APR 6 1901

MONTHLY NOTICES

4987

OF

PAPERS & PROCEEDINGS

OF THE

ROYAL SOCIETY

OF

TASMANIA,

FOR

1869.

TASMANIA:
PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.

1870.

Contents.

	Page
Proceedings of the Society for March	1
Plant Impressions from Claystone	2
Endogenophyllites Wellingtonensis	2
Remarks on Esparto Grass	2
Dried Shell-fish, &c., from East Coast	3
Printed Records of Early Days of the Colony	5
Proceedings of the Society for April	5
Artificial Fecundation of Ova of Grayling	6
Sheep Fluke, Discussion on	6
Kingfisher, second species of, in Tasmania	7
Proceedings of the Society for May	7
Epthianura albifrons breeding in Tasmania	8
Salpa, Remarks on	8
Aphis on Gum Leaves	8
On the Transit of Mercury over the Sun's Disc, Nov. 5th, 1868	9
Remarks on the Sheep Fluke *(Fasciola Hepatica)*	12
Remarks on the Geological Structure of Part of the North Coast of Tasmania, with special reference to the Tertiary Marine Beds near Table Cape	17
Meteorological and Botanical Abstract for the Autumn Quarter, 1869	22
Proceedings of the Society for June	23
Beet Sugar, Discussion on	24
Proceedings of the Society for July	26
Salmon Trout detained in fresh water	29
Sulphur, Apparatus for applylng, to plants	29
The Manufacture of Beet Sugar in New South Wales. By James Barnard	30
Proceedings oi the Society for August	38
The Growth of Beet-Root and Manufacture of Sugar. By James Barnard	32
Nobert's Test Plate, Moller's Diatom Type Slide, and Modern Mircroscopes By Francis Abbott, F.R.A.S., F.R.M.S.	35
Meteorological and Botanical Abstract for the Winter Quarter, 1869	42
Proceedings of the Society for September	43
Septaria from New Zealand	43
Proceedings of the Society for October	45
Proceedings of the Society for November	47
Gold, &c., from Mangana	47
Salmon Smolt caught in Derwent	47
Microscopical Meeting	48
Net-Fishing in the Derwent. By Morton Allport, F.L.S., F.Z.S.	50
Notes on the Occurrence of Gold at Port Cygnet. By T. Stephens, M.A.	55
The Phyllactidium pulchellum. By E. D. Harrop, F.R.M.S.	58
Meteorological and Botanical Abstract for the Spring Quarter, 1869	61
,, ,, ,, Summer Quarter, 1869-70	63
List of Fellows	72
Minutes of Annual General Meeting	75
Report of Council for 1868	77
Statement of Funds of Society	82
Books Purchased and Presented	83
Presentations to Museum	85
Plants, &c., received at Gardens	88
,, sent from Gardens	88
,, supplied to Public Places	89
Plants introduced into Botanic Gardens during the year	90

APR 6 1901

ERRATA.

Page 6.—Sixth line from bottom, for "pieced," read "placed."

Page 12.—First line, for "heptica," read "hepatica."

Page 59.—Twelfth line, for "Eudochrome," read "Endochrome."

ROYAL SOCIETY.

MARCH, 1869.

The monthly evening meeting of the Fellows, the first of the present session, was held on Tuesday, the 9th March, J. Barnard, Esq., in the chair.

The Hon. Secretary (Dr. Agnew) laid on the table the following returns :—

1. Visitors to Museum (February), 887.
2. Ditto to Gardens (February), 1,911.
3. Plants, &c., received at Gardens (February) :—From the Acclimatisation Society, Christchurch, New Zealand, seeds of Areca sapida, and Cordyline indivisa.
   From Mr. C. F. Creswell, 11 packets seeds and 9 species of bulbous plants received from England.
4. Seeds sent from Gardens :—
   To A. Verschaffelt, Ghent, Belgium, one packet of seeds of Areca sapida.
5. Time of leafing, flowering, and fruiting of a few standard plants in Botanic Gardens.
6. Books and periodicals received during January and February.

Meteorological Returns :—

1. Hobart Town, from F. Abbott, Esq., tables for January and February.
2. Port Arthur, from J. Boyd, Esq., table for January.
3. Swansea, from Dr. Story, ditto, ditto
4. Westbury, from F. Belstead, Esq., ditto, ditto and February.
5. Adelaide, South Australia, from C. Todd, Esq., Government Observer, tables for December, 1868.
6. Sydney, New South Wales, from C. R. Todd, Esq., Government Observer, tables for December and January.

The presentations were as follows :—

1. From J. Milligan, Esq., London.
   (a). Seven packages of Tasmanian plants, named by Dr. Hooker, of Kew.
   (b). Two ditto Italian plants.
   (c). Six specimens of *Calymene Blumenbachii* from Wenlock Shale, Gotland
   (d). Specimen of Esparto Grass.
2. From G. Whitcomb, Esq. :—
   (a). Sample of coal from Lambton Colliery, Newcastle, and Bituminous Shale from Hartley, New South Wales.
   (b). Sample of Sugar Cane-grown in Queensland.
3. From G. Krefft, Esq., Sydney Museum, per M. Allport, Esq., five prepared skins of birds from King George's Sound.
4. From Mr. R. T. Dyer, Brighton, an Albino variety of the Rosella Parrot *(Platycercus eximius)*.
5. From the Hon. R. Officer, a White Hawk.
6. A Goshawk *(Astur approximans)*.

7. From S. Hannaford, Esq., specimen of *Sipunculus* from Corio Bay, Geelong.
8. From Captain T. Nichols, Skeleton of a Fish from Howe's Island.
9. From Mr. J. Kelly, One Shilling of Queen Anne, 1707, and a Danish Copper Coin, 1771.
10. From Mr. S. H. Wintle :—

(a). A Vegetable Impression in Shale, from a height of between three and four thousand feet on Mount Wellington *(Endogenophyllites Wellingtonensis.* McCoy.)

(b). A Cluster of Plant Impressions from a Claystone Formation in Patrick-street.

[In reference to this specimen, Mr. Wintle mentioned in his note that he had for a number of years past been in the habit of examining the formation from which it was obtained, whenever he happened to be in the locality, but had not succeeded in finding any trace of organic structure until about three weeks ago, when he discovered several impressions similar to those presented. He also stated that he had sent some to Professor McCoy, who considers them of great importance, and will shortly determine the position they hold in the scale of fossil flora.]

(c). Fragments of Shale, bearing impressions of Cryptogamic Plants from New Town.

(d). Specimen of Pholas sp. from Rocks below Sandy Fay.

(e). Collection of specimens of Coleoptra, &c.

(f). Gall Fly and Nest, also a smaller species, with its Larva.

The Hon. Secretary read notes by Mr. Wintle, on the fossils and other objects presented by him. The recent Pholas, with its perfect syphon, preserved in spirits, and the shell of another embedded in the clay rock, into which the animal had bored to a considerable depth, were examined with interest, as also were the large and small Gall Flies, which produce their characteristic growths on the leaves of the gum and other trees. As to one of the fossils (No. 10, *a*) a letter was read from Professor McCoy, to whom it had been sent by Mr. Wintle for examination, and by whom, as a new species, it had been named *Endogenophyllites Wellingtonensis.*

Mr. M. Allport called attention to the many interesting specimens presented by Mr. Wintle ; and mentioned in reference to the vegetable remains occurring in the clay rock, that similar impressions had been many years ago found by him (Mr. Allport) in vast numbers, in a quarry at the Old Beach, but from the coarser material, the difficulty of assigning to them their correct position amongst fossil flora was very great. Recently, Mr. Allport had found similar remains in a quarry near the Cascades, and that gentleman remarked that if a few more would interest themselves in a strict search, the probability was strong that remains of greater palæontological interest, and which would fix the geological age of the whole of these rocks, might be found. Referring to the wasp's nest presented by Mr. Wintle, Mr. Allport presented a similar nest with the wasp which constructed it, the wasp having been watched at work on the nest, caught and brought to the donor by a boy only five years old.

