 144	3·0	38·0	58·0	83 5	50·0	34 0	76	74	KS	5·0	O	0	S	·26	N	·0			3 5
19	[illegible]	30 157	5 5	41 5	52 0	69 5	53 0	32 5	78	69	K	7 0	KS	6 5	NW	·0	N	·26		·11	4·0
20	29 753	29 904	8 0	47·0	43·5	65 0	52·5	34 0	86	71	K	8·5	N	5 5	NW	·0	SW	5·21			4 5
21	30·271	30 347	5 0	41·0	48 0	74 0	53 0	30·5	71	79	KN	7·0	KN	9·0	S	2·60	S	·26	·50		4 0
22	30 309	30·301	4 0	39·5	50·0	76 5	54 5	34 0	78	74	K	4 5	KS	7·5	NW	·26	W	·0	·03		7 0
23	30 272	30 162	6 5	43·5	54 5	84 0	59 0	34 5	79	75	O	0	K	7·0	NW	·26	NW	·0			5 5
24	[illegible]	[illegible]	7 5	38 5	53 0	83 0	[illegible]	34·0	92	50	K	4·5	KS	8 0	W	·52	W	·26			5 5
25	[illegible]	29 911	6 0	43 0	56 0	76 0	67 0	32 0	75	57	K	1 0	KN	10 0	W	·52	SW	[illegible]			1 0
26	30 104	29 995	6 0	42 0	50 0	70 5	58 0	33·5	84	80	KS	10·0	K	9 0	NW	·52	NW	·52	·01		2·5
27	[illegible]	[illegible]	[illegible]	[illegible]	57	[illegible]	[illegible]	[illegible]	[illegible]	81	N	10 0	N	10 0	S	·52	S	5·21	·02		5·5
28	[illegible]	[illegible]	13 0	[illegible]	57 0	67 5	51 5	33 5	[illegible]	96	N	10 0	KN	[illegible]	S	5·21	S	[illegible]	[illegible]		6 0
29	29 565	29 700	12·0	55 5	58 5	72 0	55 0	32 5	93	87	N	10·0	KN	10·0	SW	2 60	W	·52	·05		7 0
30	30 110	29·920	11·0	54·0	57·0	78 0	56 5	31·0	80	93	K	7·0	KS	3 0	SW	·52	NW	·26	·10		6 5
31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	N	[illegible]	SW	5 21	SW	2·60	·15	·25	3 5

Mean Press. 30·002	Mean 5 40	M'n Tem. 46·35	Mean 70·63	Mean 55 42	Mean 32·50	Mean. ·80	Mean for Month. 6 20	Mean Force, ·76.	Tl. 2 93	Tl. ·91	Tl. 15400
Greatest do. 31·172	Max. 14·00		Max. 84·00	Max 67·00	Max. 42 00		Prevailing Character. K & KS	Greatest Force, 5·21.			Mean 5·00
Least do. 29 505	Min. 0·1		Min. 62·50	Min 50·00	Min. 27 00			Least Force, 0			

T[illegible] M[illegible] [illegible] at the beginning of 18[illegible] [illegible] from the former ones. It has been adopted with the view of assimilating the Hobart Town [illegible] with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily readings, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a m.

The thirty five years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering, and fruiting of a few standard plants in the Botanical Gardens during the month of July, 1876:—

20th.—Arbutus unedo commencing to flower.
24th.—Garrya elliptica, ditto
31st.—Almond, ditto. Yellow Crocus, ditto.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for July, 1876, in accordance with new forms, and registered at 7 35 a m. and 4 35 p m.—

Barometer, mean of 2 daily readings, corrected and reduced, 30 097in.

Thermometer, mean of 2 ditto, 39 5[illegible]deg.; mean of max. and min. in shade, 41·53deg.

Dew point, mean of 2 daily readings, 36 60deg.

Elastic force of vapour mean, of 2 ditto, ·217.

Humidity mean of 2 ditto, ·88.

Solar intensity, mean of maximum temperature, 94·96deg.

Terrestrial radiation, mean of minimum temperature, 26 90deg.

Ozone, mean of 2 daily observations, 7·52.

Clouds, mean of 2 ditto, 5 37.

Rainfall, 1·64in.; in excess of evaporation, ·69in.

Evaporation, ·95in.

Wind, force in lbs. per square foot, total of 2 daily observations, 18·04lbs.

Horizontal movement, 1,150 miles.

Of 62 observations, 25 were calms, 8 rainy days.

On 13th the terrestrial radiation was 18deg.

The aerial movement was less by 620 miles than during any month in the last twelve.

W.E. SHOOBRIDGE, Valleyfield.

PRIVATE (

Latitude 42° 52′

Registered

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4·30 p.m.	Thermometers Reading. Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermomete[rs] Self-Registeri[ng] Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.
1	30·245	30·220	12·5	55·0	59·5	82·5	65·0
2	30·240	30·320	13·0	56·0	59·5	87·0	66·5
3	30·356	30·238	13·0	55·0	59·5	92·0	77·0
4	30·240	30·130	13·0	55·0	58·0	80·5	58·0
5	30·150	30·080	7·50	45·5	54·0	77·0	57·5
6	29·[illegible]	29·762	6·0	43·0	50·5	79·0	56·0
7	29·[illegible]	29·543	9·5	49·5	48·0	54·0	52·0
8	29·774	29·867	6·0	43·0	52·0	87·5	59·0
9	30·0[illegible]	29·982	4·0	40·0	55·5	88·5	60·0
10	30·148	3 ·187	7·0	45·0	50·0	60·0	4[illegible]·5
11	30·216	30·172	4·0	40·0	52·5	75·0	56·0
12	30·158	30·118	6·5	44·0	58·5	86·5	62·0
13	30·116	30·054	6·0	42·0	53·0	75·0	59·0
14	30·227	30·162	3·0	38·0	53·0	85·[illegible]	58·0
15	29·924	29·[illegible]	2·5	37·0	53·0	85·0	53·0
16	29·460	29·448	5·0	41·0	45·0	61·5	53·5
17	29·924	29·956	3·5	38·5	43·0	60·0	52·0
18	30·080	30·026	2·5	36·5	46·5	51·0	49·0
19	30·132	30·134	1·5	34·5	52·5	76·0	61·0
20	30·174	30·172	6·0	45·0	57·0	67·0	58·0
21	30·064	29·845	5·5	42·0	60·0	86·0	62·0
22	29·833	29·749	8·0	47·5	63·5	100·0	68·0
23	29·811	29·682	6·0	43·0	63·0	82·0	70·0
24	29·512	29·377	6·0	43·0	48·5	78·5	67·0
25	29·517	29·593	5·0	41·5	45·5	86·0	61·0
26	29·720	29·735	6·5	44·0	55·5	90·0	62·5
27	30·054	30·061	6·5	44·5	54·0	79·0	58·0
28	30·0[illegible]0	29·82[illegible]	4·0	40·0	56·0	65·5	59·0
29	29·620	29·567	7·5	45·5	54·0	90·0	65·0
30	29·753	29·771	10·0	50·0	58·5	72·5	60·0
31	29·742	29·401	12·5	55·0	65·0	90·5	68·0
	Mean Press. 29·930		Mean 6·76	M'n Tem. 49·46		Mean 78·79	Mea[n] 60·[illegible]
	Greatest do. 30·356		Max. 13·00			Max. 100·00	Ma[x.] 77·[illegible]
	Least do. 29·377		Min. 1·50			Min. 51·00	Mi[n.] 49·[illegible]

The Meteorological form brought into use a
1876 differs in some respects from the forr
een adopted with the view of assimilating t
ecords more closely with those of stati
merica, etc., in order to co-operate in a
ational Meteorology. Readings are added
rade thermometer, that being the instrumer
n the continent of Europe.
The mean is in all cases taken from the s
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The direction of the wind is registered fr
eight of 92 feet above sea level, and its
quare foot.
The relative quantity of rain that fell un
inds is registered each morning at 7·30 a.m
The thirty-five years' standard tables are u
e difference from average.

FRANCIS ABBOTT,

ime of leafing, flowering and fruiting of
plants in the Royal Society's Gardens
1876:—
18th. Sambucus niger commencing to bre
23rd. Horse chestnut ditto ditto.
24th. Gooseberries commencing to start.
30th. Common Elm commencing to flow
31st. Lombardy Poplar commencing to b

F. ABBOTT, JUN.,

METEOROLOGY FOR AUGUST, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52′ 13″ S ; Longitude 9h. 49m. 29·2s E

Registered for the Royal Society of Tasmania

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers (Self Registering) Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent 7·30 a.m.	4·30 p.m.	Clouds 7·30 a.m. Character.	Amount.	Clouds 4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon Evap. 7·30 a.m.	Ozone, Chrom. Scale. 7·30 a.m.
1	30 245	30·220	12 5	55 0	59·5	82 5	65 0	35 0	86	87	K	7·5	K	2 0	NW	·26	NW	·52	·02		4·5
2	30 240	30 320	13 0	56 0	59 5	87 0	66 5	33 5	93	93	KS	9·0	KS	6 0	W	0	W	0			4 0
3	30 355	30 238	13 0	55 0	59·5	92 0	77 0	33 0	100	87	S	3 0	KS	3 0	W	·26	SE	0			4 0
4	30 240	30 130	13 0	55 0	58 0	80 5	58 0	32 5	93	87	K	8 0	KN	10 0	NW	·52	NW	·0			3 5
5	30 150	30·080	7 50	45·5	54 0	77·0	57·5	33 0	93	86	KN	9·	K	8 5	W	·26	N	·0			5 0
6	29·898	29·762	6 0	43 0	50·5	79 0	55 0	37 0	92	86	K	10·0	KS	10 0	NW	·0	SE	·0			4·0
7	29·554	29 543	9 5	49 5	48·0	54 0	52·0	36 5	100	93	KN	10·0	N	10·0	S	2·60	S	2 60	·05		7·5
8	29 774	29 867	6 0	43·0	52·0	87 5	59 0	33·0	78	74	K	4·5	K	3·5	N	·0	W	·26	·11		7 0
9	30 090	29 982	4 0	40 0	55 5	85 5	60·0	29 0	76	65	K	7·0	K	7·0	N	·52	NW	2·60	·01		4·5
10	30·148	30·187	7·0	45·0	50 0	60·0	47·5	42·5	93	86	KN	9·0	KS	8·0	S	·0	W	·0	·09	·32	6·0
11	30 216	30 172	4 0	40 0	52·5	75 0	56 0	34 0	92	86	KN	8 5	K	4·5	NW	·52	NW	·52	·31		5 5
12	30·158	30·118	6 5	44 0	58 5	86 5	62 0	35 5	85	82	KS	7·0	K	7·5	W	·52	N	·0			6 5
13	30 116	30 054	6 0	42·0	53·0	75 0	59·0	34·0	84	80	K	3 0	KN	10 0	W	·52	S	·52	·02		3 5
14	30·227	30 162	3 0	35·0	53·0	85·0	58·0	31 5	84	74	K	0 0	O	0	W	·26	NW	·26	·01		4·0
15	29 924	29 680	2 5	37·0	53·0	85·0	54 0	31·0	83	64	K	2 0	K	3·0	NW	·52	W	5·21			4·0
16	29 460	29·448	5 0	41·0	45·0	61 5	53·5	32·0	78	73	N	10·0	KN	6·0	W	·52	N	·52	·08		5·5
17	29·924	29·956	3 5	38 5	43 0	60·0	52·0	30·5	84	78	KN	7 5	N	6·0	S	2 60	S	2·60	·40		6·5
18	30 080	30·026	2 5	36·5	46 5	51 0	49·0	28·5	100	86	N	10 0	KN	9·5	W	·52	W	·26	·61		7·0
19	30 132	30 134	1 5	34 5	52 5	76 0	61·0	27 5	90	80	K	5 0	K	5 0	S	·26	SE	·0	02		4 0
20	30 174	30 172	6 0	48·0	57·0	67 0	58 0	32 0	77	70	KS	8 5	KS	7 5	NW	·52	NW	·26		·79	5 0
21	30 064	29 845	5·5	42·0	60 0	86 0	62·0	30·5	84	54	KS	4 0	K	2·0	W	·26	NW	52			4·0
22	29 833	29 749	8 0	47 5	63 5	100 0	68 0	34 0	86	67	K	8 5	KS	5 0	NW	·26	N	·26			6 5
23	29·811	29·682	6·0	43·0	63 0	82·0	70·0	30·5	84	51	O	0	K	2·0	NW	·52	N	2 60			4·0
24	29 512	29 377	6 0	43 0	48 5	78 5	67 0	31 0	84	86	KS	8 0	N	10·0	NW	·52	N	2 60			3 5
25	29 517	29 595	5 0	41·5	45 5	86 0	61 0	32 0	85	67	K	7 0	KN	7 0	W	·26	S	2 60	08		5 0
26	29 720	29·735	6 5	44·0	55 5	90 0	62·5	31·5	66	75	K	7 5	KS	5·0	NW	·52	SW	·52	·01		4·0
27	30 004	30 061	6 5	44·5	54·0	79·0	58 0	31·5	78	70	K	8·0	K	6·0	NW	·52	S	2·60	·02		4·0
28	30 030	29 823	4·0	40 0	56·0	65·5	59 0	31·5	84	70	K	10·0	KN	9 0	W	·52	SW	·52			3·5
29	29 620	29 567	7·5	45 5	54·0	90·0	65 0	34 0	86	70	KN	7·0	K	4 0	NW	·0	W	·52	·03		4 0
30	29·753	29 771	10·0	50 0	58 5	72·5	60·0	35 5	68	66	K	10 0	K	7 5	SW	5·21	W	2·60	·06		3·5
31	29 742	29 401	12 5	55 0	65 0	90·5	68 0	37·0	65	45	KS	7 5	K	7 0	NE	5·21	W	5 21	01	1·31	4·0
	Mean Press 29·930		Mean 6 76	M'n Tem. 49·46		Mean 78·79	Mean 60 24	Mean 32·60	Mean. ·80		Mean for Month 6 67				Mean Force, ·99				Tl 1 94	Tl. 2 42	Tl. 147 50
	Greatest do. 30·356		Max. 13·00			Max. 100 00	Max. 77·00	Max. 42 50			Prevailing Character.				Greatest Force, 5·21.						Mean 4·76
	Least do. 29 377		Min. 1 50			Min. 51·00	Min. 49·00	Min 27 50			K, KN & KS				Least Force, 0·						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a m.

The thirty-five years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during August, 1876 :—

18th. Sambucus niger commencing to break into leaf.
23rd. Horse chestnut ditto ditto.
24th. Gooseberries commencing to start.
30th. Common Elm commencing to flower.
31st. Lombardy Poplar commencing to break into leaf.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for August, 1876, in accordance with new forms, and registered at 7 30 a.m. and 4 30 p.m. :—

Barometer, mean of 2 daily readings, corrected and reduced, 29 986in.

Thermometer, mean of 2 ditto, 44·24deg ; mean of max. and min. in shade, 46·00deg.

Dew point, mean position of 2 daily readings, 39·93deg.

Humidity mean of 2 ditto, ·83.

Elastic force of vapour mean, of 2 ditto, ·242.

Solar intensity, mean of maximum temperature, 106·38deg.,

Terrestrial radiation, mean of minimum temperature, 30 83deg.

Rainfall, 2 17in.

Evaporation, 2 45in. : in excess of rainfall, ·28in.

Clouds, mean of 2 ditto, 5·17.

Ozone, mean of 2 daily observations, 7 33.

Wind, force in lbs. per square foot, total of 2 daily observations, 37·25lbs.

Horizontal movement, 2,010 miles.

Electricity, 55 observations, 19 negative, 12 positive, 24 nil.

W. E. SHOOBRIDGE, Valleyfield.

METEOR

PRIVA

Latitude 4

(Regist

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermo (Self-Regi Highest in Sun, 4·30 p.m.	Highest in Shade,
1	29·462	29·468	5·0	41·0	45·0	71·5	6
2	29·725	29·773	4·0	40·0	45·0	62·0	5
3	29·820	29·821	10·0	50·5	56·5	78·0	6
4	29·862	29·857	11·5	53·0	58·0	72·5	6
5	30·078	30·074	6·5	44·0	54·0	71·5	6
6	30·062	29·802	7·0	45·0	66·5	84·0	6
7	29·890	29·857	11·5	53·5	60·0	91·5	6
8	29·600	29·460	10·0	50·5	60·0	91·5	6
9	29·764	29·992	5·5	42·5	47·0	64·0	6
10	30·228	30·228	7·5	46·5	51·5	90·0	5
11	30·219	30·068	4·0	39·5	55·5	75·0	6
12	29·861	29·702	6·0	43·0	55·5	82·5	6
13	29·503	29·280	8·5	47·5	53·0	75·0	5
14	29·052	28·931	9·0	48·5	51·5	65·0	5
15	28·902	29·038	10·0	50·0	54·0	72·5	[illegible]
16	29·115	29·235	6·5	44·0	49·0	81·0	[illegible]
17	29·705	29·704	8·5	47·5	55·0	85·5	[illegible]
18	29·818	29·754	9·5	49·5	63·0	82·0	[illegible]
19	29·724	29·781	16·0	61·0	70·0	91·0	[illegible]
20	29·742	29·548	11·0	52·0	68·0	89·0	[illegible]
21	29·438	29·495	9·5	50·0	50·0	72·5	[illegible]
22	29·654	29·851	8·5	47·5	55·0	75·0	
23	30·154	30·105	8·0	47·0	61·5	80·0	
24	30·100	29·854	8·5	47·5	66·0	88·5	
25	29·995	29·957	9·0	48·5	59·0	88·0	
26	29·900	29·829	9·5	49·0	62·0	101·0	
27	29·737	29·664	11·5	53·0	54·0	84·5	
28	29·853	29·922	8·0	46·5	58·0	80·0	
29	30·068	30·005	8·5	47·0	61·0	85·0	
30	30·000	29·960	8·0	47·0	61·5	88·5	
	Mean Press. 29·751		Mean 8·55	M'n. Tem. 52·30		Mean 80·60	
	Greatest do. 30·228		Max. 16·00			Max. 101·00	
	Least do. 28·902		Min. 4·00			Min. 62·00	

The Meteorological form brought into u
of 1876 differs in some respects from the
been adopted with the view of assimilati
records more closely with those of
America, etc., in order to co-operate in
national Meteorology. Readings are ad
grade thermometer, that being the instru
on the continent of Europe.

The mean is in all cases taken from t
daily registers, not from the maximum an

The direction of the wind is registered
height of 92 feet above sea level, and
square foot.

The relative quantity of rain that fell
winds is registered each morning at 7·30

FRANCIS ABBO

Time of leafing, flowering and fruiting
plants in the Royal Society's Garde
1876:—

20th. Oak commencing to break into le
21st. Moutan Peony commencing to fl
26th. Ash commencing to break into l
27th. Grape vines ditto.
30th. Horsechestnut commencing to fl
Acacia commencing to leaf.

F. ABBOTT, Jr

METEOROLOGY FOR SEPTEMBER, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52′ 13″ S ; Longitude 9h. 49m. 29 2s E

Registered for the Royal Society of Tasmania

Day of Month	Bar. corrected for instrumental error and to mean sea level, 7·30 a.m.	Bar., 4·30 p.m.	Thermometers (Reading): Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers Self Registering: Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity Per cent, 7·30 a.m.	Relative Humidity, 4·30 p.m.	Clouds 7·30 a.m.: Character.	Amount.	Clouds 4·30 p.m.: Character.	Amount.	Wind 7·30 a.m.: Direction from.	Force in lbs. per square foot	Wind 4·30 p.m.: Direction from.	Force in lbs per square foot	Rain in Inches, 7·30 a.m.	Spon. Evap., 7·30 a.m.	Ozone, Chrom Scale, 7·30 a.m.
1	29·462	29·468	6·0	41·0	45·0	71·5	68·0	34·5	85	85	KN	10·0	KN	8·0	SW	2·60	W	2·60	·38		7·0
2	29·725	29·773	4·0	40·0	45·0	62·0	58·5	33·0	92	92	KN	6·5	N	7·5	N	2·60	W	2·60	·47		5·5
3	29·820	29·821	10·0	50·5	50·5	78·0	62·0	37·0	74	70	K	7·0	KS	8·0	W	·52	W	·52	·08		5·0
4	29·802	29·857	11·5	53·0	58·0	72·5	64·0	37·5	65	71	K	4·0	K	5·0	NW	·52	W	2·60	·02		3·5
5	30·078	30·074	6·5	44·0	54·0	71·5	61·0	36·0	79	74	K	3·5	K	7·0	N	·0	SE	·52			3·0
6	30·062	29·802	7·0	45·0	66·5	84·0	68·0	36·5	79	68	K	9·0	KS	6·5	N	·26	W	·52			4·0
7	29·800	29·857	11·5	53·5	60·0	91·5	66·5	37·0	64	62	KS	7·5	K	7·0	N	2·60	NW	·52			3·5
8	29·600	29·460	10·0	50·5	60·0	91·5	65·5	37·5	64	66	K	7·5	KS	6·0	N	·52	W	5·21			2·5
9	29·764	29·992	5·5	42·5	47·0	64·0	60·0	33·0	84	79	KN	10·0	KN	6·5	S	·26	S	·52	·15		7·0
10	30·228	30·228	7·5	46·5	51·5	90·0	58·0	34·5	67	71	K	6·0	K	3·5	S	·26	SE	·52	·03	1·00	6·5
11	30·219	30·008	4·0	39·5	55·5	75·0	62·0	32·0	78	76	O	·0	O	·0	W	·52	S	·52			7·0
12	[illegible]	29·702	6·0	47·0	55·5	82·5	64·5	33·5	84	61	K	8·5	KS	10·0	W	·26	S	·26			5·0
13	29·503	29·280	8·5	47·5	53·0	75·0	58·0	35·0	86	80	K	7·5	KN	10·0	N	·0	N	·0	·01		6·0
14	[illegible]	[illegible]	9·0	48·5	51·5	65·0	54·0	35·5	80	86	KS	7·0	KN	10·0	NE	·0	W	·26	·14		4·5
15	[illegible]	[illegible]	10·0	50·0	54·0	72·5	60·0	36·0	89	75	KN	8·0	KN	5·5	NW	[illegible]	W	2·60	·10		5·0
16	29·115	29·235	6·5	44·0	49·0	81·0	59·5	33·5	79	86	K	6·0	N	10·0	W	·26	SE	·52	·06		7·0
17	29·705	29·704	8·5	47·5	55·0	85·5	62·0	34·0	63	75	K	7·5	K	7·0	NW	·26	W	·26	·11		5·5
18	29·818	29·754	9·5	49·5	63·0	82·0	66·0	40·0	74	55	KS	9·0	KS	7·5	W	·0	W	2·60	·01		4·0
19	29·724	29·781	16·0	61·0	70·0	91·0	76·0	42·5	50	52	O	·0	K	1·0	W	2·60	W	·52			5·0
20	29·742	29·548	11·0	52·0	68·0	89·0	70·0	37·0	74	60	K	5·5	KN	7·0	W	·26	W	2·60		·58	3·5
21	29·438	29·495	9·5	50·0	50·0	72·5	67·0	42·0	93	93	N	10·0	N	10·0	W	·0	W	·26	·14		6·0
22	29·654	29·851	8·5	47·5	55·0	75·0	63·0	40·0	73	65	K	4·0	KN	8·0	NW	·26	SW	·52	·43		6·5
23	30·154	30·105	8·0	47·0	61·5	80·0	68·0	39·5	73	67	K	4·0	K	3·5	N	·52	S	·52	01		4·0
24	30·100	29·854	8·5	47·5	66·0	88·5	68·5	37·0	79	56	KS	9·0	K	3·5	N	·26	W	·52			4·5
25	29·995	29·957	9·0	48·5	59·0	88·0	66·0	37·5	68	61	K	3·0	K	3·0	N	·26	W	·26			3·5
26	29·900	29·829	9·5	49·0	62·0	101·0	68·5	38·0	79	58	KS	10·0	K	4·0	W	·52	NW	2·60			3·0
27	[illegible]	[illegible]	11·5	53·0	54·0	84·5	68·0	39·5	60	65	KS	4·5	K	5·5	NW	2·60	SW	2·60			5·5
28	[illegible]	[illegible]	8·0	46·5	58·0	80·0	61·5	36·0	73	57	KN	8·0	K	4·0	NW	·52	NW	2·60			4·0
29	[illegible]	[illegible]	8·5	47·0	61·0	85·0	64·0	37·5	67	62	K	1·0	K	7·0	NW	·26	W	52			7·0
30	[illegible]	[illegible]	8·0	47·0	61·5	88·5	66·0	37·0	67	58	KS	7·0	N	9·0	NW	·52	N	·0		1·14	4·5
Mean Pres.	[illegible]1		Mean 8·55	M'n Tem. 52·30		Mean 80·60	Mean 64·43	Mean 36·65	Mean ·72		Mean for Month. 6·35				Mean Force, ·92				Tl. 2·14	Tl. 2·81	Tl. 148·50
Greatest do.	[illegible]·228		Max. 16·00			Max. 101·00	Max. 76·00	Max. 42·50			Prevailing Character. K & KS				Greatest Force, 5·21.						Mean 4·95
Least do.	28·902		Min. 4·00			Min. 62·00	Min 54·00	Min. 32·00							Least Force, 0·						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc, in order to co-operate in a system of International Meteorology. Readings are added from the centi[illegible] thermometer, [illegible] generally used on the continent of Europe.

T[illegible] is in all cases taken from the sums of the two [illegible]

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different [illegible] registered each morning at 7·30 a.m.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during September, 1876:—

[illegible]th. Oak commencing to break into leaf

[illegible] Moutan Peony commencing to [illegible]

28th. Ash commencing to break into leaf

[illegible] Grape vines ditto

[illegible] Horse [illegible] commencing to flower. Robinia pseudo Acacia commencing to leaf.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for September, 1876, in accordance with new forms, and registered at 7·30 a.m. and 4·30 p.m.:—

Barometer, mean of 2 daily readings, corrected and reduced, 29·770in.

Thermometer, [illegible] ditto, [illegible] deg.; mean of max. and min. in shade, 50·45deg.

Dew point, mean [illegible] of 2 daily readings, [illegible] deg.

Humidity of air, mean of 2 ditto, ·71

Elastic force of vapour, mean of 2 ditto, ·262.

Solar intensity, mean of maximum temperature, 113·86deg.

Terrestrial radiation, mean of minimum temperature, 32·03deg.

Rainfall, 2·77in.

Evaporation, 5·16in.; in excess of rainfall, 2·39in.

Clouds, mean of 2 daily registers, 5·30.

Ozone, mean of 2 daily observations, 7·24

Wind [illegible] observations, 75·78lbs.

Horizontal movement, 3,925 miles.

[illegible]

W. E. SHOOBRIDGE, Valleyfield.

PRIVATE OBSE

Latitude 42° 52′ 13″ S

(Registered for th

Bar. corrected for instrumental error and to mean sea level.		Thermometers (Reading.)			Thermometers (Self-Registering.)		
7·30 a.m.	4·30 p.m.	Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.
30·048	30·074	8·5	48·0	54·5	90·0	62·0	36·0
30·118	29·947	7·5	46·0	67·0	90·5	69·0	33·5
29·830	29·805	12·0	54·0	61·5	92·5	73·0	36·0
29·790	29·588	11·0	52·0	70·5	100·7	79·5	34·5
29·940	29·925	9·5	49·5	55·5	88·0	72·0	33·0
29·980	29·606	11·0	52·0	62·0	75·0	63·0	38·5
29·807	29·909	9·5	49·5	56·0	70·0	65·0	36·0
30·140	30·193	9·5	49·5	56·5	92·5	61·5	34·0
30·194	30·082	5·5	42·5	53·5	73·0	58·0	32·5
29·970	29·970	10·5	51·0	56·5	61·5	59·0	37·0
29·929	29·925	12·5	55·0	64·5	90·0	68·5	38·5
29·929	29·963	12·0	54·0	53·0	65·5	65·0	37·0
30·090	30·082	10·5	51·0	51·0	62·0	60·0	34·5
30·194	30·132	9·0	49·0	52·0	58·5	58·0	33·0
30·142	30·092	10·5	51·0	52·0	57·0	55·5	36·5
29·904	29·771	12·0	54·0	59·0	72·5	63·0	43·5
29·680	29·583	12·5	55·0	64·5	96·0	75·0	44·0
29·704	29·742	11·0	52·0	60·5	90·0	68·0	41·0
29·828	29·756	7·5	46·0	68·5	104·5	73·0	33·5
29·439	29·448	12·0	54·0	59·0	76·0	68·0	36·0
29·548	29·386	8·0	47·0	61·0	78·5	68·0	34·0
29·445	29·464	11·5	53·0	63·5	79·0	68·0	38·5
29·383	29·336	9·5	49·5	63·0	90·0	64·5	36·5
29·498	29·668	8·0	47·0	59·0	83·5	62·0	35·0
29·795	29·752	9·0	49·0	65·0	96·0	68·0	37·5
30·007	30·198	9·5	49·5	56·5	72·5	64·0	38·5
30·082	29·987	12·5	55·0	66·0	93·0	76·0	42·0
29·929	29·786	13·0	56·0	72·0	94·0	75·0	43·0
29·675	29·509	12·5	55·0	61·5	92·5	73·5	50·0
29·446	29·537	7·5	66·0	57.5	72·5	67·0	42·
29·585	29·526	13·0	56·0	60·5	78·0	67·0	43·
Mean Press. 29·829		Mean 10·60	M'n. Tem. 55·50		Mean 85·00	Mean 66·74	Mea 37·
Greatest do. 30·198		Max. 13·00			Max. 104·50	Max. 79·50	Ma 50·
Least do. 29·336		Min. 5·50			Min. 61·50	Min. 58·00	Mi 32·

he Meteorological form brought into use at the
376 differs in some respects from the former on
a adopted with the view of assimilating the Hol
rds more closely with those of stations ir
erica, etc., in order to co-operate in a systen
onal Meteorology. Readings are added from
le thermometer, that being the instrument gene
he continent of Europe.
he mean is in all cases taken from the sums c
y registers, not from the maximum and minimu
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ht of 92 feet above sea level, and its force i
are foot.
he relative quantity of rain that fell under th
ds is registered each morning at 7·30 a.m.
he 35 years' standard tables are used for ob
erence from average.

FRANCIS ABBOTT, F.R.

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e of leafing, flowering and fruiting of a fe
plants in the Royal Society's Gardens durin
1876 :—

h. Carpinus betulus commencing to leaf.
th. Ailanthus glandulosus ditto.
lst. Tilia Europæa ditto.
th. Black Mulberry ditto.
th. Elm seeds commencing to shed.
th. Melia azederach commencing to leaf.

F. ABBOTT, JUN., Super

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52′ 13″ S.; Longitude 9h. 49m. 29.-2s. E.

(Registered for the Royal Society of Tasmania.)

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers (Self-Registering.) Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m. Character.	Amount.	Clouds. 4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon. Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	30·048	30·074	8·5	48·0	64·5	90·0	62·0	36·0	79	75	K	9·0	KN	7·0	NW	·26	SE	·26	·05		4·0
2	[illegible] 115	29·947	7·5	46·0	67·0	90·5	[illegible]	33·5	70	52	K	4·0	KS	5·0	W	·52	W	·26	·17		6·5
3	29·830	29·805	12·0	54·0	61·5	92·5	73·0	36·0	64	82	K	6·0	K	7·0	N	5·21	S	·26	·01		3·0
4	[illegible]	29·558	11·0	52·0	70·5	100·7	79·5	34·5	80	41	K	7·5	K	5·5	NW	·26	SW	20·83			5·5
5	[illegible]	29·925	9·5	49·5	55·5	88·0	72·0	33·0	68	75	KS	10·0	KS	9·0	NW	·26	SE	·26			3·0
6	29·980	29·606	11·0	52·0	62·0	75·0	63·0	38·5	80	82	K	10·0	K	8·5	W	·0	SE	·26			6·0
7	29·807	29·909	9·5	49·5	56·0	70·0	65·0	36·0	74	84	K	4·0	N	10·0	W	·26	S	·52	·34		3·5
8	30·140	30·193	9·5	49·5	56·5	92·5	61·5	34·0	74	70	K	5·0	O	·0	S	·26	S	·52			0·5
9	30·194	30·082	5·5	42·5	53·5	73·0	58·0	32·5	84	80	K	10·0	K	10·0	W	·26	NE	·26	·01		4·5
10	29·970	29·970	10·5	51·0	56·5	61·5	59·0	37·0	93	93	KN	10·0	KN	10·0	W	·0	W	·0		1·33	6·0
11	29·929	29·925	12·5	55·0	64·5	90·0	68·5	38·5	93	73	KN	10·0	K	1·5	W	·0	SE	·26	·11		6·0
12	29·929	29·963	12·0	54·0	53·0	65·5	65·0	37·0	93	93	N	10·0	N	10·0	S	·0	S	·52	·02		9·0
13	[illegible]	[illegible]	10·5	51·0	51·0	62·0	60·0	34·5	100	100	KN	10·0	KN	10·0	S	·52	S	·26	[illegible]		9·5
14	30·194	30·132	9·0	49·0	52·0	58·5	58·0	33·0	86	80	KN	10·0	KN	10·0	S	·0	SE	·0	·40		9·5
15	30·142	30·092	10·5	51·0	52·0	57·0	55·5	36·5	86	93	KN	10·0	KN	10·0	S	·26	S	·0	·06		8·0
16	[illegible]	29·771	12·0	54·0	59·0	72·5	63·0	43·5	93	94	KN	10·0	KN	10·0	S	·26	SE	0	·09		6·5
17	29·680	29·583	12·5	55·0	64·5	96·0	75·0	44·0	87	78	K	4·0	K	8·5	W	·26	E	·0	·05		5·5
18	29·704	29·742	11·0	52·0	60·5	90·0	68·0	41·0	74	66	K	4·0	KN	7·0	NW	·52	W	·52	·01		6·0
19	[illegible]	29·756	7·5	46·0	68·5	104·5	73·0	33·5	79	50	K	4·5	K	5·5	W	2·60	N	·52	·06		5·0
20	[illegible]	29·448	12·0	54·0	59·0	76·0	68·0	36·0	81	66	KS	10·0	K	4·5	NW	·26	S	·0	·01	·79	5·5
21	29·548	29·386	8·0	47·0	61·0	78·5	68·0	34·0	79	94	KS	7·0	K	7·0	NW	·26	NW	·26	·08		5·0
22	29·445	29·464	11·5	53·0	63·5	79·0	68·0	38·5	80	67	K	7·0	K	4·0	NW	·26	W	·52	·17		6·0
23	29·383	29·336	9·5	49·5	63·0	90·0	64·5	36·5	80	47	K	3·0	K	2·0	N	2·60	W	2·60	·18		7·0
24	29·498	29·668	8·0	47·0	59·0	83·5	62·0	35·0	67	66	K	3·0	K	4·5	NW	5·21	W	2·60	·07		6·0
25	29·795	29·752	9·0	49·0	65·0	96·0	68·0	37·5	74	55	KS	7·5	N	8·0	N	·0	W	2·60	·02		6·0
26	30·007	30·198	9·5	49·5	56·5	72·5	64·0	38·5	93	75	KN	10·0	K	9·5	SE	·26	SE	·26			5·5
27	30·082	29·987	12·5	55·0	66·0	93·0	76·0	42·0	75	64	KS	6·0	K	1·0	N	·52	S	·52			5·0
28	29·929	29·786	13·0	56·0	72·0	94·0	75·0	43·0	70	48	K	10·0	K	8·0	N	·52	NW	2·60			5·5
29	29·675	29·509	12·5	55·0	61·5	92·5	73·5	50·0	87	82	K	7·5	KN	9·0	NW	·0	N	·26	·25		7·0
30	29·446	29·537	7·5	66·0	57.5	72·5	67·0	42·5	79	61	KN	8·0	KN	9·0	N	5·21	S	5·21	·25		5·0
31	29·585	29·520	13·0	56·0	60·5	78·0	67·0	43·0	70	66	K	7·0	KN	8·5	NW	·52	W	·52	·03	1·85	4·5
	Mean Press. 29·829		Mean 10·60	M'n. Tem. 55·50		Mean 85·00	Mean 66·74	Mean 37·71	Mean. ·77		Mean for Month. 7·31				Mean Force, 1·15				Tl. 3·34	Tl. 3·97	Tl. 182·00
	Greatest do. 30·198		Max. 13·00			Max. 104·50	Max. 79·50	Max. 50·00			Prevailing Character. K & KN				Greatest Force, 20·83.						Mean 5·90
	Least do. 29·336		Min. 5·50			Min. 61·50	Min. 58·00	Min. 32·50							Least Force, 0·						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot

The relative quantity of rain that fell under the different winds is registered each morning at 7·30 a.m.