Mr. Barnard, in continuation of a former paper on the subject, read the following communication relative to the Esparto Grass, and laid on the table a sheet of Esparto paper :—"It may be in the recollection of the Fellows that, at the meeting of the Royal Society which was held on the evening of the 14th July last, on the occasion of submitting some observations on the desirability of acclimatizing the Esparto Grass for the manufacture of paper, with a view to the establishment of a paper mill in Tasmania, I was requested to prosecute the enquiry, and obtain further information on a subject considered of wide importance. Accordingly,

by the July mail I gave effect to my promise of compliance with that request, by placing myself in communication with an eminent commercial firm in London, and soliciting their co-operation in the matter ; and I will now lay before the Society the result of the correspondence up to the present date, regretting, while sanguine of the attainment of ultimate success, that more should not have by this time been accomplished. By return mail, under date 11th September, 1868, these gentlemen write :— 'The short interval between the arrival and departure of the Marseilles Mail, has prevented our obtaining any useful information with regard to the Esparto Grass for the manufacture of paper; but you may rely upon our doing our best to assist you; and we will report, by next mail, the result of our inquiries.' Agreeably to this intimation, on the 9th October I was favoured with the following particulars :—'Esparto Grass.—We learn that 50,000 to 100,000 tons are imported here annually from Spain and the opposite coast of Africa. The last that was sold here fetched £4 15s. a ton, but scarcely any comes in here for sale. The bulk is bought by a company (in which Lloyd is the principal man) who have establishments in Spain, and own or charter ships for bringing in whole cargoes, and have a patent for dressing it here. It seems quite a monopoly, and other importers have discontinued. Under the circumstances, as you will conjecture, it is not easy to obtain information; but we have been able to get a sample of the last sold here, which we send you by this Mail. We are endeavouring to procure through some friends in Spain, a bushel of the seed. If we succeed, we will forward it to you; but it will be some time first.' By the last Mail, under date 31st December, 1868, the same gentlemen write :—'We have not succeeded in getting any further information about the Esparto grass; but we understand that another vegetable fibre—from Africa—is being tested by paper-makers, and promises good results. We will communicate any further information which we may obtain on the subject.' The sample of Esparto grass referred to has been laid upon the table, and the Society will please to receive the information embodied in the foregoing correspondence in the light of a progress report, to be followed up by further information from time to time as it may be transmitted. I present a sheet of paper manufactured from Esparto grass, for which I am indebted to the courtesy of Messrs. William Knight and Co., merchants of the New Wharf, which will enable the members to judge of its quality."

Mr. Justin Browne had seen it stated that this grass was driving rags out of the English market.

Mr. Napier observed that the profit from the grass must be enormous, as its price was but £4 10s. per ton, whilst the value of the paper produced from it was from £40 to £50 per ton.

Mr. F. Abbott read an interesting paper on the late transit of Mercury over the Sun's disc.

The Secretary in laying before the meeting two specimens of the dried mutton fish *(Haliotis sp.)*, prepared by the Chinese at South Port, read the following note from Mr. Justin Browne :—"I send you for exhibition at to-night's meeting some dried Mutton Fish. The shell of this fish is well known as the 'ear shell,' and when living the fish envelopes the shell or nearly covers it, and clings to the rocks with great tenacity. The Chinese pierce the shell with a sort of spear, and the fish being thus paralysed is easily detached from the rock ; it is separated from the shell much as an oyster is, and is then dried in a slow oven built for the purpose, after which the dried fish are packed in casks or cases for export. Before cooking, it is soaked in water for a considerable time. Crayfish are treated in the same manner, and are cured in large quantities."

Mr. W. Knight, junr., exhibited a black powdery looking substance received from Mr Glover, who procured it on the West Coast. It occurs in considerable quantities along some of the freshwater creeks, and on some of the sea beaches and is carbonaceous in character—possibly the remains of firewood used by the Aborigines at their cooking places, where shell and other fish were consumed.

On the motion of Mr. Allport, seconded by Mr. Justin Browne, the thanks of the meeting were given to the authors of papers, and the donors of presentations, especially to Mr. Wintle, for his very interesting contribution.

APRIL, 1869.

The monthly evening meeting of the Fellows was held on Tuesday, the 13th April, T. Giblin, Esq., in the chair.

The following returns for the past month were laid on the table:—

1. Visitors to Museum, 877.
2. Ditto to Gardens, 2,724.
3. Plants, &c., sent from Gardens.
4. Time of leafing, flowering, and fruiting of a few standard plants in Gardens.
5. Books and Periodicals received.
6. Presentations to Museum.

Meteorological Returns :—

1. Hobart Town, from F. Abbott, Esq., Table and Summary for March.
2. Port Arthur, from J. Boyd, Esq., Tables for February and March.
3. Westbury, from F. Belstead, Esq., Table for March.
4. Brisbane, Queensland, from E. McDonnell, Esq., Meteorological Summary for February.
5. Lighthouses, &c., from the Hobart Town Marine Board, Monthly Tables for the half-year ended 31st December, 1868.

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

1. From W. Johnstone, Esq., Trinity Hill, a Boomerang and Waddy from Queensland, a Spear from New Hebrides.
2. From H. M. Hull, Esq., a Key-hole Limpet, and Chiton, from Sandy Bay ; a Magpie Perch.
3. From Mr. F. Holmes, portion of Skin of Whale, tanned.
4. From Mr. G. F. Gooch, a small Silver Coin.
5. From Mr. Mitchell, Sandy Bay, a Basket and Necklace made by Female Aborigines of Tasmania.
6. From Dr. Cox, Sydney, 67 specimens of Shells.
7. From Mr. Hannaford, an Ostracion and 2 seeds of the *Trappa bicornis*, from China.
8. From W. A. B. Gellibrand, Esq,, a Female Specimen of the Native Tiger *(Thylacinus cynocephalus)*.
9. From J. Maclanachan, Esq., a Hen Golden Pheasant.
10. From J. Swan, Esq., Skeletons of Forester and Brush Kangaroo, and 2 Bandicoots.
11. From Mrs. Room, Launceston, an Indian Silver Coin ($\frac{1}{2}$ rupee)
12. From Dr. W. Sonder, Hamburg, Flora Capensis, by Drs. Harvey and Sonder, 3 vols. bound cloth.
13. Tasmanian Industries, by J. E. Calder, Esq. (pamphlet), 2 copies, presented by Her Majesty's Government.
14. Statistics of New Zealand, 1867, presented by New Zealand Government.
15. From E. D. Harrop, Esq., Launceston, Four Mounted Specimens of Fluke *(Fasciola hepatica)*.
16. From Mrs. C. Meredith, Specimen of the Australian Coot (*Fulica Australis*).
17. From Mr. F. A. Moore, Mangalore Farm, Bridgewater, a Copy of *The Derwent Star and Van Diemen's Land Intelligencer*, April 3rd, 1810, containing an account of the death of Governor Collins. Printed Government Orders, January 14th, February 5th, March 2nd, April 5th, 6th, and 15th, 1814. A Promissory Note, value 3d., signed W. Robinson, 1824. [These records of the early days of the Colony excited much attention among the members present.]

The Secretary, Dr. Agnew, read a letter from Baron F. Von Mueller,

intimating that a copy of a work entitled "Flora Capensis," by Drs. W. H. Harvey and O. W. Sonder, had been presented to the Society by the latter gentleman. (See presentation No. 12.) Dr. Sonder also took the opportunity of conveying his thanks for his election as a corresponding member of the Society.

Mr. M. Allport informed the meeting that he had this season successfully stripped and fecundated the ova from the indigenous grayling *(Prototroctes muræna)*. The male and female fish were taken with the rod at the Falls, New Norfolk, during the last week in March. The ova were brought to town and deposited in a slate tray with a gentle stream of water running through it. The embryos first showed in 3 days and hatched out in 8 to 12 days. Unfortunately the delicate little fish scarcely survived the extrusion from the egg more than a few minutes, and were all lost, probably from want of greater depth, or other physical condition of the water, of which we are at present ignorant. The main interest attaching to the experiment is, that it upsets the theory long held by many fishermen that these fish spawn in salt water.

The Secretary read a paper by Mr. E. D. Harrop, of the Bank of Van Diemen's Land, Launceston, on the fluke *(Fasciola hepatica)*. The subject was illustrated by several microscopical preparations (mounted by the author) of the Ova, Ovaries, &c., of the animal, which were examined with much interest by the Fellows present.

Discussion followed, and, after a well-merited compliment to Mr. Harrop, for the care and neatness displayed in the mounted specimens of fluke presented to the Society, Mr. M. Allport observed that Mr. Harrop regrets that he has been unable to prepare any specimens of the Cercariæ of Fasciola hepatica, thereby implying that he has found such Cercariæ; has he done so? and if so, where? Mr. Allport believed that reliable information as to the Cercariæ being found elsewhere than in sheep, would supply a link hitherto missing in the natural history of this fluke. Cobbold expressly states that the life of the liver fluke subsequent to the hatching of the ciliated embryo, and until its re-appearance in the liver of the sheep, is at present unknown, but, that analogy (based on the well-known history of other allied creatures) would lead to the conclusion that the embryo takes up its residence in a molluscan host, and forms sporocysts, the progeny from which ultimately get to the interior of the sheep. Mr. Allport admitted that the probabilities are strong that some other hosts than mammalia were concerned in the development of the liver fluke, but stating that to the best of his belief proof was yet wanting.

Mr. Walter Gellibrand mentioned an instance in which he had known sound ground on which a few fluky sheep were pieced for a few days, to transmit the disease to sound sheep in three weeks, in this case it seems hard to believe that any intermediate host was concerned in the development of the perfect fluke.