The 35 years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during October, 1876:—

7th. Carpinus betulus commencing to leaf.
16th. Ailanthus glandulosus ditto.
21st. Tilia Europæa ditto.
25th. Black Mulberry ditto.
26th. Elm seeds commencing to shed.
27th. Melia azederach commencing to leaf.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for October, 1876, in accordance with new forms, and registered at 7·30 a.m. and 4·30 p.m.:—

Barometer, mean of 2 daily readings, corrected and reduced 29·847in.

Thermometer, mean of 2 ditto, 54·79deg; mean of max. and min. in shade, 56·30deg.

Dew point, mean position of 2 daily readings, 47·80deg.

Elastic force of vapour mean of 2 ditto, ·341.

Humidity of air, mean of 2 ditto, ·78.

Solar intensity, mean of maximum temperature, 120·00deg.,

Terrestrial radiation, mean of minimum temperature, 40·83deg.

Rainfall, 2·16in.

Evaporation, 5·48in.: in excess of rainfall, 3·32in.

Clouds, mean of 2 daily registers, 6·03

Ozone, mean of 2 daily observations, 6·54.

Wind, force in lbs. per square foot, total of 2 daily observations, 59·69lbs.

Horizontal movement, 2,570 miles.

Electricity, 47 observations, 22 negative, 11 positive, 14 nil.

W. E. SHOOBRIDGE, Valleyfield.

Rainfall at Hill Station 1550ft. above sea level, 3·75in.

PRIVA

Latitude 42

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Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermo (Self-Reg Highest in Sun, 4·30 p.m.	Highest in Shade.
1	29·563	29·560	10·0	50·5	56·0	82·5	6
2	29·745	29·814	10·0	50·5	58·5	85·0	6
3	29·892	29·874	10·5	51·0	53·5	81·5	6
4	29·790	29·581	10·5	51·0	72·0	93·0	7
5	29·280	29·200	14·0	58·0	60·0	81·5	7
6	29·550	29·424	9·0	49·0	64·0	94·5	
7	29·433	29·220	12·5	54·5	58·0	72·0	
8	29·446	29·520	8·0	47·0	57·0	71·5	
9	29·238	29·166	12·5	54·5	57·0	78·0	
10	29·300	29·432	8·0	47·0	56·0	68·5	
11	29·740	29·639	10·0	50·0	57·0	76·0	
12	29·230	29·246	13·0	56·0	56·0	90·0	
13	29·438	29·556	11·5	53·0	62·5	88·5	
14	29·887	29·905	10·0	50·0	63·0	103·0	
15	29·851	29·880	15·5	60·0	72·0	102·5	
16	29·667	29·768	14·5	59·5	56·0	75·0	
17	30·088	30·007	10·5	51·0	61·5	90·0	
18	29·929	29·755	12·5	55·0	63·0	81·0	
19	29·522	29·309	14·5	59·0	62·5	68·0	
20	29·375	29·520	12·0	54·0	57·5	72·5	
21	29·635	29·545	11·5	52·0	55·0	68·0	
22	29·635	29·626	11·5	52·0	63·5	92·0	
23	29·658	29·742	10·0	50·0	57·0	82·5	
24	29·892	29·971	9·5	49·0	55·0	68·0	
25	30·092	30·084	10·0	50·0	55·5	66·5	
26	30·037	29·907	11·5	53·5	65·0	95·0	
27	29·882	29·789	13·0	56·0	73·5	100·0	
28	29·735	29·726	16·0	61·0	60·0	85·5	
29	30·084	30·127	11·5	53·0	62·5	90·0	
30	30·280	30·255	13·0	56·0	64.0	94·0	
	Mean Press. 29·635		Mean 11·32	M'n. Tem. 56·75		Mean 84·33	
	Greatest do. 30·280		Max. 16·00			Max. 103·00	
	Least do. 29·166		Min. 8·00			Min. 66·50	

The Meteorological form brought into of 1876 differs in some respects from the been adopted with the view of assimilat records more closely with those of America, etc., in order to co-operate i national Meteorology. Readings are a grade thermometer, that being the instr on the continent of Europe.

The mean is in all cases taken from daily registers, not from the maximum a

The direction of the wind is registere height of 92 feet above sea level, and square foot.

The relative quantity of rain that fe winds is registered each morning at 7·30

The 35 years' standard tables are u difference from average.

FRANCIS ABB

Time of leafing, flowering and fruiti plants in the Royal Society's Gard 1876 :—

16th. First ripe Strawberry gathered.
20th. First May Duke Cherry ditto.
25th. Black Mulberry in full flower.

METEOROLOGY FOR NOVEMBER, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 52′ 13″ S., Longitude 9h. 49m. 29·2s. E.

(Registered for the Royal Society of Tasmania.)

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	Bar. 4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometers (Self-Registering.) Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m. Character	Amount.	Clouds. 4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	Wind. 4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches 7·30 a.m.	Spon. Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	29·563	29·560	10·0	50·5	56·0	82·5	65·0	41·0	71	70	K	7·0	KN	10·0	N	·52	W	·26	·02		4·0
2	29·715	29·814	10·0	50·5	58·5	85·0	64·0	40·5	[illegible]	57	K	7·0	K	4·5	SW	2·60	S	2·60	·01		5·5
3	29·892	29·874	10·5	51·0	53·5	81·5	63·0	40·5	68	69	K	9·0	KS	9·0	S	·26	S	2·60	·01		5·0
4	29·790	29·581	10·5	51·0	72·0	93·0	74·0	40·5	74	48	KS	7·0	K	7·0	N	·26	N	5·21			5·0
5	29·250	29·200	14·0	55·0	60·0	81·5	73·0	44·5	61	71	K	6·0	KN	7·5	N	0	SW	0	·25		3·5
6	29·550	29·424	9·0	49·0	64·0	94·5	67·5	46·5	74	67	K	3·5	KN	8·0	N	·26	W	2·60	·01		5·5
7	29·433	29·220	12·5	54·5	58·0	72·0	64·0	45·0	70	70	KN	7·5	KN	7·0	W	·52	W	5·21	·45		3·5
8	29·446	29·520	8·0	47·0	57·0	71·5	60·0	41·5	86	65	KN	10·0	KN	6·0	W	5·21	SE	2·60	·10		7·0
9	29·238	29·166	12·5	54·5	57·0	78·0	63·0	50·0	70	65	KN	7·0	KN	6·0	N	·52	N	2·30	·23		5·0
10	29·300	29·432	8·0	47·0	56·0	68·5	50·5	45·0	86	70	KN	10·0	K	6·5	W	·0	N	·52	·02	2·03	5·0
11	29·740	29·634	10·0	50·0	57·0	76·0	65·0	40·0	80	76	K	6·0	KS	10·0	W	·26	E	·0	·08		4·0
12	29·250	29·246	13·0	56·0	56·0	90·0	70·0	42·5	65	93	K	3·5	KN	8·0	W	5·21	W	2·60	·14		4·5
13	29·433	29·356	11·5	53·0	62·5	88·5	68·5	40·0	60	67	K	7·0	K	8·0	NW	·26	W	2·60	·01		8·5
14	29·887	29·905	10·0	50·0	63·0	103·0	69·5	39·5	74	67	O	·0	K	10·0	N	·0	SE	·52			5·0
15	29·851	29·880	15·5	60·0	72·0	102·5	83·0	43·5	62	61	K	10·0	K	8·0	NW	·52	SE	·0	·15	1·16	4·0
16	29·667	29·768	14·5	59·5	53·0	75·0	71·0	47·0	100	93	N	10·0	KN	10·0	N	·0	W	·26	10		5·5
17	30·088	30·007	10·5	51·0	61·5	90·0	69·5	35·5	86	82	KN	10·0	K	6·0	S	·26	E	0	02		7·0
18	29·924	29·755	12·5	55·0	63·0	81·0	66·0	40·0	87	77	KS	10·0	KN	10·0	NW	0	N	0	55		5·0
19	29·522	29·319	14·5	59·0	62·5	68·0	65·0	43·5	76	94	K	8·0	KN	10·0	N	0	E	0	24		6·5
20	29·375	29·590	12·0	54·0	57·5	72·5	64·0	40·0	93	81	KN	7·5	K	7·0	SW	2·60	E	0	29		6·5
21	29·635	29·545	11·5	52·0	55·0	68·0	60·0	45·0	86	93	KN	9·0	KN	10·0	N	·26	W	·0	·12		6·5
22	29·635	29·626	11·5	52·0	63·5	92·0	69·0	44·0	74	63	K	5·0	K	7·0	N	·52	N	2·60	·12		6·0
23	29·658	29·742	10·0	50·0	57·0	82·5	65·0	45·5	80	76	K	7·5	KN	9·0	W	·0	S	·52	·02	·67	5·0
24	29·802	29·971	9·5	49·0	55·0	68·0	62·5	40·0	93	81	KN	10·0	K	7·0	S	·26	SE	·52			7·5
25	30·092	30·084	10·0	50·0	55·5	66·5	62·0	40·5	74	75	KN	10·0	KN	10·0	SW	·52	SE	·52			4·5
26	30·037	29·907	11·5	63·5	65·0	95·0	69·0	43·5	74	68	K	9·0	O	·0	W	·0	SE	·26			3·0
27	29·882	29·789	13·0	56·0	73·5	100·0	78·0	43·0	75	62	KS	3·0	KS	3·3	NW	·26	S	·52	·07		4·0
28	29·735	29·726	16·0	61·0	60·0	85·5	74·0	46·5	77	88	K	8·5	KN	10·0	N	·26	NW	·0	·12		3·0
29	30·084	30·127	11·5	53·0	62·5	90·0	69·0	42·0	64	67	K	5·0	K	5·0	W	·52	SE	·52			4·5
30	30·280	30·255	13·0	56·0	64.0	94·0	64·5	44·0	70	63	KS	10·0	K	1·0	W	·0	S	·52		1·21	3·5
	Mean Press. 29·685		Mean 11·32	M'n. Tem. 56·75		Mean 84·33	Mean 65·50	Mean 42·42	Mean. 74		Mean for Month. 7·38				Mean Force, ·96				Tl. 4·36	Tl. 5·07	Tl. 153·0
	Greatest do. 30·280		Max. 16·00			Max. 103·00	Max. 83·00	Max. 50·00			Prevailing Character. K & KN				Greatest Force, 5·21.						Mean 5·10
	Least do. 29·166		Min. 8·00			Min. 66·50	Min. 59·50	Min. 38·50							Least Force, 0·						

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7 30 a.m.

The 35 years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during November, 1876 :—

16th. First ripe Strawberry gathered.
20th. First May Duke Cherry ditto.
25th. Black Mulberry in full flower.
29th. *Punica plano* commencing to flower.
30th. First ripe Antwerp Raspberry gathered.
,, Bougainvillæa in full bloom.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for November, 1876, in accordance with new forms, and registered at 7 30 a.m. and 4 30 p m —

Barometer, mean of 2 daily readings, corrected and reduced, 29 706in.

Thermometer, mean of 2 ditto, 56·21deg.

Dew point, mean position of 2 daily readings, 48 30deg.

Elastic force of vapour mean of 2 ditto, ·342.

Humidity of air, mean of 2 ditto, ·76.

Solar intensity, mean of maximum temperature, 121·46deg.,

Terrestrial radiation, mean of minimum temperature, 40 50deg

Rainfall, 4 52in.

Evaporation, 5 66in. ; in excess of rainfall, 1·14in.

Clouds, mean of 2 daily registers, 5·61

Ozone, mean of 2 daily observations, 6 00.

Wind, force in lbs. per square foot, total of 2 daily observations, 85·67lbs.

Horizontal movement, 3,110 miles.

Electricity, 58 observations, 32 negative, 14 positive, 12 nil.

W. E. SHOOBRIDGE, Valleyfield.

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19m. 29.-2s.

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Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	
1	30·087	29·891	11·5	53·0	71·0	
2	29·766	29·817	11·0	52·0	58·5	1
3	29·890	29·762	11·0	52·0	63·0	
4	29·794	29·892	13·0	56·0	64·0	
5	29·921	29·899	14·0	58·0	64·0	
6	29·721	29·691	14·5	58·5	68·0	
7	29·774	29·733	13·0	56·0	69·0	1
8	29·520	29·493	15·0	59·5	67·0	
9	29·653	29·862	11·5	53·0	67·5	
10	29·907	29·855	17·5	64·0	77·0	1
11	29·612	29·615	16·5	62·5	72·0	1
12	29·874	29·852	14·0	58·0	63·5	
13	29·879	29·846	15·0	59·0	67·5	1
14	29·945	29·944	15·5	60·0	67·5	
15	29·815	29·528	15·5	60·0	76·0	1
16	29·752	29·886	15·5	60·0	69·0	1
17	29·972	30·049	14·0	57·5	67·0	1
18	30·138	30·101	14·0	58·0	62·5	
19	29·921	29·852	13·0	56·0	66·5	
20	29·848	29·795	15·5	60·0	77·0	11
21	29·763	29·641	15·0	59·5	69·0	10
22	29·683	29·768	11·5	53·0	57·5	9
23	29·882	29·810	12·5	55·0	67·0	10
24	29·860	29·742	17·5	63·5	81·0	12
25	29·606	29·541	18·5	65·5	65·0	12
26	29·364	29·110	16·5	62·5	66·0	11
27	29·263	29·357	10·0	50·0	61·0	7
28	29·441	29·622	9·5	49·5	59·0	9
29	30·042	30·115	11·0	52·0	59·0	8
30	30·134	30·127	11·0	52·5	65·0	9
31	30·076	29·932	14·5	59·0	78·0	11
	Mean Press. 29·773		Mean 13·80	M'n. Tem. 62·26		Me 10
	Greatest do. 30·138		Max. 18·50			M 12
	Least do. 29·110		Min. 9·58			M 78

) p.m. Amount.	7·30 Direction from.
6·0	NW
6·0	S
9·5	N
8·0	W
7·0	E
10·0	NW
5·5	NW
·0	W
7·5	W
1·5	W
5·0	W
0·0	N
4·0	W
4·0	E
9·0	W
5·5	N
3·5	W
6·0	NW
7·5	W
·0	W
·0	W
·5	W
·0	N
·0	NV
·5	N
·0	NE
·0	N
·5	N
·5	W
·0	N
0	N

The Meteorological form brought in
of 1876 differs in some respects from
been adopted with the view of assimil
records more closely with those of stati
etc., in order to co-operate in a s
Meteorology. Readings are added fr
mometer, that being the instrument
continent of Europe.

The mean is in all cases taken fro
daily registers, not from the maximum

The direction of the wind is registe
height of 92 feet above sea level, ar
square foot.

The relative quantity of rain that f
winds is registered each morning at 7·3

The 35 years' standard tables are
difference from average.

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Time of leafing, flowering and fruit
plants in the Royal Society's Gar
of December, 1876.

18th. First bunch red Currants ripe.

20th. First bunch black Currants rip

21st. Common Privet commencing t

" Juneating Apple commencing

METEOROLOGY FOR DECEMBER, 1876.

PRIVATE OBSERVATORY, HOBART TOWN.

Latitude 42° 25′ 13″ S.; Longitude 9h. 49m. 29.-2s. E.

(Registered for the Royal Society of Tasmania.)

Day of Month.	Bar. corrected for instrumental error and to mean sea level. 7·30 a.m.	4·30 p.m.	Thermometers (Reading.) Centigrade, 7·30 a.m.	Fahrenheit, 7·30 a.m.	Fahrenheit, 4·30 p.m.	Thermometer (Self Registering.) Highest in Sun, 4·30 p.m.	Highest in Shade, 4·30 p.m.	Lowest on Grass, 7·30 a.m.	Relative Humidity. Per cent 7·30 a.m.	4·30 p.m.	Clouds. 7·30 a.m. Character.	Amount.	4·30 p.m. Character.	Amount.	Wind. 7·30 a.m. Direction from.	Force in lbs. per square foot.	4·30 p.m. Direction from.	Force in lbs. per square foot.	Rain in Inches. 7·30 a.m.	Spon. Evap. 7·30 a.m.	Ozone. Chrom. Scale. 7·30 a.m.
1	30 087	29 891	11·5	53 0	71 0	98 5	75 5	40 0	71	65	K	5 0	KS	6 0	NW	·26	SW	2 60			6 0
2	29 766	29 817	11 0	52·0	58 5	100 0	72 0	40 5	69	66	K	8·0	K	6·0	S	5·21	SE	·52	·01		4·0
3	29 890	29 762	11 0	52 0	63 0	89 0	65 0	49 0	64	67	KN	7 5	K	9 5	N	·52	W	·52			4·5
4	29·794	29 802	13·0	56 0	64·0	84·5	71·5	47 5	75	59	K	7·0	K	8·0	W	·26	W	·52	·01		5·0
5	29 921	29 890	14 0	55 0	64 0	98 0	76 0	48 0	71	77	K	7 5	K	7 0	E	0	SE	·52	·01		6·5
6	29 721	29 691	14 5	55 5	65 0	95 5	79 0	45 0	88	64	KS	7 0	K	10 0	NW	·26	SE	0			4 0
7	29 774	29 733	13·0	56 0	69 0	106·0	76·5	43·5	65	64	CK	5·0	K	5·5	NW	·26	S	·52			4 5
8	29 520	29 493	15 0	59 5	67 0	93 5	78 0	44 5	67	48	K	7 5	0	·0	W	2 60	W	5·21			3·0
9	29 653	29 862	11 5	53 0	67 5	96 0	72 0	31 0	64	52	K	7 0	KS	7 5	W	2 60	N	2 60	·03		4 0
10	29 907	29 855	17·5	64 0	77 0	108 5	84·0	46 5	73	63	K	4 5	K	1·5	W	2 60	S	·52		1·65	2 5
11	29 612	29 615	16·5	62·5	72·0	110·0	86·0	44·0	77	73	K	9·0	K	5·0	W	·26	SE	·52			4 5
12	29 874	29 852	14 0	58 0	63 5	98 5	72 5	41 5	71	67	K	6 0	K	10 0	N	·26	SE	·52			3·0
13	29 879	29 846	15 0	59 0	67 5	100 5	79 0	43 0	82	64	K	3 0	K	4 0	W	·26	S	·52			2 5
14	29 945	29·944	15·5	60·0	67·5	96 0	72 5	45 0	77	64	K	10·0	K	4·0	E	·52	E	·52			4 0
15	29 815	29 528	15 5	60 0	76 0	112 5	79 0	50 0	82	63	K	8 5	K	9·0	W	·26	SE	·26			3·0
16	29·752	29 886	15 5	60 0	69 0	113·0	79 5	50 0	58	52	K	3·0	K	5·5	N	·52	W	5·21			4 5
17	29·972	30 049	14 0	57·5	67 0	104 0	72 0	48·5	68	62	K	6 0	K	3·5	W	·26	W	·52			2 5
18	30 138	30 101	14·0	58·0	62·5	98 5	77·0	48 0	71	72	K	2 0	K	6 0	NW	·26	S	2 60	·01		3·0
19	29 921	29 852	13·0	56 0	66·5	90·0	78 0	45·5	87	60	KS	10 0	K	7·5	W	·52	E	·52		2·0	4 5
20	29·848	29 795	15·5	60 0	77 0	113 0	81·0	46 0	71	40	K	2 0	K	6·0	W	2 60	W	5 21			5·0
21	29·763	29 641	15·0	59 5	69 0	109 5	78·0	45 0	62	49	K	4·0	K	7·0	W	2·60	W	2·60			3 5
22	29 683	29 708	11 5	53 0	57 5	95 5	69 0	42 0	69	75	K	7 5	KN	8 5	W	2 60	SW	5·21			4·5
23	29 882	29 810	12 5	55 0	67 0	100 0	70 0	42 5	65	56	K	8 0	KS	9 0	N	·0	W	·52	·01		3 5
24	29 860	29 742	17 5	64 5	81 0	123 0	89 5	46 0	47	50	K	6 0	K	5 0	NW	2 60	SE	·52			4 0
25	29 606	29 541	18 5	65 5	65 0	121 5	89 0	47 5	60	78	K	5 0	K	4 5	N	·26	SE	·26			4 0
26	29 364	29 110	16 5	62 5	66 0	110 0	77 5	43 0	82	100	K	10 0	N	10 0	NE	0	E	0	·02		3 5
27	29 263	29 357	10 0	50 0	61 0	78 5	68 0	38 0	69	62	K	5 5	KN	8 0	N	·52	W	·52	1 31		5 0
28	29 441	29 622	9 5	49 5	50 0	90 5	60 0	36 5	80	57	KN	8 5	K	4 5	N	0	SW	2 60	·07		6 0
29	30 042	30 115	11 0	52 0	59 0	86 5	65 5	38 0	64	66	K	5 0	K	6 5	W	·52	S	·52	·08		4 5
30	30 134	30 127	11 0	52 5	65 0	92 0	72 0	38 0	80	72	KS	7 0	0	·0	NW	0	S	2 60			4 5
31	30 076	29 932	14 5	59 0	78 0	110 5	79 0	40 5	71	56	0	0	0	0	NW	·26	S	·26		·74	3 0