A vote of thanks to Mr. Harrop, and to the donors of presentations, closed the proceedings.

MAY, 1869.

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

The following returns for the past month were laid on the table:—

1. Visitors to Museum, 781.
2. Ditto to Gardens, 1,567.
3. Plants, &c., received at gardens.
4. Ditto, sent from gardens.
5. Time of leafing, flowering, and fruiting of a few standard plants in gardens.
6. Books and periodicals received.
7. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for April.
2. Swansea, from Dr. Story, table for April.
3. Westbury, from F. Belstead, Esq., table for April.
4. Sydney, from G. R. Smalley, Esq., Government Observer, table for February.
5. New Zealand, from the Government Observer, tables for January and February.

The presentations were as follow:—

1. From Mrs. C. Meredith, a Coot (*Fulica Australis*).
2. From Hon. C. Meredith, Esq., two specimens of "Silver Fish" from Prosser's Bay.
3. A Kingfisher (*Alcyone azurea*) donor unknown.
4. From T. Stephens, Esq., a Kingfisher (*Halcyon sanctus*), from Southport.
5. From E. D. Swan, Esq., nest and eggs of *Epthianura albifrons*, found at Cornelian Bay.
6. From Dr. Storey, Swansea, skeletons of Eagle Hawk, Crane, Bandicoot, &c.
7. From Mr. A. J. Taylor, New Norfolk, a copper Coin of French Republic.
8. From Mr. Rollings, Sorell, a Jade Chisel from New Zealand. Flint Implement used by Tasmanian Aborigines for skinning Kangaroo, &c.
9. From M. Allport, Esq., Gelatinous tube of Salpa, and small Crustacean found within it. From Adventure Bay.
10. Ditto, found at sea on the voyage from England, presented by Miss S. P. Edwards.
11. From the Hon. R. Officer, Esq., M.H.A., a set of Maps of Geological Survey of Victoria, 1 vol. bound.

Mr. Stephens called attention to a specimen of Kingfisher (presentation No. 4), which he had brought from Recherche Bay, where it was shot by Mr. Collis, and remarked that it was not included by Gould among the birds of Tasmania.

Mr. Swan remarked that he had for some time been aware of the existence of a second species of Kingfisher in Tasmania, and on examining the bird referred to by Mr. Stephens, had no doubt as to its being a specimen of the sacred Halcyon (*Halcyon sanctus*), whose habitat had hitherto been supposed to be confined to the Australian Continent.

With regard to presentation No. 5 (Nest and Eggs of *Epthianura albifrons*) the same gentleman observed that it was interesting, as proving

beyond a doubt that these birds breed in the colony, they having previously been looked upon as mere casual visitors.

Referring to the crustaceans presented (Nos. 9 and 10), Mr. M. Allport stated that his specimen was picked up alive on the beach at Adventure Bay. At first the animal kept itself so pertinaciously within the clear gelatinous cylinder (resembling in shape a small barrel with the ends knocked out), through which it could be distinctly seen moving about, that he took this cylinder to be a part of the animal, probably some extension of the carapace, analagous to that found in the entomostraca, but further observation showed that the enclosed crustacean was quite free of its beautiful envelope, and that it readily protruded its head and anterior limbs from either aperture. The envelope might be the empty case of one of the Salpæ, a family of floating molluscs, many genera of which are common round our coast, and the crustacean either took up its temporary residence in the already empty case or, as is most probable, had first devoured the softer parts of the mollusc and was on the look out for a second victim. Having preserved the specimen, Mr. Allport showed it some time after to a lady (Miss Edwards), who immediately recognised it as identical with one caught by her in a floating dredge on the voyage from England several years before, and which she had preserved. In order to demonstrate that the crustacean in the first specimen had not chosen its crystal-like home by mere chance, but as a part of the regular economy of this curious animal, Miss Edwards had kindly presented her duplicate specimen to the Museum.

Mr. Allport incidentally remarked that many of the Salpæ from the diaphanous nature of their outer covering, would form beautiful living objects for low powers at one of the Society's microscopic meetings.

Mr. Stephens, in bringing under special notice the fossils from Table Cape, collected and presented to the Society by Mr. Hainsworth, gave a lucid sketch of the geological formation of the portion of the northern seaboard of the island, extending from the Tamar to Circular Head. He then noticed in detail several of the specimens, and pointed out their value in a palæontological point of view. Mr. Stephens also referred to the great value which a more complete series would be to the Museum, and was sanguine that Mr. Hainsworth would still pursue his labours in the cause, and enrich the collection with specimens yet to be discovered.

Mr. M. Allport called attention to a branch of Gum (*Eucalyptus sp.*), kindly forwarded by Lady Dry, the leaves of which were coated with a purple powder, resolving itself, under the microscope, into myriads of eggs of some insect, now rapidly hatching, and probably belonging to the Aphides. Under the low powers of the instrument the brilliant colours of the egg-cases elicited much admiration.

The Chairman (Mr. Allport) after the proposal of the vote of thanks to the donors of presentations, and to Mr. Stephens, for his able remarks on the geology of the North Coast, called the attention of the meeting to one fact, that fixed the geological age of the raised beaches at Table Cape at about the same as the Travertine of Geilston Bay, though one was of marine, and the other of fresh-water origin, viz., the presence in each of bones of existing animals, as evinced by the Wallaby skeleton obtained from the coast formation by Mr. Wm. Archer, and the bones of the Dasyuri, Phalangistæ, and Permales, obtained by himself from Geilston.

After some conversational discussion, the thanks of the meeting were accorded to the donors of presentations, specially to Mr. Hainsworth for his valuable contribution, and to Mr. Stephens for his interesting address.

The meeting then terminated.

ON THE TRANSIT OF MERCURY OVER THE SUN'S DISC, NOV. 5TH, 1868.

By Francis Abbott, F.R.A.S., &c.

I lay on the table a diagram in which is embodied the elements, and a full explanation, of the transit of Mercury, with the true path of the planet over the sun's disc on the 5th of November, 1868. The observations were made with a five foot equatorially mounted achromatic telescope. Other observations were also made at the time, and near the same place, with a small Gregorian reflector. The day was fine, and the passage of the planet over the sun's disc was observed as a well-defined round black spot. When the true limb of the planet reached the true limb of the sun, the light being cut off, a fine dark ligament appeared to connect the limb of the planet and the sun, showing the true time at first contact.

The Hobart Town time of transit was computed from the Nautical Almanac; the observations made with a half second chronometer, and when compared with the normal clock it was found to be remarkably close, I scarcely think one second in error.

The sun's limb was well defined, and the tremor by no means considerable. Some measures were made of the difference of right ascension of the Sun and Planet, they have been corrected for refraction, and for the motion of the sun, and are compared with the elements given in the nautical almanac, as shown in the diagram. In the observation I saw neither central bright spot, halo, nor satellite. My attention was directed to time determinations for ascertaining longitude, rather than to any peculiarities that might be presented during the transit.

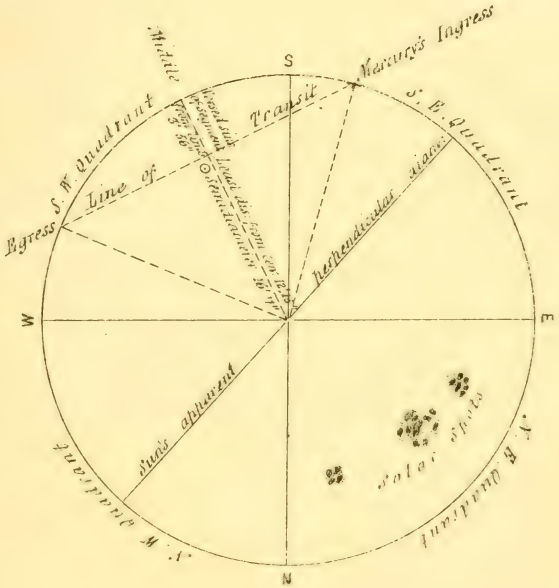
The Royal Astronomical Society are in full possession of all the means employed by Commander Kay for determining the geographical position of the Magnetic Observatory here, the whole series of observations consisted of moon culminating stars, of which 41 sets from both limbs of the moon were observed on the meridian, with an excellent transit instrument by Troughton and Simms. The solar eclipses, and the eclipses of Jupiter's satellites were observed with a telescope made for the purpose by Jones. When the distance of any two given places is not very great, the longitude is determined with accuracy by transmission of chronometers, for which purpose Captain Kay availed himself of the well known positions of the observatory at Parramatta and Fort Macquarie, Sydney Harbour; by this method no less than 76 chronometers were

employed, independent of 110 astronomical observations, and a triangulation. The whole of these observations were made from the year 1843 to 1846, and in order to obtain the corresponding observations of the moon culminating stars, previous arrangements were made at Greenwich, Edinburgh, Cambridge and Oxford. The lunar observations were afterwards placed in the hands of Mr. Riddle, head Mathematical Master of the Nautical School at Greenwich, for reduction, and the whole series were reduced, and a paper drawn up from the results by Captain Shadwell, for the Astronomical Society, which gave for the longitude of Hobart Town, 9h. 49min. 29·6 secs.

Since the time this result was arrived at Captain Denham, when stationed at Garden Island, sent an officer into these waters for the purpose of confirming the longitude of Hobart Town. The mean result of all observations made at that time, gave for the longitude 9h. 49m. 28·8s. being a small difference of (0·8)—eight-tenths of a second. There remains, however, still much doubt as to the correct geographical position of any of the Australian colonies being correctly known. Captain Kay thinks with the Astronomer Royal, that for observing the forthcoming Transit of Venus, in December 1874 and 1882, they are not suited until better known. Mr. Ellery thinks differently, he considers the longitude of the Melbourne Observatory as well known as that at the Cape of Good Hope. The Sydney Astronomers believe the longitude established at Fort Macquarie, Sydney Harbour, and at the Observatory, Parramatta, by the late Sir Thomas Brisbane, assisted by his computer and observer, Mr. Rumker, and Mr. Dunlop, to be the best known of any in these colonies. The authorities for the establishment of the longitude of Fort Macquarie, Sydney Harbour, and the chronometrical differences of meridians employed in the determination of the longitude for Hobart Town, from them, were very numerous.

The determination of the latitude of any place is a much simpler problem ; the latitude obtained by Captain Kay,was the result of sextant observations by the method of circum-meridional altitudes of the sun and stars. In their reduction, Baily's Tables and Formulæ of reduction to the meridian, and Ivory's Tables of refraction, with their correction for pressure and temperature were used. Captain Kay thinks that the latitude assigned to the observatory cannot be much in error. If we consider the number of observations made and the large amount of labour bestowed upon them, the authority connected, and the result obtained, we have an equal right to consider the geographical position of Hobart Town, as correct as any of the Australian colonies. In all probability not one of the

TRANSIT OF MERCURY
OVER THE SUN'S DISC
NOVEMBER 5TH 1868



HOBART TOWN TIME OF INGRESS $3^{h}.14^{m}.9^{s}$ P.M.

" " " EGRESS $6.52.27$ "

W.C. Piguenit, del. F. Abbott

Survey Department, Hobart Town

ten principal observers engaged at the transit of Venus in 1769 had a fixed position more correct than that at Hobart Town.

The re-discussion of the transit of Venus in 1769 recently made by Mr. Stone, at the Greenwich observatory, from results of all observations made at the time, has reduced the sun's distance to near that arrived at by the opposition of Mars, and the speed of light, viz., 91,700,000 miles. This great problem therefore may be considered almost settled within the requirements of our present astronomy, and only waits for confirmation at the next transit of Venus to make all things accordant. This necessity is more felt owing to some doubt having arisen on a misinterpretation said to be made by Mr. Stone, in his re-discussion on Chappe's statement made at the time of contact of the sun and Planet, and the circumstance of Pauly having left his telescope before the last contact.

This question of the correct geographical position of these colonies therefore, is a problem that will require to be settled before the time arrives for ascertaining the true value of the solar paralax.

There is a great uncertainty of any expedition being able to reach either Wilks Land or Sabrina Land in the month of December. In all probability the Australian colonies will be made the southern limit of observation. If, therefore, some well-defined spot is fixed upon in the interim, and suitable means employed to establish it as a starting point for determining the correct geographical position of any other spot with equal accuracy, either by telegraphic communication or transmission of chronometers, several different stations could be either confirmed or corrected for the reception of any number of expeditions that might be sent to these colonies.

REMARKS ON THE FLUKE (*FASCIOLA HEPTICA*).

By E. D. Harrop, F.R.M.S.

Having lately had an opportunity of examining and dissecting specimens of Fluke, and in consequence having had to refer to some of the literature extant relating thereto, I venture to lay before your learned Society a few remarks, bearing more particularly on the generative organs, and reproduction of this parasite.

I beg to offer for examination by the Members, preparations as follows:—

Slide No. 1. *Fasciola hepatica*, taken from liver of sheep killed in the Midland District, showing oral and ventral suckers.

Slide No. 2. Portion of uterus, with eggs packed in situ.

Slide No. 3. Eggs of *Fasciola hepatica*.

Slide No. 4. Same; with operculum off, and vitelline contents extruded, also showing filamentoid spermatozoa.

These parasites are perfectly hermaphrodite. Their generative organs are well understood, and in proportion to the size of the animal, the extent and complication of these organs are astonishing. The male apparatus, the uterine cavity and oviduct, the yelk forming glands, occupy by far the greatest portion of the body.

Siebold says, "the female apparatus of the trematodes consists of a germ forming organ (ovary), with its excretory duct; then two others for forming the vitellus, which have also excretory ducts, and then a simple uterus with its vagina. The male apparatus consists of testicles with their excretory canals, an internal seminal vesicle, a cirrhus-sac, an external seminal vesicle, and a penis."

This simple and concise description fails to convey a sufficiently enlarged idea of the beautiful arrangement and extent of the organ devoted to reproduction in the species under consideration. The whole circumference of the body just beneath the skin is occupied by the ovaries, from these oviferous canals arise, and uniting on each side of the body, convey their contents into the large oviducts which terminate in the uterus. The male apparatus takes up the centre of the body. The testes, consisting of a great number of small and much convoluted vessels, terminate in two large tubes which convey the spermatic fluid to the vas deferens, which becoming attenuated, terminates at the root of the penis.

The uterus consists of a tortuous tube filled with eggs. A portion of the uterus is shown in preparation No. 2. The eggs

are of a yellowish color, have an operculum, and are found in vast numbers in individual specimens of the entozoon. Slides Nos. 2 and 3 exhibit the eggs as taken from the uterine tube, and on slide No. 3, near some of the eggs, are to be seen some spermatic filaments.

Alternate generation is the term applied to the various transformations these entozoa undergo in the course of their full development. There is a missing link in some of the stages, but sufficient is known for a thorough comprehension of the subject. The eggs being formed by the elaborate and beautiful reproductive system above described, escape from the uterus one at a time, and when perfectly mature the operculum is pushed off by the energetic action of the ciliated embryos within. An examination of slide No. 3, will show embryos (unfortunately not sufficiently advanced to exhibit cilia) amongst the extruded vitellus. In some cases these embryos make their escape whilst the egg is within the uterus, but more frequently they escape whilst the egg lies on the marshy or moist pastures. According to Siebold the development of the egg is as follows :—" After the disappearance of the germinative vesicle, large transparent embryonic cells appear in the midst of the vitellus, which undergo fissuration. These multiply by division, increasing at the expense of the vitellus, which in the end they completely replace. When this has taken place there is a mass of extremely small cells, which being covered with a delicate epithelium having cilia, form a round or oval embryo." The ciliated embryo can progress in moist grass or water, and, sooner or later, attaches itself to the surface of the body of some mollusk, most commonly the limneus, planorbis, or paludina, when it loses its ciliated epithelium and gains access to the interior of its host. When there the germ bud contained in the embryo developes rapidly into a non-ciliated larva, within which another family is developed. The enlarged larva is now transformed into a cyst, and is then called a " nurse," and its contained family develope into cercariæ. These cercariæ have an independent life of their own, and it is not absolutely necessary to their existence that they should enter the viscera and liver of a vertebrate, but when there, they meet their highest form of development in the mature liver entozoon. I regret much that I have not been able to prepare specimens of the cercariæ, but when I do so I will forward some for inspection.

Let us recapitulate these powers of reproduction, commencing with the full-grown fluke :—In each individual a vast number of eggs are matured, and each one of these eggs contains a ciliated embryo, capable, after entering a molluscan host, of developing into a non-ciliated larva ; this larva

undergoes further development, has a considerable progeny of its own, which escape and are known as cercariæ ; here follows under certain conditions, a separate existence not fully traced out, but each cercariæ can enter the viscera of a vertebrate, when, in the liver, it attains its final development in the full grown and sexually mature fluke. Let preparation No. 2 (in which only a portion of the uterus is shown) be examined under the microscope, and the number, and dense packing of the eggs be observed, we shall then be astounded at the capabilities of increase made manifest, and no longer wonder at the rapid spread of this parasite.

From this knowledge of the reproduction of the fluke, we may fairly deduce the following conclusions :—

First. That the immediate progeny of the Fasciola is innocuous to vertebrates, for certain metamorphoses or alternations of generation must be passed through before it can develope into the mature animal.

Second. That the eggs (being provided with a hard shell) having passed out of the Fasciola, may be blown about the country and not develope until they meet with favorable conditions.