Mean Press 29 773	Mean 13 80	Mn Tem 62 26	Mean 101 08 · Mean 75 60 · Mean 43 76	Mean 67	Mean for Month. 6 07	Mean Force 1 22 lbs · Tl. 1 56 · Tl. 4 93 · Tl. 126 50
Greatest do 30 138	Max 18 50		Max 123 00 · Max 89 50 · Max 50 00		Prevailing Character, K	Greatest Force 5 21 lbs · Mean 4 08
Least do. 29·110	Min. 9·58		Min. 78·50 · Min. 60 00 · Min. 36·50			Least Force. ·0

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the sums of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7·30 a.m.

The 35 years' standard tables are used for obtaining the difference from average.

FRANCIS ABBOTT, F.R.A.S., etc.

Time of leafing, flowering and fruiting of a few standard plants in the Royal Society's Gardens during the month of December, 1876.

18th. First bunch red Currants ripe.
20th. First bunch black Currants ripe.
21st. Common Privet commencing to flower.
,, Juneating Apple commencing to ripen.
25th. Doyenne d'Ete Pear commencing to ripen.
,, *Melia azederach* commencing to flower.

F. ABBOTT, JUN., Superintendent.

Results of observations taken at New Norfolk for December, 1876, in accordance with new forms, at 7·30 a.m., and 4·30 p.m.:—

Barometer, mean of two daily readings, corrected and reduced, 29 817 inches.
Thermometer, mean of two ditto, 62·61 deg.
Ditto, mean of maximum in shade, 64 17 deg.
Dew point, mean position of two daily readings, 50·90 deg.
Elastic force of vapour, mean of two ditto, ·375.
Humidity, mean of two ditto, ·68.
Terrestrial radiation, mean of minimum temperature, 43·03 deg.
Solar intensity, mean of maximum temperature, 131·06 deg.
Rainfall, 2 05 inches.
Evaporation, 8·13 inches; in excess of rainfall, 6·08 inches.
Clouds, mean amount of two daily registers, 4·88.
Ozone, mean of two ditto, 6 46.
Wind, force in lbs. per square foot, total of two ditto, 102 33 lbs.
Ditto, horizontal movement, 3,625 miles.
Electricity, 52 observations, 20 negative, 25 positive, 7 nil.

W. E. SHOOBRIDGE, Valleyfield.

METEOROLOGICAL OBSERVATIONS.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. P.M., simultaneously with Registration made at 7h. 35m. A.M., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9 h. 49 m. 29·2 s. E.

(Registered for the Royal Society, Tasmania.)

1876 June.	Barometer corrected for Index Error and to Mean Sea Level.	Thermometers: Fahrenheit.	Thermometers: Centigrade.	Relative Humidity.	Wind: Direction from	Wind: Force in lbs. per square foot.	Cloud: Amount.	Cloud: Character.	Rain in 24 hours.	Weather.
				%					In.	
1	29·656	56·0	15·0	93	NW	2·60	7·0	K		Light wind and rain
2	29·910	56·0	15·0	86	NW	·25	6·0	K	·03	Fine and moonlight
3	29·830	60·0	15·5	76	NW	·25	9·0	K		Vapory K
4	30·050	58·0	14·0	81	SW	·0	3·5	K		Calm, with moonlight
5	30·050	59·0	14·0	81	SW	·0	·0	·0		Calm & clear
6	29·940	57·0	14·0	86	NW	·0	7·0	K		Calm, with moon
7	30·040	59·0	15·0	87	SW	·26	9·0	K		Moon clouded
8	30·040	59·0	15·0	81	W	·26	7·0	KS	·03	Alternate moon & cloud
9	30·080	60·0	15·5	87	S	·0	3·0	K		Calm
10	29·855	50·0	14·0	82	NW	·26	10·0	KN		Hazy and cloudy
11	29·725	62·5	16·0	82	W	2·60	7·5	K	·02	a.m., cloudy; p.m., starry
12	29·445	64·0	18·0	67	SW	2·60	9·0	KN	·04	Squally WSW
13	28·940	62·5	17·5	67	SW	·0	10·0	N		Calm, with rain, after a heavy storm*
14	29·425	57·0	14·0	81	N	·0	10·0	N	1·73	Sky cloudy
15	29·240	58·0	14·0	80	W	·52	·0	·0	·02	Lightning and starlight

* During this storm the max. wind force was 26·04 lbs. per square foot, between 3h. and 5h. a.m.; the barometer reading 28·940.

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of Registration at Hobart Town, 10h. 33m. P.M., being after dark renders it impossible to make the Wind and Cloud records more than approximately correct. The Rainfall is measured at 7h. 30m. A.M. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 30TH JUNE, 1876.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

June.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					*In.*	
16	29·245	55·0	13·0	86	N	·0	·0	·0	·24	Calm and starlight
17	30·115	52·0	11·0	74	N	·0	5·0	K	·03	Stars & clouds
18	30·025	55·0	12·0	86	N	·0	7·0	K		Few stars (faint)
19	30·125	60·0	15·0	81	NW	·0	7 5	K		Alternate cld. and stars
20	30·020	58·0	14·0	81	NW	·26	10·0	N		Small rain
21	30·335	57·0	14·0	89	SW	·0	7·0	KN	·01	Calm, hazy, & cloudy
22	30·315	58·0	14 0	81	W	·0	7·5	KN	·02	Ditto
23	30·221	60·0	15·0	87	N	·25	7·5	KN	·03	Alternate cld., star, & rain
24	30·420	60 0	15·0	82	N	·26	3·0	K		Starlight, Southern light
25	30·500	57·0	14·0	87	W	·0	·0	·0	·01	Sky brilliant with stars
26	30·310	55·0	13 0	86	W	·0	6 0	KN		Stars faint, sky hazy
27	29·845	57·0	13·0	93	NW	·0	10·0	KN		Sky covered
28	29·917	55·0	12·0	86	NW	·26	5 0	K	·03	Moon & starlight
29	29·940	58·0	14·0	87	W	·0	2·0	K	·05	Ditto
30	29·720	57·5	14·0	75	N	·52	9·0	K		Large vapoury K

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 1ST TO THE 15TH JULY, 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In.	
1	29·320	55·0	13·0	80	N	·26	5·5	K		Moon & starlight
2	30·135	56·0	13·0	80	W	·0	7·0	K	·07	Ditto
3	29·945	59·0	15·0	82	NE	·26	7·5	KN	·01	Sky hazy, light rain
4	30·146	57·0	13·0	81	SW	·26	9·0	KN		Hazy, light rain
5	30·040	56·5	13·5	93	NW	·52	8·5	K	·01	Wind with large K
6	30·050	58·0	14·0	81	NW	·52	3·0	K	·04	Fine and moonlight
7	30·045	58·5	14·5	81	NW	·26	10·0	KN		Sky thick and hazy
8	31·130	58·0	14·0	87	NW	·26	8·0	KS		Faint moonlight
9	31·005	57·0	13·0	86	W	·0	5·0	K		Moonlight mottled K
10	29·905	57·0	13·0	80	NW	·26	9·0	S		Stratus cloud over and K
11	30·215	55·0	13·0	93	SW	·52	10·0	N	1·10	Rain for 12 hours
12	30·335	52·0	10·5	86	SW	·0	·0	·0	·03	Starlight, brilliant
13	30·520	55·0	13·0	86	NW	·0	10·0	KN		Cloudy, not star
14	30·610	54·5	12·5	86	SE	·0	·0	·0		Starlight, sky covered
15	30·435	53·0	12·0	86	N	·26	·0	·0		Ditto

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 31ST JULY, 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers.* *Fahrenheit.*	*Thermometers.* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In.	
16	30·235	55·0	12·5	86	SW	·0	7·0	KN		Cloudy, jotting of stars
17	29·980	59·0	14 5	87	NW	·26	10·0	KN	·01	Sky covered KN
18	30·235	58·0	14·0	81	N	·0	6 0	K		Cold & black, stars faint
19	30·030	60 0	15 0	81	N	·0	10 0	KN		Cloudy, sky covered
20	30 020	59·0	15·0	76	SW	2·60	10·0	N		Lightning, wind, & rain
21	30·430	58·0	14·0	81	S	·52	10·0	N	·50	Cloudy, sky covered
22	30 310	58·0	14·0	87	W	·0	7·0	N	·03	Few stars, faint
23	30·125	60·0	15·0	71	W	·0	·0	·0		Starlight
24	29·815	60 0	15·0	87	W	·26	7·5	K		Black and cold
25	29·915	60·0	15 5	87	SW	·0	10 0	KN		Calm and cloudy
26	30·032	60·5	15·5	87	NW	·0	10·0	KN		Sky covered
27	29·830	60 0	15 0	93	S	7·52	10·0	N	·02	Squally throughout
28	29·915	58·0	14·5	92	S	0·	5·0	K	·81	Few stars and moon
29	30·012	58·0	14·0	87	W	·52	·0	·0	·05	Moon & starlight
30	29·826	57·5	14·0	87	W	·52	6·0	KS	·10	Moon, star, and cloud
31	30·140	56·0	13·0	93	SW	·26	6·0	KN	·15	Stars & moon faint

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

From the 1st to the 15th August, 1876, inclusive.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers.* *Fahrenheit.*	*Thermometers.* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In.	
1	30·240	60·0	15·0	93	NW	·26	7·0	K	·02	Sky hazy, stars faint
2	30·330	59·5	15·0	93	SW	·0	10·0	K		Cloudy, sky covered
3	30·300	60·5	15·5	87	NW	·0	7·5	K		Sky hazy
4	30·130	61·0	16·0	87	NW	·0	10·0	K		Do do, moon faint
5	29·925	60·0	15·5	94	N	·0	8·0	K		Moonlight
6	29·618	61·0	16·0	82	S	·0	10·0	N		Sky covered, light rain
7	29·620	60·5	15·5	87	S	2·60	10·0	N	·05	Day squally throughout
8	30·012	57·0	14·0	86	W	·0	4·5	K	·11	Moon & starlight
9	29·915	61·5	16·5	93	N	·52	4·0	K	·01	Some dark K
10	30·245	59·5	15·0	81	W	·0	10·0	N	·09	Raining
11	30·120	59·5	14·5	93	W	·26	8·5	KN	·31	Cloudy and dark
12	30·045	60·5	16·0	94	NW	·52	·0	·0		Starlight, brilliant
13	30·135	60·0	15·5	87	N	·0	8·0	N	·02	Stars & clouds alternate
14	30·120	57·5	14·0	86	—	·0	10·0	N	·01	Cloudy, sky covered
15	29·545	59·5	15·0	81	N	·0	4·0	K		Starlight

Francis Abbott, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 31ST AUGUST, 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers*		*Relative Humidity.*	*Wind.*		*Cloud.*		*Rain in 24 hours.*	*Weather.*
		Fahrenheit.	*Centigrade.*		*Direction from*	*Force in lbs. per square foot.*	*Amount.*	*Character.*		
				%					In.	
16	29·542	55·0	13·0	100	—	·0	10·0	N	·08	Set rain
17	30·015	50·0	10·0	93	S	2·6	10·0	N	·40	Hail, rain and snow
18	30·030	54·0	12·0	86	W	·0	·0	·0	·61	Starlight
19	30·215	56·0	13·0	93	—	·0	4·0	K	·02	Starlight
20	30·105	57·0	15·0	87	—	·0	10·0	KN		Cloudy, sky covered
21	29·745	61·0	16·0	88	NW	·26	10·0	KN		Cloudy, sky covered
22	29·740	64·0	17·5	82	NW	·26	4·5	K		Alternate star and cloud
23	29·545	64·0	18·0	88	N	·0	0	O		Starlight, sky covered
24	29·330	63·0	17·0	87	W	·26	7·0	KN		Cloudy after rain
25	29·610	55·5	12·5	86	NW	·26	7·0	K	·08	Sky hazy, faint moonlight
26	29·835	58·0	14·0	87	N	·26	8·5	KN	·01	Heavy clouds and hazy
27	30·120	57·0	14·0	81	SW	·26	8·0	K	·02	Large K, a few stars
28	29·720	59·0	15·0	81	NW	·26	7·0	K		Moonlight through cloud
29	29·522	60·5	15·5	100	SW	2·6	5·5	N	·03	After rain
30	29·740	62·0	17·0	76	N	·52	10·0	KN	·06	Cloudy, sky covered
31	29·910	64·5	18·5	77	NE	5.21	10·0	N	·01	Squall, wind and rain

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 1ST TO THE 15TH SEPT., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers.* *Fahrenheit.*	*Thermometers.* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In.	
1	29·530	53·5	13·5	86	SW	2·60	10·0	N	·38	Cloudy, with rain
2	29·715	56·0	13·5	86	NW	2·60	10·0	N	·47	Cloud & rain continued
3	29·330	58·5	15·5	81	NW	2·60	6·5	K	·08	Moonlight
4	29·845	63·0	17·0	78	NW	·52	5·0	K	·02	Moon and starlight
5	30·120	61·0	16·0	76	NW	·26	4·5	K		Ditto ditto
6	29·815	64·0	17·5	82	W	·26	7·5	K		Halo round the moon
7	29·720	65·0	18·0	88	NW	·52	10·0	K		Dif. density, sky covered
8	29·525	63·0	17·0	77	SW	2·60	3·0	K		Starlight, brilliant
9	30·135	54·0	12·0	74	SW	2·6	7·0	K	·15	Stars faint
10	30·230	56·5	13·5	80	—	·0	·0	·0	·03	Starlight
11	29·940	58·5	14·5	87	S	·0	7·0	KN		Few stars, faint
12	29·540	62·0	16·5	87	S	·0	10·0	N	·01	Cloudy, not a star
13	29·015	63·5	17·5	88	N	·26	·0	·0	·14	Strong scintillation in the stars
14	28·725	63·0	17·0	94	—	·0	10·0	N	·10	Dark, calm, rain
15	29·000	61·0	16·0	87	W	·52	9·0	KN	·10	Squally, low bar.

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

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METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 30TH SEPT., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In.	
16	29·410	57·0	14·0	86	S	·26	8·0	N	·06	Showery
17	29·730	60·5	15·5	76	NW	·52	7·0	KN	·10	Few stars only
18	29·625	64·5	17·5	82	SW	5·21	7·5	KN	·01	Dark and windy
19	29·815	67·0	19·0	82	—	·0	·0	·0		Sky brilliant
20	29·500	67·0	19·0	82	N	·26	·0	·0		Starlight
21	29·435	63·0	17·0	86	—	·0	9·0	N	·14	Dark and cloudy
22	30·000	61·0	16·0	76	NW	·26	2·5	K	·43	Starlight
23	30·120	63·0	17·0	82	S	·0	·0	haze	·01	Sky hazy, stars faint
24	29·820	63·5	17·5	82	N	·52	9·0	K		Heavy cumela
25	29·910	62·0	16·5	76	N	2·60	7·0	K		Large bank K
26	29·730	63·5	17·5	76	W	·26	7·5	K		Ditto ditto
27	29·715	62·0	16·5	76	N	·52	7·0	K		Moonlight
28	30·015	61·0	16·0	81	W	·0	2·0	K		Moon and starlight
29	30·005	61·5	16·5	76	N	·26	4·5	K		Moonlight
30	29·930	61·5	16·5	82	N	·0	10·0	K		Cloudy, sky covered.