Third. That an estate may have the reputation of being perfectly free from fluke and yet the germs may be there in myriads, ready to develope when favourable conditions arise, may be through an overmoist season, may be through increase in molluscan life, may be through subtle influences not yet explored.

Fourth. That on a comparatively dry estate, having the marshes well drained, the disease will never be very serious, unless the seasons happen to be peculiarly mild and moist.

Fifth. That molluscan, or aquatic insect life is necessary to the development of the ciliated embryo, but it is not known how long this embryo can live without moisture ; yet it has been proved that infusorial life generally will bear extreme dessication and yet survive.

Sixth. That the offspring of flukey sheep are not born diseased; but in consequence of the systems of the parents being disordered, the offspring may be more predisposed to attacks of the worm, than those born of healthy sheep.

It is stated in a report on fluke, which recently appeared in the newspapers, that " when once a sheep becomes the host of flukes it is doomed, as the parasite will continue in the liver ducts until the life of the animal be exhausted." This does not appear to be the fact, for I have it not only on the authority of Cobbold, that the entozoon after entering the liver ducts, passes into the biliary outlet, thence into the intestinal canal, and is so expelled ; but also from the observation of practical

flock owners, that when sheep not 'badly flukey' are brought into dry healthy pastures they get round again. And it is also known, that the eggs are not, in most cases, expelled from the uterus until the fluke has passed from its host. Now this knowledge, removes, in some measure, the gloom from the terrible picture of the disease and its results portrayed in the report. The conclusion is almost beyond controversy, namely, given healthy, well-drained pastures and the fluke will disappear in a great degree; although the germs of the disease will always be there ready to spread in any flocks that may be exposed to attack by being placed in conditions favorable to their development.

Good drainage and occasional salt diet appear to be the only remedies known at present; but it is quite possible that certain breeds or crosses may, from having more vigorous systems and better digestive powers, withstand the entrance of the parasite into the tissues better than others.

Perhaps, I may be pardoned if, before concluding, I pass from the scientific side of the subject to the consideration rapidly and curtly, of its politico-economic relations.

The disease and its causes has been well known for the last century. Its internal microscopic structure has certainly, only comparatively recently been elucidated, but all that which relates to its dire effects on sheep, that which tends to irritate or to subdue its prevalence, has been intimate knowledge for a long time. Turning to the first edition of Cuvier, published in 1817, I find, under Les Trematodes, the following:—

"La plus celebre est la douve due foie (*Fasciola hepatica*, Linn), qui est si commune dane les vaisseaux hépatiques des moutons, mais qui se trouve aussi dans ceux de beaucoup d'autres ruminans, du cochon, du cheval, et même de l'homme.

"La douve des moutons se multiplie beaucoup, quand ils paissent dans des terrains humides, et leur occasionne l'hydropisie et la mort."

It is very evident, then, that the disease and causes of its aggravation have been known amongst sheep farmers for a long time. A sheep farmer, understanding his business, must have known well enough that, in taking up his flocks to the marshy lands of the Lake district he was taking them to certain disease; and without the slightest precaution, bringing them down to winter in the warmer country below, was taking as certain means to spread that disease. It may be presumed that some sheep farmers desirous of larger gains, have carried more sheep than their cultivated estates would bear in summer, and that during those months they sent them to depasture on lands utterly unprepared by drainage for their reception. The result was inevitable; for a time greater profits

accrued, but a swift and dire Nemesis overtook those who offended against experience and reason, unfortunately, in many cases, causing the innocent alike to suffer with the culpable. I should not have thought of making these remarks if it were not that it has been proposed to render Government assistance in draining and firing the lands of flockmasters. I venture the opinion, in all deference, that it would be highly improper to render any such aid. The spread of the disease, for the germs are everywhere, has been caused through the cupidity or ignorance of flockmasters. Is it right that the public should pay because they are now suffering the consequences? It is no new thing, no sudden and hitherto unknown visitation, but, on the contrary, we know well its cause, and, therefore, the means of its alleviation. As soon would we think to live unsheltered in the fen country and escape ague, as to keep sheep on marshy grounds and expect them to escape the fluke.

It would be more in accordance with the dictates of political economy to let matters take their course until flockowners found it to be to their interest to study the sheep, its food, and requirements, with the same attention as they would any other animal from which profit is expected. There are times, perhaps, when for the general benefit, a government may resort to special measures, but in such case, whatever pecuniary outlay may be thought requisite should be met by a special tax on those who have caused the evil, either by their avarice, ignorance, or carelessness, and not on the public, who have obtained no benefits but rather absolute harm, the result of mismanaged property, which, although private, should not be used to the general disadvantage with impunity.

REMARKS ON THE GEOLOGICAL STRUCTURE OF PART OF THE NORTH COAST OF TASMANIA, WITH SPECIAL REFERENCE TO THE TERTIARY MARINE BEDS NEAR TABLE CAPE.

By T. Stephens, M.A.

The interesting collection of rocks and fossils recently presented to the Museum by Mr. Hainsworth, of Table Cape, calls for something more than a passing notice, and the occasion suggests a brief consideration of the succession of strata exhibited by the coast section from the Tamar to Circular Head.

Between the Tamar and Port Sorell, the Primary rocks are extensively developed. They consist chiefly of slates, schists, limestones, quartzite, and conglomerates, with a general strike to the N.N.W., and they are to be seen continually recurring with anticlinal and synclinal undulations along the whole line of coast from Badger Head almost to Cape Grim. So little is known of the palæontology of these rocks, that it is impossible to do more than hazard a conjecture as to their relative position or age; but they comprise representatives of rocks which show themselves near the Grampians in Western Victoria forming possibly the base of the Lower Silurian series or even of still older date, and they certainly range in an upward direction as high as Upper Silurian. Slight traces of gold have been found at various points, but there is a singular absence of the dykes and veins of true quartz, and other features which characterise the auriferous slates of similar age in other countries. Still, the absence of all trustworthy indications of the presence of gold in paying quantities has not deterred the "practical digger" from wasting his money and time in prospecting such localities as the head of Middle Arm on the Tamar, and even more unpromising spots. Very rich red and brown hæmatites, with other ores of iron, are met with at various points, and notably on the west bank of the Tamar, where they have been fully investigated and reported on by Mr. Gould. Thin veins of galena associated with sulphurets of copper and iron, and carbonates of copper, occur near the Leven, and though the surface indications in that particular locality are not encouraging, they may some day be found further inland developed in valuable lodes.

Resting unconformably on these Primary rocks and usually occupying the ancient valleys formed by their elevation are sandstones and shales containing thin seams of excellent coal. They are associated with calcareous beds containing *Spirifera*

Pachydomus and *Producta* in great abundance, with many other well-known Upper Palæozoic fossils. The resiniferous shale or dysodile of the Mersey, has also been proved by Mr. Gould to belong to this series. These coal measures have not yet been recognised as existing West of the Leven, having probably been removed by denudation. They may, however, be met with as the settlement of the land advances southwards from the coast.

The horizontally bedded conglomerates and breccias of very variable character and uncertain age which occur at intervals between Port Sorell and Table Cape appear to come next in geological order, but may belong to the last named series of rocks. They have occasionally been tilted and broken by intrusions of basalt, and perhaps of trap also, but this is less certain. They are chiefly composed of rolled pebbles and angular fragments of the Primary rocks and the plutonic rocks associated with them, and are usually held together by a strong silicious cement. At the mouth of the Inglis this formation is especially interesting. Large angular blocks of granite and porphyry, the former sometimes weighing several tons, together with rolled pebbles of many of the Primary rocks, are here seen embedded in a fine grained mudstone; this being evidently derived from the denudation of some of the softer slates, and deposited as mud on the margin or in the bed of some ancient river or estuary, which occupied a basin with nearly the same principal boundaries as the modern Inglis. These massive blocks of granite and other rocks which are not now found *in situ* within several miles of their present position, I consider to furnish more conclusive evidence of glacial agency in the geological history of Tasmania than I have met with elsewhere, and they strongly corroborate the testimony afforded by the seemingly erratic boulders which occur at various points in the basin of the South Esk. The age of this conglomerate is doubtful. It underlies unconformably the Tertiary freestone, which has been determined by Professor M'Coy to be of Miocene age, and it contains boulders derived from rocks which are certainly not older than the Lower Carboniferous or Devonian period. In the mudstone which forms the matrix of the transported boulders no fossils have yet been discovered, and the chance of finding them is occasionally lessened by the jointing and rude cleavage which sometimes traverses even the hard pebbles of chert, quartzite, &c., contained in it, and almost entirely destroys the traces of original bedding. It is right to mention that some detached portions of conglomerate, apparently belonging to the formation which I am now describing, have some of the peculiar characteristics of the conglomerate which belongs to

the Primary series; but they cannot be separated from the more recent formation without stronger evidence than can be obtained by the passing traveller.

Among the rolled pebbles which line portions of the beach near Table Cape, and have been derived from the disintegration of the conglomerates now under consideration, there have been found from time to time fragments of a hard compact shale, varying in colour from dark brown to dull black, and so closely resembling the so-called "kerosene shale" of Hartley in New South Wales, both in appearance,and behaviour under the simple tests to which I have subjected it, that they may be considered identical. Two specimens exhibiting the chief varieties, have been forwarded by Mr. Hainsworth, who rightly estimates the important results that would follow from the discovery of the original home of this shale, and has already devoted much of his leisure time to the exploration of the surrounding country in search of it, though hitherto without success. The entire absence of all the members of the Carboniferous series from which these waifs might have been derived is an adverse circumstance, and the occurrence of a single specimen would have attracted no attention. But the great difference between this shale and all the varieties of Tertiary lignite, which are common enough in Tasmania, and the discovery at different points of several specimens all identical in character, force us to the conclusion that it is of pre-Tertiary age, and that portions of the series from which it has come, though removed by denudation near the coast line, will one day be found at no great distance inland. The extraordinary toughness of the shale is worth noting. It is easily seen that it would long resist the destructive agencies which have played so important a part in the geological history of this and other countries, and might remain unaltered long after the accompanying sandstones had been ground down and borne away to fill the hollows of adjacent seas.*

I come now to the formation from which the interesting series of fossils now before us has been obtained. It varies in character from a breccia of coarse sand and broken shells to a fine-grained whitish sandstone, which has been used in

---

* The subjoined report of an assay of this shale by Mr. Cosmo Newbery, of Victoria, has since been furnished by Mr. Hainsworth :—

KEROSENE MINERAL FROM NORTH COAST OF TASMANIA.

Burns freely with a yellow smoky flame, leaving a dark reddish brown ash. Contains iron pyrites. When heated in a closed vessel it melts, forming a fragile coke. A sample dried at 212° F. gives the following results :—

Water driven off at 230° F.	1.59
Volatile matter	67.36
Fixed Carbon	25.83
Ash	5.22
	100.00

the district for building purposes. It has been recognised at various points within a radius of five or six miles from the mouth of the river, and in some places shows a precipitous face of nearly 100 feet above high water mark. Although there is no section visible showing the actual contact between these beds and the basalt, which occupies a large extent of the adjacent country, there is no reason to doubt their priority to it; indeed, Mr. Hainsworth has informed me of an instance where basalt is found capping a small isolated hill which I know to have been formed by denudation, and which the basalt could only have reached by flowing in a lava-like sheet from a higher adjacent summit before the denudation had commenced. It is, however, quite possible that the fossiliferous strata represent two distinct periods, and that a portion of those which appear to abut against the basalt without the slightest alteration in character or position, may one day prove to be of more recent date.

The Museum already contains a series of these Tertiary fossils, presented by different donors, but it is surpassed both in extent and variety by the collection now before us. The specimens are for the most part tolerably perfect, but some of the more delicate shells were so injured by pressure upon the decomposing matrix in which they were embedded that they could not be cleaned for purposes of identification, and had to be preserved in their rough state. The collection contains upwards of sixty species of Mollusca, representing the following genera :—*Strombus*, *Typhis*, *Fasciolaria*, *Cancellaria*, *Cassis*, *Fusus*, *Ancillaria*, *Conus*, *Pleurotomaria*, *Voluta*, *Mitra*, *Cypræa*, *Trivia*, *Natica*, *Potamides*, *Turritella*, *Siliquaria*, *Littorina*, *Trochus*, *Dentalium*, *Terebratula*, *Waldheimia*, *Rhynchonella (?)*, *Ostrea*, *Pecten*, *Lima*, *Spondylus*, *Modiola*, *Arca*, *Limopsis*, *Cucullæa*, *Pectunculus*, *Trigonia*, *Chama*, *Cardium*, *Lucina*, *Cyprina*, *Cardita*, *Venus*, *Venerupis*, *Crassatella*, *Tellina*, *Pholadomya*, *Corbula*, with a few others which I have not been able to identify. The Echinida are represented by species of *Cidaris* and *Spatangus*, and there are also two or three species of corals.

Among the shells which are now extinct one of the most noticeable is "*Trigonia semiundulata*" (M'Coy). This shell has not been found elsewhere in Tasmania, but I have seen it in similar formations on the shores of Port Phillip. It is worthy of remark that the recent *Trigonia*, of which we have two representatives, has not been found at all in the Table Cape beds. There is also a good specimen of a *Cypræa*, which is found nowhere else in Tasmania, and seems to be intermediate between *C. eximia* and the recent *C. umbilicata*, both of which are here found as Tertiary fossils. The collection

includes a species of *Terebratula*, a *Trochus*, and a small *Voluta*, which I have not seen before.

There is further evidence afforded by leaf impressions in the sandstone, and fragments of lignite, to connect these beds very closely in geological age with the extensive Tertiary formation in and around Launceston, and on both banks of the Tamar, which I have also ascertained to be anterior to the great outflow of basalt, which extends from near Kerry Lodge to Evandale and the North Esk. They are also thus allied to the freshwater limestone which was formerly quarried in the outskirts of Hobart Town, and that which is still worked on the opposite side of the Derwent. These were described by Strzelecki many years ago, as the highest formation in geological sequence in Tasmania, and his description still holds good, the post-tertiary and alluvial deposits which are common in the basins of modern rivers, and on the existing coast-line, being of course excepted.

The igneous rocks of Table Cape, specimens of which have also been presented by Mr. Hainsworth, are exceedingly interesting, but can only receive a passing notice here. They present every variety from pumice-like scoriæ to fine-grained crystalline diorite, but may be classed under two distinct heads,—basalt and trap. The age of the latter and its exact relations to the sedimentary rocks it is not easy to fix, but a reference to a geological chart of the locality, prepared nearly ten years ago, when I was accidentally detained for two days in the neighbourhood, confirms the theory which I have latterly held of its being more recent than the conglomerate last described. It forms the projecting headland of Table Cape, and rises with a nearly vertical seaward face to a height of 583 feet. It is undoubtedly older than the Tertiary strata, and probably afforded a shelter under the lee of which they were quietly deposited during a long series of years; where, too, they rested undisturbed until the period of the tremendous eruption of basalt, which, breaking through the previously weakened crust at many points simultaneously, elevated a great portion of the land to its present level, and may be said to have closed the geological history of the North Coast.

METEOROLOGICAL AND BOTANICAL ABSTRACT FOR THE AUTUMN QUARTER, 1869.

OBSERVATORY, HOBART TOWN.

Months.	Mean in Shade.		Max. and Min. in Shade		Mean Solar Intensity Black Bulb Insolated.	Mean Terrestrial Radiation on Grass.	Wind.		Rain.		Total Evaporation exposed to open Sky.
	Pressure. — Barometer corrected to 32°.	Mean Temperature of Air.	Maximum of Air.	Minimum of Air.			Prevailing Currents.	Force.	No. of Days.	Total Amount collected.	
	Inches.	°	°	°	°	°		lbs.		In.	In.
March ..	29·916	59·65	72·5	48·5	103·16	46·98	N.W., S.E.	41·10	9	1·58	3·75
April ..	30·019	56·46	66·0	47·0	88·93	45·33	N.W., S.E.	40·95	2	0·50	1.76
May ..	29·983	49·94	58·0	43·0	75·37	40·44	N.W., S.E.	9·36	14	3·07	1·11
Mean..	29·972	55·35	65·5	46·1	89·15	44·25	N.W. S.E.	30·47	25	5·15	6·62

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 an 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 twenty-five years' standard tables are used for obtaining the difference from the average.

FRANCIS ABBOTT, Private Observatory.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, for the Autumn Quarter 1869.

March 12.—Tips of Hornbean commencing to turn yellow.
,, 12.—Coe's Golden Drop Plum ripe.
,, 15.—Seckle Pear commencing to ripen.
,, 17.—Tips of Elm commencing to turn yellow.
,, 22.—Horsechestnut leaves turning brown.
,, 26.—Ash leaves commencing to fall.
,, 28.—Oak ditto.
April 8.—Coe's Late Red Plum commencing to ripen
,, 10.—Chinese Chrysanthemum commencing to flower.
,, 14.—Elm leaves commencing to fall.
,, 22.—Mountain Ash leaves ditto.
,, 28.—Black Mulberry ditto
,, 30.—Seeds of Hornbean ripe.
May 8.—First Medlar ripe.
,, 18.—Coronilla glauca commencing to flower.
,, 20.—Photinia serrulata ditto.
,, 24.—Diosma alba ditto.
,, 25.—Spiræa prunifolia flora pl. ditto
,, 26.—Ailanthus gladulosus leaves all shed.

NOTE.—The Hornbeam was three, Coe's Golden Drop Plum twelve, Horsechestnut three, Oak two, Mulberry two, Medlar two, and Photinia ten days earlier this year than last. Coe's Late Red Plum was seven, Elm two, and Ailanthus two days later. The time of the remainder was the same as last year.