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 1ST TO THE 15TH OCT., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In	
1	30·125	62·5	17·0	88	—	·0	10·0	N	·05	p.m. and eve, rain
2	29·830	63·0	17·0	94	NW	·26	10·0	KN	·17	Cloudy and humid
3	29·840	64·0	17·5	82	S	·0	10·0	KN	·10	Ditto
4	29·620	65.0	18·0	82	SW	20·83	7·0	K		Wind, storm
5	29·920	62·0	16·5	100	N	·26	10·0	N		Dark, not a star
6	29·535	64·5	17·5	88	N	·26	3·0	K		Starlight
7	30·025	61·5	16·5	88	S	·26	10·0	N	·34	Rain, quite dark
8	30·210	58·0	14·0	87	SW	·26	·0	·0		Starlight, brilliant
9	30·010	59·0	15·0	82	—	·0	10·0	N		Cloudy, sky covered.
10	29·900	63·0	17·5	100	—	·0	10·0	KN		Ditto
11	29·840	66·0	18·5	94	—	·0	10·0	KN	·11	Ditto
12	30·015	61·0	16·0	100	S	5·21	10·0	KN	·02	Rain all day
13	30·135	59·5	15·5	93	S	·26	10·0	KN	·90	Ditto light rain
14	30·135	59·0	15·0	87	SE	·0	10·0	KN	·40	Cloudy, sky covered
15	30·010	59·0	15·0	93	S	·0	10·0	N	·06	Cloudy, with rain

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 31ST OCT., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers.* *Fahrenheit.*	*Thermometers.* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In	
16	29·640	63·5	17·5	94	—	·0	10·0	N	·09	Cloudy, sky covered.
17	29·524	67·0	19·5	88	W	·52	7·5	K	·05	Few stars only
18	29·810	64·0	17·5	77	W	·26	·0	·0	·01	Starlight, brilliant
19	29·515	66·5	19·0	82	N	·52	4·5	K	·06	Stars and clouds
20	29·505	63·5	17·5	77	NW	·0	·0	·0	·01	Starlight, brilliant
21	29·310	65·0	18·0	94	—	·0	10·0	N	08	Light rain
22	29·235	65·0	18·0	88	N	·52	1·0	K	·17	Moon and starlight
23	29·230	63·0	17·0	82	N	2·60	10·0	N	·18	Cloudy, sky covered
24	29·735	61·5	16·0	88	N	·52	6·0	KS	·07	Moon, stars and clouds
25	29·830	64·0	17·5	82	NW	·0	2·0	K	·02	Moon and starlight
26	30·110	63·0	17·0	88	S	·0	10·0	KN		Calm and cloudy
27	29·920	65·5	18·5	88	S	·0	10·0	K		Ditto
28	29·640	70·0	21·0	88	W	·0	10·0	KN		Drizzling rain
29	29·430	67·0	19·0	82	NW	·0	8·5	KN	·25	Sky hazy, moon and clouds
30	29·525	61·0	16·0	82	W	5·21	·8·0	KN	·25	Squally throughout
31	29·510	64·5	18·0	82	N	·52	10·0	N	·03	Squally, with rain

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 1ST TO THE 15TH NOV., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					*In*	
1	29·520	62·0	17·0	76	S	2·60	6.0	K	·02	Moonlight
2	29·820	60·5	15·5	81	S W	·0	10·0	KN	·10	Cloudy with rain
3	29·810	61·5	16·5	94	E	·0	10·0	N	·01	Cloudy, sky covered
4	29·433	68·0	20·0	78	N	·26	5·0	K		Stars faint
5	29·410	65·0	18·0	88	N	·26	4·0	K		Starlight
6	29 415	65·0	18·0	82	W	2·60	4·0	K	·25	Starlight
7	29·230	62·5	17·0	82	W	10·42	·0	·0	·01	Starlight, brilliant
8	29·435	61·5	16·5	88	N	2·60	10·0	KN	·45	Squally throughout
9	29·015	61·5	16·5	88	NW	5·21	·0	·0	·10	Starlight
10	29·535	61·0	16·0	87	N	·52	·3	K	·10	Ditto
11	29·240	62·0	17·0	88	NW	·0	·2	K	·02	Starlight
12	29·225	65·0	18·0	82	NW	·26	·0	·0	·08	Starlight brilliant
13	29·640	65 0	18·0	88	N	·26	·4	K	·14	Starlight
14	29·830	68·0	20·0	68	NW	·26	8·0	K	·01	Cloudy
15	29·610	72·0	22·0	73	—	·0	10·0	KN		Calm, dark and cloudy

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 30TH NOV., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In	
16	29·930	65·5	18·5	88	S	·52	·7	KN	·15	Rain all day
17	29·925	66·0	19·0	88	N	·0	·0	·0	1·0	Starlight brilliant
18	29·620	69·0	20·5	88	—	·0	10·0	N	.02	Calm, rain and cloud
19	29·145	69·0	20·5	94	—	·0	10·0	N	·12	Continued rain
20	29·545	65·5	18·5	94	—	·0	10·0	N	·88	Much rain
21	29·510	64·0	17·5	94	NW	·0	7·5	KN	·24	Sky hazy
22	29·555	65·0	18·0	88	N	·0	7·0	K	·29	Few stars faint
23	29·710	61·0	16·0	82	S	·26	10·0	KN	·12	Drizzling rain
24	30·030	59·5	15·0	81	W	·26	10·0	KN	·12	Dark massive clouds
25	30·040	61·5	16·0	87	S	·0	10·0	KN	·02	Sky hazy
26	29·840	64·5	18·0	82	S	·26	·0	·0	·0	Moon and starlight
27	29·735	70·5	21·5	88	SE	·0	10.0	KN	·0	Day fine, eve. cloudy
28	29·835	63·0	17·0	82	W	·52	4·0	K	.0	Moon and starlight
29	30·220	65·0	18·5	82	W	·0	·0	·0	·07	Ditto
30	30·140	66·0	19·0	82	S	·0	·0	·0	·0	Ditto

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

From the 1st to the 15th Dec., 1876, inclusive.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					*In*	
1	29·610	70·5	21·5	78	S	·0	10·0	K		Cloudy, sky covered
2	29·840	64·0	17·5	80	W	·0	6·0	K	·01	Moon and cloud
3	29·715	66·0	18·5	82	NW	·26	9·0	KN	·01	Sky cloudy
4	29·800	67·5	19·5	83	NW	·26	8·5	K	·01	Some dark K
5	29·810	69·5	20·5	88	S	·0	3·0	K	.01	Calm and starlight
	29·710	70·5	21·5	83	SE	·0	3·0	K	.0	Starlight
7	29·620	70·0	21·0	88	S	·0	·0	·0	·0	Do., brilliant
8	29·510	68·0	20·0	78	NW	2·60	3·5	K	·0	Starlight
9	29·825	67·0	19·5	82	W	2·60	8·0	K	·03	Dark K
10	29·640	74·0	23·0	79	S	·0	·0	·0	·0	Stars, brilliant
11	29·645	72·5	22·5	78	S	·52	2·0	K	·0	Starlight
12	29·820	69·0	20·5	83	—	·0	10·0	KN	.0	Cloudy, sky covered
13	29·835	70 0	21·0	83	S	·0	10·0	N	·0	Ditto, ditto
14	29·820	70·0	21·0	83	S	·0	·0	·0	·0	Calm and starlight
15	29·430	76·0	24·0	84	S	·0	·0	·0	·0	Ditto ditto

Francis Abbott, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

METEOROLOGICAL OBSERVATIONS.

FROM THE 16TH TO THE 31ST DEC., 1876, INCLUSIVE.

Recorded daily at Hobart Town, Tasmania, at 10h. 33m. p.m., simultaneously with registration made at 7h. 35m. a.m., at Washington, United States, in pursuance of a proposition of the late Vienna Congress, for a system of International Synchronous Observations.

Private Observatory, Hobart Town.

Lat. 42° 52′ 13″ S. Long. 9h. 49m. 29·2s. E.

(Registered for the Royal Society, Tasmania.)

Day of Month.	*Barometer corrected for Index Error and to Mean Sea Level.*	*Thermometers* *Fahrenheit.*	*Thermometers* *Centigrade.*	*Relative Humidity.*	*Wind.* *Direction from*	*Wind.* *Force in lbs. per square foot.*	*Cloud.* *Amount.*	*Cloud.* *Character.*	*Rain in 24 hours.*	*Weather.*
				%					In	
16	29·810	72·0	22·0	78	W	·26	7·0	N	·0	Stars & black clouds.
17	30·110	68·5	20·5	78	W	·26	6·0	K	·01	Cloud and stars
18	29·945	68·0	20·0	88	S	·52	·0	·0	·0	Starlight
19	29·810	67·0	19·5	94		·26	4·0	K	.0	Stars faint
20	29·720	72·0	22·0	83	NW	·52	4·0	K	.0	Stars and cloud
21	29·600	69·0	20·5	83	W	·52	3·5	K	·0	Starlight
22	29·820	64·0	18·0	88	W	·52	3·0	K	·0	Moon and starlight
23	29·820	68·0	20·0	88	NW	2·60	5.0	K	·01	Moon, stars and cloud
24	29·525	76·0	24·5	84	S	·26	·0	·0	·0	Moon and starlight
25	29·420	74·0	23·0	88	N	·26	8·0	K		Cloudy after thunder
26	29·015	69·5	20·5	94	—	·52	10·0	N	.01	Heavy rain
27	29·310	65·0	18·0	88	N	2·60	8·0	K	1·31	Dark K. clouds
28	29·800	60·0	15·5	93	NW	·26	6·5	KN	·07	Sky hazy
29	30·135	64·0	18·0	94	S	·0	10·0	KN	·08	Cloudy, sky covered
30	30·115	65·0	18·5	94	S	·0	7·0	K	·0	Sky hazy
31	29·730	72·0	22·0	83	S	·0	·0	·0	·0	Moon full and clear

FRANCIS ABBOTT, F.R.A.S., etc., Observer.

N.B.—The time of registration at Hobart Town, 10h. 33m. p.m., being after dark, renders it impossible to make the wind and cloud records more than approximately correct. The rainfall is measured at 7h. 30m. a.m. local time.

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT HOBART TOWN DURING 1876.

PRIVATE OBSERVATORY.

Latitude 42° 52' 13″ South. Longitude 9h. 49m. 29·2s East.

Height above Sea Level, 67 Feet.

Months.	Barometer: Mean of two daily Readings.	Thermometers (Reading): Centigrade Mean of one daily Readings.	Thermometers (Reading): Fah. Mean of two daily Readings.	Thermometers (Self-registering): Mean of Highest in Sun.	Thermometers (Self-registering): Mean of Highest in Shade.	Thermometers (Self-registering): Mean of Lowest on Grass.	Relative Humidity per cent. Men of two daily Observations.	Clouds (scale 0-10): Mean Amount for Month.	Clouds (scale 0-10): Prevailing Character.	Wind (lbs. per square foot): Prevailing Direction.	Wind (lbs. per square foot): Mean Force for Month.	Wind (lbs. per square foot): Max. Force.	Total Rain in inches. Amount.	Spontaneous Evaporation Total Amount.	Ozone. Chromatic Scale, Mean.
	In.										lbs.				
January	29·921	...	66·05	104·95	78·85	51·45	·74	6·00	...	SE	·34	2·60	·63	3·44	4·30
February	29·811	12·66	60·92	103·88	73·52	48·53	·73	6·21	K, KN	SE, S	1·02	10·42	·54	6·11	4·33
March	29·913	12·30	60·34	103·45	74·77	48·30	·75	6·31	K, KN	NW, S, SE	·42	5·21	1·21	3·46	4·68
April	29·816	8·65	52·23	88·66	65·08	42·12	·77	7·29	K, KN	W, NW, SW	·45	5·21	1·82	3·05	5·47
May	29·998	6·50	48·13	81·18	60·45	36·18	·82	6·09	K	NW, SW	·55	20·00	·83	1·24	4·87
June	29·868	6·00	46·89	71·23	56·65	35·63	·89	6·00	K, KN, KS	NW W	1·10	26·04	2·28	3·27	5·27
July	30·062	5·40	46·35	70·68	55·42	32·50	·80	6·20	K, KS	NW	·76	5·21	2·93	·91	5·00
August	29·930	6·76	49·46	78·79	60·24	32·60	·80	6·67	K, KN, KS	NW, W	·99	5·21	1·94	2·42	4·76
September	29·751	8·55	52·30	80·60	64·43	36·65	·72	6·35	K, KS	W	·92	5·21	2·14	2·81	4·95
October	29·829	10·60	55·50	85·00	66·74	37·71	·77	7·31	K, KN	S, W, NW	1·15	20·83	3·34	3·97	5·90
November	29·685	11·32	56·75	84·33	65·50	42·42	·74	7·38	K, KN	W	·96	5·21	4·36	5·07	5·10
December	29·773	13·80	62·26	101·06	75·69	43·76	·67	6·07	K	W	1·22	5·21	1·56	4·93	4·03
Sum	358·357	102·54	657·18	1053·81	797·34	487·85	9·20	77·83			9·83		23·63	40·68	58·71
Mean for Year	29·863	*9·32	54·76	87·82	66·45	40·65	·77	6·49	K, KN	NW. W	·82		1·97	3·39	4·89

* Mean for 11 months.

The Meteorological form brought into use at the beginning of 1876 differs in some respects from the former one. It has been adopted with the view of assimilating the Hobart Town records more closely with those of stations in Europe, America, etc., in order to co-operate in a system of International Meteorology. Readings are added from the centigrade thermometer, that being the instrument generally used on the continent of Europe.

The mean is in all cases taken from the *sums* of the two daily registers, not from the maximum and minimum.

The direction of the wind is registered from currents at a height of 92 feet above the sea level, and its force in lbs. per square foot.

The relative quantity of rain that fell under the different winds is registered each morning at 7·30 a.m.

FRANCIS ABBOTT, F.R.A.S., &c.

MONTHLY MEANS OF OBSERVATIONS TAKEN AT NEW NORFOLK FOR 1876.

Latitude 42° 46′ 48″ South. Longitude 147° 4′ 45″ East.

Months.	Barometer.	Thermometer.					Humidity of Air.			Condensation.		Evaporation.	Ozone.	Clouds.	Winds.		
	At Temperature 32°.	Mean Temperature of two Daily Registers.	Mean Temperature of max. and min. in shade	Mean Diurnal Range.	Mean Solar Intensity.	Mean Terrestrial Radiation.	Dew Point Mean Position.	Humidity of Air per 1·0.	Elastic Force of Vapor per 1000.	Rain in inches.	No. of Days on which Rain fell.	Spontaneous Evaporation in inches.	Mean Daily Amount.	Mean Daily Amount.	Prevailing Direction.	Force in lbs. per square foot.	Horizontal Movement in Miles.
		°	°	°	°	°	°						0 to 10	0 to 10			
January	29·804	64·74	64·16	23·74	130·61	45·19	53·40	·66	·402	1·66	13	4·73	5·82	5·62	W. SE	79·27	2527
February	29·901	62·00	64·01	25·17	132·58	42·93	50·80	·67	·372	·53	6	6·74	6·15	4·34	W. SE	71·41	2715
March	29·953	60·35	61·75	27·03	128·83	42·22	51·60	·73	·384	·89	11	4·24	6·22	5·96	W. SE	46·57	2003
April	29·816	50·96	52·43	21·53	114·66	36·10	40·80	·68	·255	1·94	13	2·20	7·00	6·29	W. SW	39·28	1772
May	30·044	45·90	47·41	19·54	104·25	32·74	41·50	·86	·263	·82	5	1·26	6·77	5·75	W. NW	47·08	2012
June	29·897	44·21	45·68	16·01	97·83	32·23	39·66	·85	·245	2·39	14	2·29	7·89	5·65	W	42·85	2350
July	30·097	39·83	41·53	19·38	94·96	26·90	36·60	·88	·217	1·64	8	·95	7·82	5·37	W	18·04	1150
August	29·986	41·24	46·06	20·31	106·38	30·83	39·93	·83	·242	2·17	10	2·15	7·83	5·17	W	37·25	2010
September	29·776	49·31	50·45	20·50	113·86	32·03	41·42	·74	·262	2·77	16	5·16	7·24	5·30	W	75·78	3925
October	29·847	54·79	56·30	20·41	120·00	40·83	47·89	·78	·341	2·16	15	5·48	6·54	6·08	W. E	59·69	2570
November	29·706	56·21	56·21	20·63	121·46	40·50	48·30	·76	·342	4·52	19	5·66	6·00	5·61	W. SE	85·67	3110
December	29·817	62·61	64·17	25·12	131·06	43·03	50·90	·68	·375	2·05	7	8·13	6·46	4·88		192·33	3625
Sums	358·644	635·15	650·16	259·37	1396·48	445·53	542·71	9·12	3·700	23·54	137	49·29	81·75	65·93		805·82	29769
Mean for 1876...	29·887	52·92	54·18	21·61	110·37	37·12	45·22	·76	·308	1·96	11·41	4·10	6·81	5·49	W	67·15	2480
Mean for 1875..	29·863	54·62	53·65	21·33	116·84	37·69	45·99	·75	·320	2·34	14·41	4·03	7·31	5·56	W SE	73·53	
Mean for 1874...	29·912	54·90	54·33	18·47	115·50	40·67	49·31	·83	·362	1·75	11·30	3·55	7·77	5·95	W SE	†83·80	

* Mean of 3 months. † Mean of 6 months. Total Rainfall for 1875, 28·17in.; for 1874, 23·04in.

W. E. SHOOBRIDGE.

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA,

FOR THE YEAR

1876.

TASMANIA:

PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.

1877.

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Westbrook, G. C....	Hobart Town
Young, Russell, M.H.A.	,,

Obituary.

BEDFORD, EDWARD SAMUEL PICKARD, F.R.C.S., England. Born in London, 1808 ; died at Sydney, 24th February, 1876. Mr. Bedford was one of the founders of the Tasmanian Society, the parent of the present Royal Society. He contributed several papers to its Proceedings, and always took the liveliest interest in its progress. All local institutions indeed, having for their scope moral and intellectual progress, found in him a warm and zealous advocate. Having passed the most active period of his life in the practice of his profession in this city, he proceeded in 1863 to Sydney where for some years past, in addition to his private practice, he acted as Medical Adviser to the Government of New South Wales, and was one of the Examiners in Medicine at the Sydney University. He was the first Tasmanian medical student who proceeded to England for professional education.

BROUGHTON, JOSEPH, Solicitor. Born in London, 1824 ; died at New Town, 26th November, 1876.

GRAVES, JOHN WOODCOCK, Barrister. Died at Hobart Town October 30th, 1876 ; æt. 47. Mr. Graves took much interest in the Society. The subject of acclimatisation especially engaging his attention.

IRVINE, PATRICK. Born in Edinburgh. Joined the Civil Service in India, in 1833, from which he retired as a Judge in 1862. Died at New Town, June 14th, 1876 ; æt. 62.

LEWIS, JOHN KENRICK, M.R.C.S., England. Born in Wales, 1819 ; emigrated in 1860, and after a residence of a few years in Victoria was appointed in 1866 as a Medical Officer at Port Arthur. Subsequently practised in Hobart Town, where he died October 26th, 1876 ; æt. 56.

MORRISON, ASKIN. Born in Ireland. For many years a leading merchant in this city, and a Fellow of the Society for upwards of 30 years. Died May 29th, 1876 ; æt. 76.