ROYAL SOCIETY.

JUNE, 1869.

The monthly evening meeting of the Fellows was held on Tuesday, 8th June ; T. Giblin, Esq., in the chair.

Mrs. R. Walker, who had been previously nominated by the Council, was, after a ballot, declared duly elected as a member of the Society.

The Secretary, Dr. Agnew, laid on the table the usual returns for the past month, viz.,—

1. Visitors to Museum, 596.
2. Ditto to Gardens, 1009.
3. Plants. &c., sent from Gardens.
4. Time of leafing, flowering, &c., of a few standard plants in Botanic Gardens.
5. Books and Periodicals received.
6. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for May.
2. Port Arthur, from J. Boyd, Esq., table for April.
3. Swansea, from Dr. Story, tables for March and April.
4. Melbourne, from R. L. Ellery, Esq., table for April.
5. New Zealand, from the Government, tables for March.
6. Brisbane, from Queensland Government, tables for March and April.
7. Sydney, from G. R. Smalley, Esq., tables for February and March.
8. Westbury, from C. Belstead, Esq., table for May.

Also the following reports from the Government of Victoria :—

1. Report of Mining Surveyors and Registrars, Victoria, for quarter ending 31st March, 1869.
2. Report of Registrar-General, Melbourne (Vital Statistics), for quarters ending 31st December, 1868, and 31st March, 1869.

Registration of imported live stock for same period.

The presentations were as follows :—

1. From J. Hull, Esq. A Falcon *(Falco melanogenys)*.
2. From J. Maclaine, Esq., Clarke's Island, *per* Mr. M. Allport. An Avocet *(Recurvirostris rubricollis)*.
3. From Mr. R. Ransome, Southport, *per* T. Stephens, Esq. A specimen of Felspar Porphyry, and the Ear-bone of a Whale.
4. From the Seymour Coal Company. Slab of Shale with numerous plant impressions, from Seymour Mines. A specimen of Coal from West Wanganui Inlet, New Zealand.
5. From Mrs. Stagg. Eight Limestone Fossils (Tasmanian).
6. From P. Ferguson, Esq,, of the *Ceylon Observer*, *per* Mr. Langley, A Letter of the Chetty Merchants (Tamils) of Southern India and Ceylon, with an explanatory note.
7. From Mrs. Ransly. A Lizard with double tail.
8. From Mr. S. H. Wintle. Seventeen named specimens of Tasmanian Coleoptera, with note.
9. From J. Maclanachan, Esq. A Pheasant (a cross between English and Chinese breeds).
10. From R. L. Holmes, Esq. Transactions and Proceedings of New Zealand Institute, vol. 1.
11. From W. A. B. Gellibrand, Esq. Seventy-nine Photographs of Machinery in the Leeds Exhibition.

[These Photographs were presented to the donor by H. Denny, Esq., Secretary of the Leeds Literary and Philosophical Institution.]

Mr. M. Allport wished to take the present opportunity of remarking that he had recently seen in the *Student*, for December, 1868, a paper on the Salpæ, which confirmed him in the opinion he had hazarded at the last meeting in reference to the occurrence of a small Crustacean in the empty case of one of these animals.

Mr. Barnard laid upon the table a small specimen of fine crystal Sugar, manufactured from Beet-root, which had been taken from a sample of 28 lbs. exhibited at the late Agricultural Show held in Sydney, and read a paper upon the subject.

The Chairman remarked that he thought the thanks of the society were justly due to Mr. Barnard for bringing the matter before the meeting. He was certain it would be of great importance to the colony if the manufacture of beet sugar could be introduced, although at first perhaps only on a small scale, and by private individuals with simple apparatus, as described in the paper just read. In former years he had considerable experience in the growth of beet root, and was satisfied that this climate was peculiarly favorable for it. He could not indeed imagine why it was not more extensively cultivated, as it was a hardy plant, easily managed, and superior in almost every respect as a nutritive root crop to the mangold wurtzel. The produce of the two he thought would be about equal in weight, as the beet could be planted much closer than the mangold.

Mr. Morton Allport moved a vote of thanks to Mr. Barnard for his interesting paper, expressing his opinion that it was a pity gentlemen who had left the colony, and who had an opportunity of observing what was doing in other colonies, did not take some interest in the matter, as Mr. Barnard was doing, and forward reliable information upon the subject. There could be no doubt it would be to the advantage of the colony.

In reference to the subject, Mr. Napier recollected that some time ago a quantity of sugar from Sydney was placed in this market, but as it was somewhat peculiar in appearance, it did not command a ready sale; when tried, however, it was found to be so excellent for jams and general household use that it was all quickly bought up. Subsequently it was found that the sugar originally came from France, and was made from the beet root. He had great pleasure in seconding Mr. Allport's motion.

Mr. Davies was sorry more attention was not paid to the manufacture of sugar. It only required a little energy. If it could not be undertaken in the large and profitable manner recommended in the pamphlet issued by Government, it ought at least to be tried by means of the simple and inexpensive process seen by Mr. Barnard in action near Sydney. If this was seen to succeed in a single instance, no doubt many would engage in the process, and in time it might become a matter of considerable national importance.

Mr. Troup (D.A.C.G.), had seen the beet sugar largely produced in Germany, but doubted if in this island it could be manufactured to compete with sea-borne sugar, which was brought so cheaply to our doors. In America the Maple sugar could only be made profitably in the inland region, far from sea carriage. In the event of its being tried, however, he would recommend that the greatest possible care should be taken to procure the best seed, as it was found that the quantity of sugar in the beet varied very greatly according to the sample of seed.

The Secretary remarked that the important point to be determined was the price per pound at which the sugar could be produced by the simple process just described, and suggested that Mr. Barnard would be kind enough to procure from his friend precise information on this point. In reference to the value of beet sugar, in comparison with that of the imported, it was to be recollected that the refuse from the manufacture formed excellent food for cattle, &c., and being always saleable would be a set off in favor of the farmer.

Mr. Barnard expressed his great willingness to obtain the required information, if possible in time to lay before the next meeting.

Further discussion ensuing, the general feeling of the Fellows present appeared to be if the manufacture of the sugar could once be instituted, that the example would generally be followed. In order to promote this object, it was resolved that the Society should suggest to Government the propriety of offering a bonus for the first sample of a certain quantity, say 56lbs., of sugar produced in Tasmania from the beet.

As it was understood that some plants could be obtained from Mr. R. Walker, it was suggested that the experiment might be tried on a small scale at the Society's Gardens, if the very inadequate amount of labour available there would admit of it.

The Secretary having promised to see the Superintendent of the Gardens on the subject, the vote of thanks to Mr. Barnard, and to the donors of presentations, was accorded, and the meeting terminated.

JULY, 1869.

The monthly evening meeting of the Fellows was held on Tuesday, the 13th July; J. Barnard, Esq., in the chair.

L. R. Castray, Esq., A.C.G., and G. Mace, Esq., who had previously been put in nomination, were, after a ballot, declared duly elected as Fellows of the Society.

The Secretary, Dr. Agnew, laid on the table the usual monthly returns, viz.,—

1. Visitors to Museum, June, 1832.
2. Visitors to Gardens, June, 803.
3. Plants, &c., received at Gardens. From A. Verschaffelt, Ghent, Belgium, 106 varieties of fruit trees, of which 48 arrived alive, 15 doubtful, and 43 dead. From Mr. G. Brunning, St. Kilda, 60 plants. From Mr. J. Harris, South Yarra, 47 plants. From Melbourne Botanic Gardens, 29 plants.
4. Plants supplied from Gardens. To Mr. Brunning, 54 plants, 12 packets seeds.
5. For Burial Ground, Cascade Invalid Depot, 40 cypress plants.
6. Time of leafing, flowering, and fruiting, of a few standard plants in Botanic Gardens.
7. Books and Periodicals received.
8. Presentations to Museum.

Meteorological Returns—

1. Hobart Town, from F. Abbott, Esq., table and summary for June.
2. Port Arthur, from J. Boyd, Esq., table for June.
3. Swansea, from Dr. Story, table for May.
4. Westbury, from F. Belstead, Esq., table for June.
5. Melbourne, from R. J. Ellery, Esq., table for May.
6. Sydney, from G. R. Smalley, Esq., table for April.
7. New Zealand, from Dr. Hector, ditto ditto, and report on meteorology for 1868.
8. Brisbane, from E. MacDonnell, Esq., table for May.

The Secretary read a letter of thanks from Professor Newton, of Magdalen College, Cambridge, for specimens of natural history, and publications forwarded by the Society in December last to the Museum and Library of that institution.

Also one from the Secretary of the Anthropological Society of London for a complete set of the transactions of this Society, presented by order of the Council.