MINUTES of the ANNUAL GENERAL MEETING of the ROYAL SOCIETY OF TASMANIA, held at the Museum, Macquarie-street, at half-past 7 o'clock p.m., on the 30th January, 1877, the Right Rev. the Lord Bishop of Tasmania in the chair.

The advertisement by which the meeting had been convened having been read, the CHAIRMAN called upon the Secretary to read the Report.

The Report for 1876 was then read.

It was moved by Mr. ALLPORT, and seconded by the Rev. W. W. Spicer and carried :—" That the Report be adopted and printed for circulation amongst the Fellows."

The SECRETARY having reported that the retiring Members of Council were Messrs. F. Abbott, T. Giblin, Justin McC. Browne, and A. G. Webster, it was unanimously resolved, on the motion of Mr. SWAN, seconded by Mr. BILTON, that they should be re-elected.

Messrs. H. Cook and John Macfarlane were re-elected Auditors of Annual Accounts, on the motion of Mr. GRANT, seconded by the Rev. W.W. SPICER.

William Baynes, Esq., of Queensland, and the Rev. J. B. Richards, President of Horton College, were then, by ballot, elected Fellows of the Society.

Mr. BARNARD said that every succeeding year only served to increase the obligations the Society was under to their Hon. Secretary, Dr. Agnew, whose efforts had not slackened, and who had neglected no opportunity of advancing the Society's interests. They were all deeply indebted to Dr. Agnew for the way in which he fulfilled his self-imposed duties, and he would move—and he was sure all present would gladly concur with it—that the best and warmest thanks of the Meeting be given to that gentleman for his indefatigable exertions on behalf of the Society and in the cause of science. (Applause.)

The Rev. W. W. Spicer, in seconding the motion, said they ought to thank all whose labours benefited the Society, and few were more deserving of those thanks than Dr. Agnew.

The motion was carried with acclamation.

Dr. Agnew said he was deeply sensible of the kindness that had invariably been shown to him at these Annual Meetings; but he would be glad to pass on a great portion of the thanks so cordially given, to their excellent Curator, Mr. Roblin—(applause)—whose good, honest, faithful work was deserving of all praise. The number of Fellows kept up very well, and never since its foundation had the Society been in a more healthy and flourishing condition than at present. If the Government could only see fit to give them a little more assistance, a great deal more could be done both for the Museum and the Gardens. It must be remembered that the grant given by the Government to the Museum and Gardens was strictly confined to those institutions; the Royal Society did not receive a farthing. The Society was entirely self-supporting, and they did not require aid for themselves.

Some conversation then ensued on the subject of applying for an increased grant-in-aid, and ultimately it was resolved, on the motion of Mr. Dowdell, seconded by Mr. S. Scott, that Dr. Agnew, Mr. M. Allport, and the Rev. W. W. Spicer be appointed a sub-committee to wait upon the Colonial Secretary and point out the urgent claims of the Museum and the Gardens for increased support.

The Meeting then terminated.

REPORT.

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"The session of 1876 was opened on the 14th of March, but, owing to his absence from town, the inaugural address by His Excellency, as President, was not delivered until the subsequent meeting in April. The attendance of Fellows throughout the session has been larger probably than in any previous year, and papers of both local and general interest have been brought forward. Amongst these may be mentioned :—'An opening Address,' by His Excellency Frederick A. Weld, Esq., C.M.G. 'Notes on a new species of Nudibranchiata,' by the Rev. J. E. Tenison-Woods. F.G.S., F.R.G.S., etc. 'Contributions to the Phytograpy of Tasmania,' part 4, by Baron F. von Mueller, C.M.G., M.D., F.R.S., etc. 'On the Codlin Moth,' *(Carpocapsa pomonella)* by His Honor Mr. Justice Dobson. 'On some Tasmanian Patellidæ,' by the Rev. J. E. Tenison-Woods, 'History of Australian Geology,' by the same. 'Notes on the Tertiary Marine Deposits of Tasmania,' by Mr. R. M. Johnston. 'Notes on the Fossils referred to in the foregoing paper,' by the Rev. J. E. Tenison-Woods. 'On a new species of *Ampullaria*,' by the same. 'Reminiscences of a Visit to the Volcanoes of Hawaii,' by His Excellency F. A. Weld, Esq. 'On a new reversed Helix, *(Helix Weldii)* from the North West Coast of Tasmania,' by the Rev. J. E. Tenison-Woods. 'On the effects of wounds inflicted on the human subject by the spur of the Platypus,' by the Rev. W. W. Spicer, M. A., F.R.M.S. 'Synonomy of, and remarks upon, Tasmanian and other shells, with their Geographical distribution,' by John Brazier, C.M.Z.S.

" In reference to one prominent point in His Excellency's address—the conservation of a portion of Mount Wellington—it may be mentioned that owing to the exertion in Parliament of one of our Fellows, Mr. Russell Young, this great boon has been permanently secured to the public. Those papers which have not yet been published are now in the printer's hands and will appear in the transactions of the year. We have to regret the absence from the Colony of one of our most valued contributors, the Rev. J. E. Tenison-Woods, but we hope to receive some communications from him during the ensuing year."

" In addition to the papers previously noticed, communications on the following subjects have been read and brought under discussion, viz. :—
' Soundings taken by H.M.S. Challenger between Australia and New Zealand,' from Mr. Audley Coote. ' On the roaring heard in the neighbourhood of the Western Mountains,' from Rev. E. P. Adams. ' On the high temperature experienced in some silver mines in America,' from Mr. A. Coote. ' Notes on Mr. A. T. Newton's microscopical examination of Tasmanite, the so called Dysodile of the Mersey,' from T. Stephens, Esq., F.G.S. ' On the Language of the Aborigines of Tasmania,' from Mr. Calder. ' Notes on *Eucalyptus globulus*, showing the improbability of spurious seed being supplied from Tasmania,' from F. Abbott, jun. ' The geological age of the more recent basalts on the south side of Tasmania,' from M. Allport, Esq., F.L.S., F.Z.S. ' The destruction of trees and shrubs on Mount Wellington.' ' On the shaft lately sunk for coal at Spring Bay,' etc.

" We have, as usual, to thank Baron von Mueller for learned and elaborate papers.

" Many valuable additions, as will be seen by the printed list, have been made to the library.

As on former occasions, our most liberal contributor has been the American Government, to whom accordingly our warmest acknowledgments are due.

"The usual meteorological observations have been regularly carried on by Mr. Abbott and Mr. W. E. Shoobridge; and the monthly returns from the various lighthouses have been regularly received. In addition to these duties, Mr. Abbott has kindly undertaken to carry out the simultaneous daily meteorological observations which are now being made throughout almost all the scientific world. These special observations were commenced some months ago at the request of the United States Meteorological Department to which we transmit them regularly twice in each month. Meteorological abstracts for the quinquennial period 1870 to 1875 for Hobart Town have been carefully compiled with much labour by Mr. Roblin, and amalgamated with the existing 30 years' series. Mr. Roblin has also made abstracts, for the same period, of the returns from the lighthouse and other coast stations. All these are now in the hands of the Government printer.

"Our thanks are due to the Tasmanian Steam Navigation Company, Messrs. W. Crosby & Co., Macfarlane Bros., and Belbin & Dowdell for the transmission of various parcels to England and the neighbouring colonies. Thanks are also due to Messrs. Walch and Sons for the gratuitous distribution of the Society's publications to members residing in the country.

"During the year fifteen Fellows and four corresponding members have been elected; and there have been three resignations and six deaths.

"*Council.*—No vacancy has occurred during the year. The list of retiring members has been posted in the library for the last three days, in accordance with No. 32 of the amended rules of the Society.

"*Finance.*—The income from all sources was as follows:—Government Grant—in aid to the Museum, £200; ditto, Gardens, £400; Subscriptions, £188; from Marine Board £20; sale of plants, etc. at Gardens, £78 2s. 1d.: this with £30 12s. 0d., in the hands of the Superintendent of the Gardens, for the payment of wages, arrears of subscriptions, £30; and £3 in the hands of the collector, will give a total of £949 14s. 1d. The expenditure and liabilities as per balance sheet amounted to £993 14s. 1d., leaving a balance to debit of £43 10s.

"It will be noticed that the outlay for Printing, etc.,—£79 19s. 9d. has been very large, but none of this expenditure could be omitted, as we have been fortunate in the value of the papers contributed during the year; and the publication of such must always be regarded as a matter of necessity, being the great means whereby we are enabled to veep up friendly relations with learned bodies in karious parts of the world.

"The subscriptions generally have been more promptly forwarded than usual, we regret to say, however, that some members are still in arrears, although the usual notices have been duly forwarded to them.

"*Gardens.*—It is to be regretted that the new entrance has not yet been completed. The ground work has been for some time past in as forward a state as desirable, and but little remains to be done except the erection of suitable gates. For them the public are entirely dependent on the action of Parliament, and until provision is made for the necessary cost this much needed entrance must remain in its present unfinished and discreditable condition.

"The ordinary garden expenditure for the past year has exceeded the receipts by upwards of £40. Moreover, many pressing repairs for tools, implements, and buildings, which have involved increased and necessary outlay have been postponed for want of funds, and for the same reason a very fair petition from the labourers for a slight increase their pay (four shillings per diem) could not be complied with. It is only by the most rigid economy, accompanied by considerable difficulty, that the gardens have been kept in a fair state of order for some years past. All such institutions are necessarily progressive, but unfortunately no provision for progress has been made in the present case, for while as far back as 1843 the annual sum of £400 was granted to the Society for the management of the gardens, no addition to this amount is now allowed, although the area of cultivated ground has been very largely increased, immense additions have been made, and are still being made to the collection of plants, and labour and provisions are two-thirds higher in value. This amount, although supplemented by the unskilled labour of a small gang of prisoners, is totally inadequate to the present requirements of the place, and ridiculously small in comparison with the sum voted for Public Gardens in the neighbouring colonies. For the year 1876-7 the sums voted in Victoria were, Botanical Gardens, £7220; Domain and Government House Grounds, £3550. New South Wales, Botanical Gardens, £4469; Hyde Park and Domain, £3513. South Australia, Botanical Gardens, £6700. Queensland Botanical Gardens, £2485. Under such adverse circumstances it must be painfully evident that it is no longer possible, unless more assistance is rendered by Government, to keep the Gardens in a condition calculated to reflect any credit either on their immediate management or on the colony at large.

"The plants introduced during the year have been greater in number and of more intrinsic value than for some years past. About 500 have been added to the collection. From the Royal Gardens, Kew, a case containing Himalayan Rhododendrons was received in good condition; and from Messrs. A. Verschaffelt and A. Van Geart, cases containing Himalayan and hybrid Rhododendrons, pictorial trees, deciduous Magnolias, Lilies, and numerous other plants have been received.

"The number of Visitors to the gardens is estimated at 48,004, being an increase of nearly 10,000 over that of last year.

"*Museum.*—Six new show cases for shells, etc., have been constructed, and as Mr. Legrand has commenced the arrangement of the Tasmanian specimens, we hope in a very short time to have all the collection properly displayed. Mr. R. C. Gunn, in the early part of the year presented, in a most liberal spirit, the entire of his immense herbarium to the museum. As the collection had become much disarranged, and as many of the plants and much of the paper were quite destroyed, it was found necessary to re-name and re-paper the whole. This formidable task was most kindly undertaken by the Rev. W. W. Spicer and J. R. Scott, Esq., whose services in this matter it is difficult to over-rate, and who are therefore well entitled to the best thanks of the Society. Their task will still probably require several months for completion.

"Among the donations deserving special mention may be enumerated a collection of type specimens of new shells from Long Bay, presented by the Rev. H. D. Atkinson; a large collection of named shells from Mr. J. Brazier, of Sydney; several clubs and spears from New Britain and New Ireland, the gift of the Rev. G. Brown, of Sydney; a large number of type specimens of Tasmanian shells from Mr. W. Legrand; a collection of Table Cape tertiary fossils from Mr. R. M. Johnston; and a valuable named and classified collection of Algæ from Orford, Prossers' Bay, prepared and presented by Mrs. Charles Meredith.

"Although the most rigid economy has been exerted, and much which ought to have been done left undone, the grant-in-aid has been exceeded by £27 17s. With a large and continually increasing collection, it is clear that some addition to the insufficient Government grant has become a necessity.

"The number of visitors to the Museum was 18,726, being an increase of 3,711 over that of 1875."

STATEMENT OF FUNDS OF THE ROYAL SOCIETY OF TASMANIA for the Year 1876.

RECEIPTS.	£ s. d.	£ s. d.
Annual Subscriptions from 94 Members	141 0 0	
Arrears of ditto	36 0 0	
Life Member's Composition	10 0 0	
Cash from P. T. Smith, Esq. (in advance)	1 0 0	
Cash received from Marine Board for clerical assistance in completing Meteorological Tables from the Lighthouses	20 0 0	
TOTAL ROYAL SOCIETY		208 0 0
MUSEUM—Grant-in-aid from Treasury	..	200 0 0
BOTANIC GARDENS—Grant-in-aid from Treasury	400 0 0	
Proceeds of Sale of Plants, Fruit, &c.	78 2 1	
TOTAL BOTANIC GARDENS		478 2 1
1877—January 17th—Balance overdrawn at Commercial Bank	..	63 12 8
		£949 14 9
NOTE.—*Dr.*—To overdrawn balance at Bank	63 12 8	
Cash advanced by Dr. Agnew for purchase of new cases	43 9 4	
		107 2 0
Cr.—By Cash in hands of Superintendent of Botanic Gardens for payment of Wages	30 12 0	
Subscriptions due	30 0 0	
Ditto since paid	3 0 0	
		63 12 0
Balance to debit	..	£43 10 0

EXPENDITURE.	£ s. d.	£ s. d.
Jan. 19th.—Balance overdrawn at Commercial Bank, as per statement for 1875	...	47 16 10
Interest on overdrawn account, 30th June, 12s. 7d.; 31st Dec., £1 1s. 11d.	...	1 14 6
ROYAL SOCIETY.—Meteorological Instruments	1 0 0	
Printing and advertising	79 19 9	
Postage, Parcels, &c.	7 8 4	
Collector's Commission	9 5 6	
Messenger	0 10 0	
Clerical assistance for completing Lighthouse Meteorological Tables	20 0 0	
Library—Books, Stationery, &c.	30 9 10	
TOTAL ROYAL SOCIETY		148 13 5
MUSEUM—Salary of Curator	125 0 0	
Wages of Attendant	52 0 0	
Insurance	6 7 6	
Purchase and preparation of Specimens	2 1 0	
Water Rate	5 4 4	
Fuel and Light	4 12 9	
Paper for Herbarium	11 14 8	
Sundries and Petty Cash	3 15 6	
Ironmongery, Brushware, &c.	1 12 6	
Freight and Carriage of Specimens	2 8 8	
Fittings, Repairs, &c.	13 0 1	
TOTAL MUSEUM		227 17 0
BOTANIC GARDENS—Salary of Superintendent	150 0 0	
Wages of Labourers	265 0 0	
Tools and Repairs	4 1 0	
Freight and Carriage of Plants	27 0 11	
Stationery and Stamps	4 10 8	
Forage	5 15 10	
Ironmongery	32 17 5	
Repair of Buildings	2 6 6	
Seeds	2 8 0	
Sundries	27 0 8	
Water Rate	2 12 0	
TOTAL BOTANIC GARDENS		523 13 0
		£949 14 9

30th *January*, 1877.

Examined and found correct { HENRY COOK, JOHN MACFARLANE } *Auditors.*

BOOKS, ETC., PURCHASED AND PRESENTED DURING 1876.

[*Presentations marked thus**]

Arts, Journal of Society of, current numbers.
Agricultural Gazette, The, ditto.
Athenæum, The, ditto.
*Address, at opening of Session 1876. By His Excellency F. A. Weld, Esq., C.M.G. From the author.
——————, Inaugural, at opening of Session 1876, Adelaide University. From the University.
Astronomical and Meteorological Observations, United States Naval Observatory, 1870 and 1872. From Rear-Admiral F. B. Sands, Washington.
Australia, McKinlay's tracks across.
Ampullaria, On a new Species of. By the Rev. J. E. Tenison-Woods, F.G.S., F.R.G.S., etc. From the author.
Academy, American of Arts and Sciences, Proceedings vol. 9, 1874; vol. 2, 1875.
——————————————, Commemorative Notice of Louis Agassiz, by Theodore Lyman. From the Academy.
—————— of Natural Sciences, Philadelphia, Proceedings of, parts 1, 2, 3; 1875. From the Academy.
*Botanical Gardens, Imperial, of St. Petersburgh, Publications of, 1875.
*Bible, The, printed in the Irish language. Presented by Miss Fergusson, Tinderbox Bay.
*Botanical Reminiscences of British Guiana. By Dr. R. Schomburgk. From the author.
*Birds of the North-West (United States). By Elliott Cones. Presented by F. V. Hayden, Esq., United States Geological Survey.
*Colonies, The, current numbers. From the publishers.
*Catalogue, British Museum, "Marine Polyzoa," Part 3, 1875. From the Trustees.
*——————, Museum of Comparative Zoology, Harvard College, Cambridge, U.S.
Conchologia Iconica, Parts 322 to 329.
*Collectors' Handy Book for Ferns, Mosses, etc. Presented by the Rev. W. W. Spicer, M.A., F.R.M.S.
*Cholera, Epidemic of, in United States, 1873, Report on. By J. M. Woodward, M.D. Presented by the United States Government.
*Climbing Plants, on the habits and movements of, 1875. By Charles Darwin, M.A., F.R.S. From His Excellency the Governor.
*Exhibition, Melbourne, 1875, Official Record of. From the Commissioners.
*Education, Public, Pennsylvania, U.S., Report of Board of, 1874. From the Board.
——————, the scientific, of Mechanics and Artizans. By Andrew P. Peabody. From the Smithsonian Institution, Washington.
*Earths Interior, Present condition of. By G. Kittredge. From the Buffalo Society of Natural Sciences.

*Explorations of the Colerado of the West, United States. By Professor Powell.

Florist and Pomologist, The, current numbers.

Feathers, Stray (Indian Ornithology), Vol. 3, parts 5 and 6; Vol. 4, parts 1, 2, 3.

*Flora of S. Australia, The. By Dr. R. Schomburgk. From the Author.

*——— Colerado, Synopsis of. By T. B. Porter and J. M. Coulter. From F. V. Hayden, Esq., United States Geologist.

*——— British India, Part 4. By J. D. Hooker, C.B. From the Secretary of State for India.

*Flowers, British Wild, in relation to Insects. By Sir John Lubbock, M.P., F.R.S. From Rev. J. E. Tenison-Woods.

Gardeners' Chronicle, The, current numbers.

Geological Magazine, The, ditto.

*Geography, Physical, of the Atlantic. By Captain Toynbee, F.R.A.S., F.R.G.S. From Meteorological Office, London.

Geological Survey of India, Records of Vol. 8, parts 1 to 4; Vol. 9, part 1. Memoirs of Vol. 1, Nos. 2 and 3, "Jurassic Fauna of Cutch," "Cephalopoda" (Palæontologia Indica), Ditto Vol. 2, Part 2. Ditto Part 4, ser. 9. From the Government of India.

——————— the Territories (United States), Report Vol. 6. -Bulletin of No. 2, and 2-3, second series.—Geological and Geographical Survey of Colerado, 1873.—Lists of elevations of part of United States, west of the Mississippi River.—Catalogue of publications of the department. Report of, Vol. 2, 1865. Bulletin of Vol. 1, Nos. 5 and 6, and Vol. 2, No. 1. Catalogue of Photographs 1869-1875. From F. V. Hayden, Esq., United States Government Geologist.

*Geological Exploration of the 40th Parallel, United States, Vol. 3, "Mining Industry," with Atlas; Vol. 5, "Botany."

*——— and Geographical Explorations and Surveys west of the 100th meridian (U.S.), "Topographical Atlas," 12 sheets and title-page. From the American Government.

*Geology, History of Australian. From the author, the Rev. J. E. Tenison-Woods, F.G.S., &c.

*Historical and Archæological Society of Ireland, Annual volume of, for 1874. Journal of Nos. 20, 21, 22. From Dr. Agnew.

*History, Surgical, of the War of the Rebellion, Vol. 2. From the United States Government.

*Hawaii, Reminiscences of a Visit to Volcanoes of. From the Author, His Excellency F. A. Weld, Esq., C.M.G.

*Helix, on a new reversed Tasmanian. From the author, the Rev. J. E. Tenison-Woods.

*Institute, Essex (Salem, Mass., United States), Bulletin, Vols. 5 and 6, 1873-4. From the Institute.

*Journal, Quarterly of Science, current numbers.

*Journals, House of Assembly, Tasmania. From Government.

*Locusts, on the appearance of, on Lake Bieler, 1875. From the author, Albert Müller.

*Longitude, Report on difference of, between Washington and St. Louis. By Prof. W. Harkness. From the author.

Magazine, Country Gentleman's, The, current numbers.
*Mathematische anzieger, Nos. 21 and 28, 1874-5. From the Royal Academy of Sciences, Vienna.
*Musée Tayler, Haarlem, Archives, vols. 1, 2, 3, and part 1 vol. 4. From the Directors.
*Memoir of C. P. von Martius, by Charles Rau. From the Smithsonian Institution, Washington.
*Museum of Comparative Zoology, Harvard College, Report for 1873. From the Trustees.
*Minerals of New South Wales, The. From the author, Professor A. Liversidge.
*Moth, Codlin, on the. By His Honor Mr. Justice Dobson. From the author.
*Meteorology. Observations in New Zealand, 1874-5. Ditto for Wellington, Nov., 1875 to Oct., 1876 Abstracts of observations January to July, 1876. Comparative table of climate, for 1875. From the Director of Observatories, Wellington.
*————. Results of Observations in New South Wales, 1874, Monthly tables from October, 1875, to April, 1876. From the Government Observatory.
*————. Report of Kew Committee of Royal Society, 1875. From Royal Society, London.
*————. Report of Chief Signal Officer, Washington, U.S., 1872-3. Daily Bulletin, Dec., 1872, to June, 1873. Washington Observations, 1873. From Brig.-Genl. Myer, Chief Signal Officer, Washington, U.S.A.
*Meteorological Office, London. Quarterly Weather Report, part 2, April to June, 1874. Meteorology of Japan, 1876. From the office.
*———— Observations, Hobart Town, monthly tables. From F. Abbott, F.R.A.S., F.R.M.S.
*————————, Port Arthur, ditto. From Dr. Coverdale.
*————————, Mount Nelson, Goose Island, Swan Island, Kent's Group, King's Island, and South Bruni, ditto. From the Hobart Town Marine Board.
————————, Melbourne, monthly tables. From the Government Observatory.
*Magnetic Dip, Observations on, at Kew. From the Director, Kew Observatory.
Natural History, Annuals and Magazine of. Vol. 16, Nos. 95, 96; vol. 17, Nos. 97 to 102; vol. 18, Nos. 103 to 106.
Nature, Current numbers.
*Natural History, Anderson School of, Penikese Island, United States, The Origin and Progress of. From the Trustees.
*Newspapers, Old English, 10 Reprints of. From Mr. J. B. Mather.
*Nudibranchiata, Notes on New Species of. By the Rev. J. E. Tenison-Woods, F.G.S., etc. From the author.
*Navy Register, United States. From the American Government.
*Orchids, Australian, Vol. 1. From C. M. Maxwell, Esq.
*————, parts 1 and 2. From Government of New South Wales per Colonial Secretary, Tasmania.

*Phytographiæ Australiæ, Fragmenta, vols. 1, 6, 9. From the author, Baron F. von. Mueller, C.M.G., M.D., F.R.S., etc.
*Phytography of Tasmania, Contributions to, part 4. By the same. From the author.
*Plants, on select texile. From the same.
*———, on Food of. By W. E. McIvor. From the same.
Plantarum, Genera. By G. Bentham and J. D. Hooker.
*Patents, Abstracts of Victorian, 1876. From Registrar-General, Victoria.
*Photgraphy, Dictionary of. By Thos. Sutton. From the Rev. J. E. Tenison-Woods.
*Patellidæ, On some Tasmanian. By the Rev. J. E. Tenison-Woods, F.G.S., etc. From the author.
*Platypus, On the effects of wounds inflicted by the spur of. By Rev. W. W. Spicer, M.A. From the author.
Report of British Association, 1875.
*———, 10th Annual, of Colonial Museum, Wellington, New Zealand. From the Director.
*———, 7th Annual, Museum of Natural History, New York. From the Director.
*——— of progress and condition of Botanic Gardens and Government Plantations, Adelaide, 1875. From Dr. R. Schomburgk.
*——— of Smithsonian Institution, 1871 and 1873. From the Smithsonian Institution.
*——— on the Chemistry of the Earth. By F. Sterry Hunt. From the same.
*———s on Meteorological, Magnetic, and other observations in Canada, 1875. From G. T. Kingston, Esq., Government Observatory, Toronto.
*Society, Philosophical and Literary of Leeds, Report 1874-5. From the Society.
*————, Entomologique de Belgique, Comte Rendu. From the Society.
*————,Meteorological of London, Journal of. From the Society.
*————, Royal, Proceedings of, current numbers. From the Society.
*————, Zoological, of London. Proceedings, part 4, 1874; parts 1, 2, 3, 1875, &c. From the Society.
*————, Geological of London, Quarterly Journal of, Nos. 119 to 124. List of, 1875. From the Society.
*————, Royal Geographical, Journal Vol. 14, 1874. Proceedings Vol. 19, Nos. 1 to 7, 1875.
*————, Royal Asiatic, Journal of, Vol. 7, part 2. Annual Report, 1875.
*————, Linnean, Journal of, Nos. 78 to 8 (Botany); No. 12 (Zoology).
*————, Royal Asiatic of Japan, Transactions, Vol. 3, part 2.
*————, Linnean of New South Wales, Proceedings of, Vol. 1, parts 1, 3.
*————, Royal Astronomical, Monthly Notices of, Nos. 2 to 8, 1876. Memoirs of, Vol. 39, part 2, 1871-2; Vol. 42, 1873-1875.
*————, Boston, of Natural History, Memoirs of, Vol. 2, part 2 No. 4; part 3, Nos. 1 to 5; part 4, No. 1. From the Society.

*Society, Boston, Proceedings of, Vol. 15, parts 3 and 4; Vol. 16, parts 1, 2, 3, 4; Vol. 17, parts 1, 2. Report of meeting of. From the Society.

*———, Buffalo, of Natural Sciences, Bulletin of, Vol. 1, No. 4; Vol. 2, Nos. 1, 2, 3, 4; Vol. 3, Nos. 1 and 2. From the Society.

*———, American Philosophical, Proceedings of, Vol. 14, Nos. 92, 93, 94, 95. From the Society.

*———, Royal, of New South Wales, Proceedings of, Vol. 9, 1875.

*———, Adelaide Philosophical, Publications of, various. From the Society.

*———, Geological and Polytechnic, of West Riding of Yorkshire, Proceedings of, N. S. parts 1 and 2. From the Society.

*Statute Index, Tasmania. By H. M. Hull. From the Author.

*Statistics of New Zealand. From New Zealand Government.

*——— Tasmania. From Government Statistician.

*——— Victoria. From Government Statist.

*Stars, Catalogue of 1845 to 1871. From the U.S. Naval Observatory, Washington.

*——, Zones of, observed with mural circle, 1846-1849.

*———, ——— ——— Transit instrument ditto. From ditto.

*———, ——— Results of observations, 1853 to 1860. From ditto.

*———, Equatorial Fundamental, On Right Ascensions of, 1870. From ditto.

*Smithsonian Miscellaneous Collections, vol. 10. From the Smithsonian Institution.

*Shells, Descriptions of eleven new species. By J. Brazier, C.M.Z.S. From the author.

*———, ———ten———. By the same. From ditto.

*———, Synonymy of and Remarks upon Tasmanian and other. By the same. From ditto.

*Trade, Free, the creed of, 1875. By D. A. Wells, LL.D. From the Cobden Club, London.

*Treaties of Commerce, On. From ditto.

*Transactions of New Zealand Institute, vol. 8, 1875. From Dr. Hector.

*——— of Society of Engineers and Shipbuilders in Scotland, vol. 19, 1876. From the Society.

*Tea, a lecture on. By Baron von Mueller. From the author.

*Tertiary Marine Deposits of Tasmania, Notes on. By R. M. Johnston. From the author.

*Tertiary Fossils, Tasmanian. By the Rev. J. E. Tenison-Woods, F.G.S., etc.

*University, Howard, United States, Report of, 1875-6.

*Victoria, Natural capabilities of. By Baron F. von Mueller, C.M.G. &c.

*Victorian Year Book. By H. Hayter, Government Statist, Victoria (3 Copies.)

*Wales, New South, Progress and Resources of, 1876. From Government of New South Wales.

*———, ———, Mineral Map and Statistics of. From ditto.

Zoology of the "Erebus and Terror," parts 19 to 24.

**Zapus hudsonensis*, Account of. By Dr. Elliott Coues. From United States Government.

PRESENTATIONS TO MUSEUM DURING 1876, WITH NAMES OF DONORS.

Atkinson, Rev. H. D.—26 specimens of new shells from Long Bay.

Bennett, Dr. G., F.Z.S., Sydney.—An ammonite from Western Australia. Two portions of Humerus, and two ditto of Lower Jaw of Diprotodon, from Darling Downs, Queensland.

Boyes, Mr. Lukin.—A large specimen of a species of *Spondylus*. Two very large Earthworms from Gould's Country.

Baker, Mr. J., Sydney.—Two samples of Tin Ore from New South Wales.

Barclay, C. J., Esq.—Specimens of the copper coinage withdrawn from circulation in 1875. 25 pence, and 25 half-pence. 28 specimens of the Bronze coinage in circulation in Tasmania at the time of the withdrawal of the copper currency.

Blyth, Mr., Honeywood.—Two Black Snakes *(Hoplocephalus curtus.)* Two insects from the upper branches of a Stringy Bark tree.

Baynton, Mr.—Specimen of silicified wood from Brown's River Beach.

Barnard, Mr. D. M.—A yellow-bellied Beaver Rat *(Hydromyss chrysogaster)* from Fingal.

Butler, A. A., Esq.—Tin specimens from lode, tin nuggets, etc., from Cascade River, Belmont, Ringarooma.

Briant, Mr. W. G.—32 specimens Tasmanian Lepidoptera.

Bealey, Mr.—A large fungus (probably *Polyporus igniarius*) from a tree.

Bailey, Rev. J. H. Brooke.—3 Silver and 4 copper coins from Ceylon.

Bidencope, Mrs. J.—Two cases of Indian *Lepidoptera*.

Browne, Mr. R. M.—15 New Zealand and 3 Australian copper tokens.

Brown, Rev. G., Sydney.—8 spears and 3 clubs from New Britain and New Ireland.

Brazier, Mr. John, C.M.Z.S., Sydney. 755 named specimens of Shells, with list.

Bagley, Mr., Oatlands.—A young Tippet Grebe *(Podiceps australis.)*

Coverdale, Dr., Port Arthur.—A large hair ball from the stomach of a calf six weeks old.

Coote, Mr. Audley.—6 sections of Australian and New Zealand Telegraph Cable showing shore end, intermediate, and deep sea portions.

Crowther, Dr. E. L.—A large collection of tin specimens from Gould's country. A specimen of the Nankeen Night Heron *(Nycticorax caledonicus.)*

Cooper, Mr. Sorell.—Head of Sheep with curious horny growth from ear.

Castray, L. R., Esq.—A very large Egg from a half-bred Brahma Fowl.

Castles, Mr.—Tin Ore from Schouten Island.

Dumbleton, Major.—Two casts of Fossils from River Mersey.

Davies, Mr. C. E.—A Chestnut-faced Owl *(Strix castanops.)*

Edwards, Mr. F.—Tusk of large Boar, shot in New Zealand.

Edmonson, E., Esq.—A white-breasted Oyster Catcher *(Hæmatopus longirostris.)*

Forrest, Master L.—33 specimens of *Lepidoptera.*
Feeney, Mr.—Sample of Coal from Sandfly Rivulet.
Fergusson, Mr. J., Tinderbox Bay.—A collection of Shells from Cloudy Bay.
Free, Mr. W.—A Petrel (Broad-billed Prion) *Prion vittatus*, killed inland at Muddy Plains.
Gillon, Mr.—Specimen of Opal from Cornelian Bay Cemetery.
Graves, Mr. J. W.—A Water Crake (*Porzana tabuensis.*)
Gunn, R. C., Esq., F.R.S., etc.—An extensive Herbarium of Tasmanian Plants.
Groom, F., Esq.—A specimen of the Brown Quail (*Synoicus australis*) partially albino, from St. Mary's.
Guesdon, Mr.—A slab of mudstone with numerous casts of fossils, from Bruni Island.
Gulliver Miss, per M. Allport, Esq.—Six prepared skins of birds from Gulf of Carpentaria.
Gill, Mr. H., Ringarooma.—Tin Ore from Star claim, Cascade River.
Harrison, Mr. Cades, Brown's River.—Specimen of the Owlet Nightjar (*Ægotheles novæ hollandiæ.*)
Hull, H. M., Esq.—Skull of "Native Tiger" (*Thylacinus cynocephalus.*)
Hall, Mr. W. E.—A specimen of the Long-eared Bat (*Nyctophilus unicolor*).
Hardy, Mr. W. F., St. Mary's.—Eggs and young of Leech.
Hood, Master E.—Specimen of the "Gulf Weed" (*Sargassum sp.*)
Hickman, Mr. O.—An Echidna.
Jeffrey, Mr., New Norfolk.—Specimens of fossiliferous limestone.
Jackson, Mr. A.—An albino Wattle Bird (*Anthochæra inauris*).
Johnston, Mr. R. M.—A collection of Tertiary Fossils from Table Cape.
Johnston, Mr. A. R., Telegraph Department, Townsville, Queensland. A net bag made by Aborigines of Northern Queensland.
Johnston, Mr. H.—A tenpenny piece 1813, Irish.
Keen, Mr. J.—Sample of a plumbago-like substance from Kingston.
Ludbey, Mr.—Two specimens of Fossil Wood from Brighton.
Lewis, J. K., Esq.—Specimen of the Caspian Tern (*Sylochelidon caspia*) shot at Frederick Henry Bay.
Legrand, Mr. W.—About 50 specimens of new Tasmanian Shells.
Legge, Captain R.A. A living specimen of the White-bellied Sea Eagle *(Haliætus leucogaster)* from Ceylon.
Morrisby, Mr. T.—A White Hawk *(Leucospiza nova hollandiæ).*
Maclanachan, Hon. J., Esq.—An Egyptian Goose *(Chenalopex egyptiaca).*
Martin, Mr. J. J.—Boulder *(Septarium)* from Moeraki Beach, New Zealand. Part of stem of Tree Fern prepared for picture-frame making. Rock specimen with crystals of arragonite from Dunedin. Specimen of Oamaru Limestone, Lignite from Green Island, and coal from Greymouth, New Zealand.
Meredith, Mrs. Charles.—A valuable named and classified collection of Algæ from Orford, Prosser's Bay. Skin of a "Rock" Opossum.
Miles, Mr.—A Tiger Shark.

McDiarmid, Captain, Brig "Moa."—Vertebra of a Whale. A Club from Island of Tanna.

Nairn, Mr.—Two Black Snakes *(Hoplocephalus curtus.)*

Nichols, Mr.—Sample of Coal from Port Cygnet.

O'Keefe, Mr.—Barnacles from bottom of steamship "Mangana."

Piguenit, Mr. W.—Specimen of the paper like bark of a species of Tea-tree from N. S. Wales.

Pettard, Mr. W. F.—18 Specimens of Land Shells from Yule Island, New Guinea.

Petersen, Mr.—Tin Specimens from Ringarooma.

Pearsall, Mr.—A Tiger Cat *(Dasyurus maculatus.)*

Ross, Rev. J.—A large mounted specimen of the Monitor Lizard, from Australia.

Risby, Mr. J. E.—A large Crab from Pirate's Bay, Eagle Hawk Neck.

Rice, Mr. G.—A Fresh-water Crayfish *(Astacus sp.)* from McRobie's Gully.

Roberts, Mr., Huon.—A mass of fibre of bark of a tree which had been struck by lightning. A white-fronted Falcon *(Falco lunulatus.)*

Scholes, Mr. J. S.—Two silver, and 34 brass and copper coins. Specimen of "Chrome," from Dun Mountain, New Zealand.

Simson, A., Esq.—Skins and Skeletons of *Antechinus swainsonii*, and two species of Rat from Gould's Country.

Stephens, T., Esq.—Specimens of wood and foliage of "Red Pine" *(Athrotaxis selaginoides)* and "Pencil Cedar" *(Athrotaxis cupressiformis)* from Middlesex Plains, Tasmania.

Stephenson, Mr.—A Rail *(Rallus brachipus)* from Jericho.

Savage, Mr. R.—A Grey Flying Squirrel *(Belidens sciurus)* from the Shannon.

Spencer, Mr.—Sample of Coal from Jerusalem.

Scott, J., Esq., M.H.A.—An aboriginal Stone Implement.

Spicer, Rev. W. W.—A sample of "Pulu," or down of a species of Tree Fern—used in the Hospital for pillows, etc.

Swan, J., Esq.—Skin of *Belidens sciurus.*

Turner, Mr.—A Musk Duck *(Biziura lobata.)*

Valentine, Dr., Campbell Town.—A Pouched Lamprey *(Geotria allporti.)* From the South Esk.

Williams, Mr. T.—A specimen of the Pacific Heron *(Ardea pacifica)* shot on Lake Tiberias.

Weston, Maurice, Esq.—Skeleton of Australian Crane (*Grus australasianus*).

Woods, Rev. J. E. Tenison.—Crabs from Bruni Island.

Wilkins, Mr. A.—Specimens of Tin, Antimony, Copper, etc., from Cudegong, N. S. Wales. Silver ore from Mitchell's Creek.

Weeding, Mr., Oatlands.—Mass of fibrous substance from a hollow tree.

Wright, S. P. H., Esq., Glenorchy.—Ditto.

Williams, Mr. R. M.—Crystals of Oxide of Tin, and two Sapphires from Queensland.

Young, Mr. J.—Specimen of "Sea Hare" (*Aplysia*) from beach in Domain.

Young, Mr. J., Wellington, N. Zealand.—A portion of the Cook's Straits Telegraph Cable, broken nine years after submersion.

PLANTS AND SEEDS RECEIVED AT BOTANIC GARDENS DURING THE YEAR 1876.

January 13th. From Messrs. Vilmorin, Andrieux & Cie., Paris.—1 packet seed, 4 ditto Achimenes.

January 13th. From Baron Ferd. von Mueller.—6 packets seeds.

January 22nd. From Mons. J. Verschaffelt, Ghent, Belgium, per St. Osyth.—1 case Rhododendrons, Tree Peonys, and Pictorial Trees.

January 22nd.—From Walter Hill, Esq., Director Botanic Gardens, Queensland.—1 case plants.

January 26th.—From the Botanic Gardens, Christchurch, New Zealand.—1 case plants.

January 27th.—Mr. S. Purchase, nurseryman, Sydney, New South Wales.—1 case plants.

January 27th.—From the Botanic Gardens, Calcutta.—Seeds of Pinus longifolia.

February 5th.—From Mr. Wm. Bull, New Plant Merchant, London.—22 varieties Lily.

January 28th.—From Mr. Wm. Waterhouse.—Seeds, "Pride of Demerara."

March 14th.—From Messrs. Vilmorin, Andrieux & Cie, Paris.—3 packets seeds.

March 21st.—From Dr. Curl, Otago, New Zealand.—2 packets seeds.

April 8th. From the Royal Gardens, Kew.—Case containing Cork Oaks and Himalayan Rhododendrons.

April 22nd.—From Jules Cock & Sœurs.—18 packets seeds.

April 22nd.—From Messrs. Hubers and Co., France.—48 varieties seeds.

April 29th—From Lady Rolle, Picton, Chudleigh, England.—11 packets Coniferæ seeds.

May 17th.—From His Excellency F. A Weld, Esq.—20 papers seeds.

May 19th.—From Dr. Webster, Dunedin.—3 New Zealand Tree Ferns.

June 2nd.—From Mr. G. Farnsmouth, London.—1 case seedling Rhododendrons.

June 8th.—From the Chamber of Agriculture, Washington.—63 papers seeds.

June 19th.—From Mr. Samuel Purchase, nurseryman, Sydney, New South Wales.—Case containing 60 plants.

June 23rd.—From Dr. Curl, Wellington, New Zealand.—6 papers seeds.

June 26th.—From Messrs. Nardy & Cie., Hyerès, France.—16 papers seeds.

August 3rd.—From Mr. G. Brunning, St. Kilda Nurseries, near Melbourne.—Case containing 78 plants.

August 7th.—From Messrs. Shepherd & Sons, Darling Nursery, Sydney.—Case containing 63 plants, and 33 varieties scions, 83 papers seeds.

September 11.—From A. Thozet, Esq., Queensland.—Seeds, 4 species Cycads.

September 18th.—From the Botanic Gardens, Christchurch, New Zealand, one box scions.

October 13th.—From the Royal Gardens, Kew, London.—48 papers seeds.
November 13th.—From the Botanic Gardens, Christchurch, New Zealand.—Box containing 60 plants.
November 25th.—From F. Sander and Co., St. Alban's, near London. —9 varieties Orchids.

PLANTS AND SEEDS SENT FROM THE BOTANIC GARDENS DURING 1876.

Jan. 29th.—To Mons. J. Linden, Ghent, Belgium.--12 Tree Ferns.
January 29th.—Per "Lufra," to Mons. J. Verschaffelt, Ghent, Belgium.—12 Tree Ferns.
March 7th.—To the Chamber of Agriculture, Washington, United States.—Package seeds.
March 7th.—To Mr. M. Tunaki, Agricultural Department, Japan.—1 package seeds.
April 19th.—Per "Alfred Hawley," to Mons. August Van Greet, Ghent, Belgium.—6 Tree Ferns.
May 15th.—To Jules Cock & Sœur, France.—3 species Cordyline seeds.
May 15.—To Ch. Huber & Cie., Hyerès, France.—3 species Cordyline seeds.
May 15th.—To Messrs. Vilmorin, Andrieux & Cie., France, 3 species Cordyline seeds.
May 30th.—To Mr. Samuel Purchase, nurseryman, Parramatta, near Sydney.—1 case plants.
May 30th.—To Messrs. Shepherd Sons, Darling Nursery, Sydney, New South Wales.—1 case plants.
June 10th.—To the Acclimatisation Society, 19 Rue de Lille, Paris. —1 package seeds.
June 14th.—To the Botanic Gardens, Melbourne.—1 case plants.
June 20th.—Mr. Samuel Purchase, Somerset Nursery, Sydney.—1 box seeds.
June 20th.—To Messrs. Shepherd & Co., Sydney.—One box seeds.
July 24th.—To the Botanic Gardens, Christchurch, New Zealand. Case containing 48 plants.
July 25th.—To Mr. G. Brunning, nurseryman, Melbourne.—Case plants and seeds.
September 29th.—To the Botanic Gardens, Christchurch, New Zealand.—1 box plants.

PLANTS SUPPLIED FOR PLANTING PUBLIC PLACES DURING 1876.

May 16th.—For the Launceston Hospital.—30 Coniferæ.
May 18th.—For Church of England Grounds, Bothwell.—130 plants.
June 9th.—For the Queen's Asylum.—Collection plants.
June 23rd.—For the Hobart Town Cemetery.—180 plants.
July 10th.—For Church grounds, Avoca.—50 plants.
July 10th.—For Grounds of Horton College, Ross.—100 plants.
July 29th.—For Congregational Church, Richmond.—36 plants.
August 8th.—For the Cornelian Bay Cemetery.—150 plants.

F. ABBOTT, Jun., Superintendent.

PLANTS INTRODUCED INTO THE ROYAL SOCIETY'S GARDENS, 1876.

Abutilon boula de neige
,, megapotanicum variegatum
,, Sellowianum marmoratum
Acer dissectum
,, ,, roseus pictis
,, atropurpureum
Achillea eupatorium
Achyranthus aurea reticulata
Adiantum hirsutum
,, pubescens
Æsculus Stevensi
,, laciniatum
Allsophila Cooperi
Alocasia metallica
,, violacea
Aloysia bergamotta
Alphistonia excelsa
Andromeda mariana
Angelonia grandiflora
Anigozanthus pulcheri
Anthericum Rossie
Anthurium cordifolium
Aquilegia olympica
Aristolochia gigantea
Aspidistra lurida variegata
Asplenium falcatum
Aucuba fœmina
,, limbata
,, longifolia
,, macrophylla
,, mascula
,, picta
,, salicifolia
,, viridis
Audibertia polytricha

Baccharis halamifolia
Beaumontia grandiflora
Begonia argyrites
,, canary bird
,, Veitchei
Betula laciniata
,, pendula
Bignonia alba lutea
Bossiaea microphylla
,, scolopendrium
Bowenia spectabilis
Brazillian cherry
Bubthalmium salicifolium
Buxus sempervirens variegata

Callicarpa cana
Campanula glomerata
Cassia chamæcirta
Cantaurea procumbens
Cerasus folius variegatus
Ceropegia elegans
Cinnamomum dulce
Clarkia elegans alba plœno
Clerodendron Thompsoni
Coleus grotesque
Cookie punctata
Corylus avellana pendula
Cupressus filifera
,, horozontalis argentea
,, ,, Turneri
,, ,, variegata
,, sempervirens variegata
Cycas angulata
Cydonia Moorlosi
Cyperus alternifolius variegatus
Cystopteris Dyckiana

Dalecampia Roezliana
Dombeya Mastersi
,, natalensis
Dichorisandra thyrsiflora
Dicksonia Smithii
,, Youngiana
Dieffenbachia picta
Dillwynia acicularis
,, mollissinia
Dracæna amabilis
,, alba marginata
,, Gayi
,, Guilfoylei
,, Shepherdi
,, Wrightii
,, Youngii
Dracocephalum Ruysciana

Echeveria abyssinica
Edworthia grandiflora
Erica autumnalis
Eryngium Lewenworthi
,, pandanifolium
Eschynanthus Lobbi
Eucalyptus hæmastoma
,, hemophloia
,, longifolia
,, meliodora
,, siderophloia
Euphoria Litchi

Eurya latifolia variegata

Ficus Bengamini
,, lucida
,, lurida
,, obtusata
Franciscea latifolia
Fraxinus excelsa Stewarti
,, dissectum variegatum
Fuchsia microphylla

Garcinia mangostana
Gardenia magnifica
Genetylis fuchsioides
Gymnogramma Muelleri
Gymnostachya giganteum

Hebeclinum ianthinum
Heliotropium aureum
,, little negress
Hibiscus campdeni
,, Lambertiana
,, liliiflorus
Howenia dulcis

Inga aurea
,, pulcherrima

Jacaranda mimosiœfolia

Laelia albida
,, autumnalis
,, majalis
Lactaria calicarpa
Laurus ceylonica
,, nitida
Ligustrum aureus variegatus
Lobelia cardinalis
,, syphilica
Lygodium scandens

Macrolopia strigosa
Macrozamia corallipes gyrata
,, Migueli
,, Perowskiana
Mangifera indica
Magnolia Campbelli
Maranta regalis
,, sanguinea
Marshallia cæspitosa
Mimulus alatus
Musa superba

Nephelium longana

Nerium album plæno

Odontoglossum cordatum
,, Leopoldianum
Oncidium barkeri
,, cavandishianum
,, tigrinum
Owenia cerasifera
Oxycoccus macrocarpus

Panicum plicatum
Papaver pilosum
,, umbrosum
Passiflora Bounapartea
,, decaisneana
,, granadilla
Pavonia coccinea
Pentstemon albiflora
Periploca græca
Petrophila pulcheri
Phillodendron lindenianum
Phlox Nelsoni
Pimenta vulgaris
Pinus edulis
,, Kashiana
,, Lowdoniana
,, macrocarpa
,, monophylla
,, Pattoniana
Polypodium glaucum
Pteris pedata
,, scaberrula
Pyrus aucuparia pendula

Retinospora obtusa variegata
Rhaponticum nivium
Rubus rugosa

Salvia gigantea
,, sanguinea grandiflora
Scutellaria macrantha
Spiræa palmata
Silene saponaria
Stephanotus Thouarsi
Stipa tenacissima
Strelitzia juncea
Syncarpia albens

Tacsonia Buchananni
,, insignis
Taxus baccata argentea
Tecoma fulva
,, Stans
,, velutina

Tetratheca verticillata
Thibandia macrantha
Thunbergia laurifolia
,, Harrisi
Thuja occidentalis variegata
Tilia argentea variegata
,, pendula
Tulipa clusiana
,, cornuta
,, elegans
,, lutea major
,, Markgraf de Bade
,, oculis solis
,, perfecta
,, persica
,, parrot constantinople
,, ,, gloriosa
,, ,, red
,, ,, rubra et lutea
,, ,, yellow
Tupa Bridgesi
Tydea venosa

Ulmus aurea

Vanilla aromatica

Whitsenia solanacea
Wisteria Bidwilli

Yucca oloifolia variegata

Zamia Mackenzii

ROSES.

Annie Laxton
Auguste Rigotard
Deuil de Paul Fontaine
Emile Hansburgh
Felix Genero
Francois Sacharme
,, Michelon
,, Madame Eugene Verdier
,, Madame Morceau
,, Marie Beauman
,, Maurice Bernardin
,, Monsieur Boncenne
,, Perle de Lyon
,, Princess Beatrice
,, Queen of Waltham
,, Reynolds Holes
,, Richard Wallace
,, Star of Waltham

RHODODENDRON.

Adelo
Amazon
Alarm
Aboreum
August van Geert
Carbatum
Beranger
Bijou
Blandfordiæflorum
Camelliæflorum
Cinnabarinum
Compt de Flandre
Dalhousie
Evelyn
Griffithianum
Isabella
John Waters
Lady Molesworth
Lord Elgin
Macculatum nigrum
Maddenni
Marion
Nero
Ninon d'Enclos
Ophelia
Paxtoni
President Van den Heck
Prince Camille de Rohan
Prince of Wales
Princess of Wales
Princess Alice
Rebecca
Rhoda
Rosalie
Rosetta
Satanella
Sir Thomas Ackland
Souvenir de Jean Byls
Stella
Stephanie
Towardianum
Vicompt de Blois
Vivid

CAMELLIA.

Augusta superba
Beali rosea
Belle de fierense
Belle de ponteau
Bonomiana
Countesse Cellini

Carlotta Papindoff
Compt de Paris
Countesse of Orkney
Don Raleri
Henri Favre
Imbricata
Jenny Lind
La pace
Lavinia Maggi
Lavinia Maggi rosea
Noli ne tanque
Princess Frederick William
Queen Victoria
Rose la Reine
Sanchezi
Tragioni
Vandessa superba

AZALEA.

Alba delecta
Amœna
Baron de Prie
Colorans
Duc Adolph de Rossau
Duc de Brabant
Exquisite
Fielderi
Glory of Sunning Hill
Murrayanum
Obtusifolia
Obtima
Rosea superba
Splendens
Vittata punctata

MOUTAN PŒONY.

Cardinal Antonella
Comptesse de Flandre
Elizabeth
Evelyn
Fimbriata carnea pl.
Fragrans maxima plœno
George Rollison
Leader
Madame d'Andrimont
,, Catelan
,, Jules urban
,, Leduc
,, Stewart Low
Mademoiselle Shenmakers
Professor Dalbeauf
,, de Konninck
President Lambinon
Purpurea violacea
Regia
Rubra odorato plenissima

GERANIUM.

Agrippa
Brigand
Brigantine
Black Prince
Celeste
Charles Turner
Cynthia
Czar
Duke of Edinburgh
Edgar
Happy thought
Imperator
Lady of the Lake
Leotard
Mayday
Mrs. Ford
Miss in her teens
Pompey
Prime Minister
Pasha
Queen Victoria
Sultana

FUCHSIA.

Cannell's gem
Delight
Lady Heytesbury
Little Bobby
Lizzie Hexham
Nabob
Pyrene
Symmetry
Transplendent

CHRYSANTHEMUM.

Barra
Clementine
Dr. Rogers
Ernest
Gazelle
Gustave Roy
Japanese Empire
Lustina Lewia
Mrs. Dix
Mrs. S. Morgan

Mrs. L. Peabody
Miss Florence Nightingale
Nelly
Pablo
Rajah
Baron des Sandwich Isles
The little gem
Thermos
Yeddo lilac

LILIUM.

Californicum
Callosum
Candidum variegatum
Chalcedonicum
Dovuricum fulgidum
,, grandiflorum
,, Johnsoni
,, Sappho
Elegans atrosanguineum
,, maculatum
,, splendida
,, staminosum
,, eximeum
,, Humboldtii
,, monodelphum Schooitzianum
,, parvum
,, purpureum
,, superbum
,, superbum pyramidale
,, tenuifolium
,, tigrinum flora plœno
,, ,, jacundam

HYACINTH.

Charles Dickens
Crœsus
Grand Lilas
Garrick
Grand vedette
Heroine
Homerus
King Acingarius
Latour d'Auvergne
Lord Wellington
Lieutenant Waghorn
Mammoth
Mars
Mimosa
Prince of Waterloo
Queen of Netherlands

TULIPS.

Admiral Kingsbergen
Belle Lisette
Canary bird
Cornuta
Cerise gris de lin
Cousine
Claremont
Couronne Imperiale
Cramoise superb
Duc van Thol, crimson
,, gold striped
,, white
Elegans
Fiance
Florentina
Germaniæ
Globe de Rigot
Leon d'orange
La blason
La belle Alliance
Lac de Chine
Lutea major
Maulas
Markgraff de Bade
Meteor
Oculis solis
Pœony gold
Parroquet Constantinople
,, gloriosa
,, red
,, rubra et lutea
,, yellow
Pax alba
Persica
Pottebacker white
,, yellow
Proserpine
Queen Victoria
Red gris de lin
Reginæ rubrum
Roi Pepin
Rose aplatis
,, mundi
,, triomph
Standard royal
Vander Nees
Wonverman

APPLES.

Annie Elizabeth
Api

Betty Geeson
Sceptor d'or
Buff
Buncomb
Burchard reinette
Carolina red June
Cheoce
Dougharty
Early harvest
Evagil
Kentish fillbasket
Maidens apple
Mother
Shockley
Small's admirable
Striped beaufin
Stirling castle
Tower of Glammis
Warner's king
Wheeler's russet
Winter queening
Wormsley pippin

PEARS.

Alexander Bivort
Beurre de Amalis
Compt de Flander
Doyenne Défais
Fondant de Curne
Gansels Seckle
Huyshe's Prince of Wales
Leopold
Soldat d'Esperen
Triomph de Lamy

PEACHES.

Barrington
Lady Palmerston
Prince of Wales
Salway

NECTARINES.

Albert Victor
Balgowan
Elruge
Lord Napier
Stanwick Elruge
Victoria

CHERRY.

Ohia beauty
Reine hortense

PLUM.

Imperatrice de Milan
Jodoigu green gage
Prince Engelbert

GRAPE VINES.

Allan's black
Black Manuka
Catawba
Chaptal
Elsinburgh
Trentham black

F. ABBOTT, Jun.,
Superintendent.

Printed at the "Mercury" Steam Press Office, Hobart Town.

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mania. 23-91014
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