The presentations were as follows:—

1. From Dr. Bennett, a crab, from Sandy Bay.
2. From Mr. J. Young, Howrah, eight specimens of Crustaceans (four Crabs and four Prawns), from Kangaroo Point.

[These Prawns have lately been taken in considerable numbers from the mouths of rock cod *(Gadus sp.)* caught in the Derwent, and it is somewhat remarkable that they have not hitherto been found in any other situation.]

3. From Mr. J. Townsend, specimens of Calcareous incrustation round roots of trees, from Sandy Beach at Pittwater.
4. From Mr. W. Johnston, a large seed of tree said to have been taken from the stomach of a Barracouta. Four Coins and one Brass Token.
5. From Mr. Whitely. Silver Coin, value 10 cents, Netherlands, 1849.
6. From Mr. S. H. Wintle. Specimen of Cleithelepis, from New South Wales, discovered by the Rev. W. B. Clarke. A Mineral specimen from a vein in the Mudstone, Huon Road.
7. From Mr. H. Hull. A Malay Kris.

8. From L. R. Castray, Esq., A.C.G. A letter written in the New Zealand language, with translation. [This letter, addressed by one native to another, was picked up near Taranaki.]

Six specimens of Woods from Madagascar, with Botanical, French, and Native names attached.

The attention of the meeting was directed to presentations of books to the table, from the Royal Geographical Society, Royal Asiatic Society, Linnean Society, Geological Society, Zoological Society of London, and Royal Institution of Great Britain.

Mr. Barnard read a paper on the Esparto grass, supplementary to his former observations on the same. From information referred to in the paper, it was evident that the cultivation of the grass could not be attempted in the colony with any chance of success.

After some discussion of a conversational character, votes of thanks were accorded to Mr. Barnard, and the donors of presentations, and the meeting terminated.

AUGUST, 1869.

The usual evening meeting of Fellows was held on Tuesday, 10th August, J. Barnard, Esq., in the chair.

The Secretary, Dr. Agnew, laid on the table the usual returns for the past month, viz. :—

1. Visitors to Museum, 707.
2. Ditto to Gardens, 1251.
3. Plants and seeds sent from, and received at, Gardens.
4. Times of leafling, flowering, and fruiting of a few standard plants in Botanic Gardens.
5. Books and Periodicals received.
6. Presentations to Museum and Library.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for July.
2. Westbury, from F. Belstead, Esq., table for July.
3. Port Arthur, from J. Boyd, Esq., table for July.
4. Melbourne, from R. J. Ellery, Esq., table for June.
5. Sydney, from G R. Smalley, Esq., table for May.
6. New Zealand, from Dr. Hector, table for May.
7. Perth, Western Australia, from W. H. Knight, Esq., table for June.

The presentations were as follows:—

1. From F. Aubin, Esq., a Sun Fish (*Orthagoriscus sp.*), washed on shore at Spring Bay.
2. From Mr. W. J. Thomas, a large specimen of "Native Bread" (*Mylitta Australis*) ploughed up at Bellerive. [This specimen weighed 21lb. 10oz.]
3. From Mr. J. Rossitor, specimens of the Maori Hen of New Zealand. An English Partridge. Three Bones of Foot of Moa *(Dinornis sp.)*
4. From Mr. H. Hull, three Small Fish from Derwent.
5. From H. Bilton, Esq., Glenorchy, double Head of Calf. [This specimen has two perfect mouths, and four eyes, but only one pair of ears. The Calf from which it was taken lived three days, and the cow which produced it had one on a former occasion with three legs.]
6. From Dr. Cox, of Sydney, a large number of Shells.
7. From Mr. J. Jones, a small Turtle from Lady Elliott's Island.
8. From J. Barnard, Esq., a package of Seed of Sugar-beet for distribution.
9. From the Institution of Engineers in England, a complete Set of the Transactions of the Institution, in eleven volumes.
10. Specimens of new species of Helix (*Helix Allporti.* Cox.)
11. From Mr. Roblin, a Black Cockatoo *(Calyptorhynchus xanthonotus)*.
12. From Mr. Gates, Jerusalem, ditto.
13. From Miss S. A. Manley, four specimens of *Chamostrea*, from Carlton Beach.
14. From Miss S. P. Edwards, eleven copper Coins and Tokens.
15. From J. A. Youl, Seventh Annual Report of Inspectors of Salmon Fisheries, England and Wales.
16. From Rev. R. E. Dear, specimens of laminated quartz and iron ore, a number of flint implements of the Aborigines, collected by Mr. Rollings, of Forcett.
17. From J. Barnard, Esq., specimens Cinnabar Ore, from the Cudgegong, New South Wales.

The Secretary announced that it had been decided by the Council to hold the annual microscopical meeting on Tuesday, the 16th November, when it was hoped that every Fellow possessing an instrument would take part in the exhibition; and, in the meantime, endeavour to procure

new and suitable objects, so as to render the meeting as attractive as possible.

Mr. Barnard read some notes on the cultivation of the Sugar Beet, supplementary to a former communication on the same same subject, and took the opportunity of presenting a package of the seed for distribution; also, a small tract on "The Sugar Beet, its importance, cultivation, and management," by Jules Joubert, Secretary to the Agricultural Society of New South Wales.

Mr. Davies suggested that a portion of the seed should be sent to Dr. Coverdale, who he believed was now giving the growth of Beet a fair trial on the farm of the Queen's Orphan Asylum. As Dr. Coverdale was now making use of seed sent from Europe by Mr. John Walker, he would thus be enabled to institute a comparison between the seeds.

Mr. Morton Allport called the attention of the Fellows to an interesting scientific fact, connected with the Salmon experiment, viz., that the few pairs of Salmon trout (*Salmo trutta*) which were retained in a freshwater pond, purposely prepared for them, had deposited spawn in which the embryo fish were now distinctly visible. The parent fish were hatched in May, 1866, and are therefore nearly four years old, their weights varying from three-quarters of a pound to one pound and a half.

Mr. Stephens, in bringing under the notice of the Fellows an apparatus for applying sulphur to plants, by means of a common pair of bellows, in a thorough and economical manner, observed that the use of sulphur was now largely adopted in Madeira, where it had quite cured the disease in the vine *(Oidium)* which had been so destructive of late years. Sulphur thus applied would in fact destroy all vegetable blight, which was of a fungoid character (as was the case with the *Oidium*), and would no doubt be efficacious against the fire blight, which for some years had been so prevalent among the apple trees. [The instrument, which is very simple in construction, and could readily be made by any tin-smith, will be exhibited for some time in the Museum.]

Mr. F. Abbott read a paper on Nobert's test lines, Moller's Diatom Type Slide, and recent improvements in the construction of Microscopes; which was listened to with much attention. Mr. Abbott intimated that he intended exhibiting some new Micrometers, and other novel objects of interest on the evening of the Microscopical meeting.

Mr. Davies thought the thanks of the Society were specially due to Mr. Barnard, for the manner in which he had, on more than one occasion, brought the subject of Sugar Beet cultivation under notice, and begged to move accordingly.

Mr. Buckland seconded the motion, which was carried, and the usual vote of thanks having been given to Mr. Abbott, for his interesting paper, and to the donors of presentations, the meeting broke up.

THE MANUFACTURE OF BEET SUGAR IN NEW SOUTH WALES.

By James Barnard.

During my recent visit to New Sonth Wales I bore in mind my connection with the Royal Society of Tasmania, with a view, if possible, to be useful to its interests upon my return, by bringing under notice any important facts that seemed to me to claim its attention.

Accordingly, I lay upon the table a Catalogue of the Intercolonial Exhibition for 1869 of the Agricultural Society of New South Wales, representing the efforts of industry in the various departments of science and art, in addition to the more immediate results of the Society in the application of skill, energy, and capital, to pastoral and farming pursuits. The exhibits were 1708 in number, and none to my mind possessed more attraction than the sample of sugar, 28lbs. weight, manufactured from beet at Summer Hill, near Bathurst. I was courteously favoured with a specimen, which I placed in a phial; and although from the extreme smallness of the quantity it is scarcely worthy of presentation to the Society, still I thought, as coming from the first exhibition of the kind in New South Wales, and as a means of identity to those unacquainted with its quality, it might not prove altogether unacceptable.

Other considerations contributed to fix my interest upon this subject. One was, that the advantages of the growth and manufacture of beet root sugar in Tasmania had been recognised both by the Legislature and the Government, and had led to the wide circulation of a valuable pamphlet throughout the colony in recommendation of this industry.

Another circumstance was, that while staying up in the interior I met a gentleman, possessing a large establishment, who informed me that he grew the beet and manufactured sugar sufficient for his own domestic consumption; and he described to me his *modus operandi* pretty well in the following terms, viz:—

"Sow the beet in soil of medium quality; transplant in rows eighteen inches apart, and twelve inches distant; wash the beet carefully, scraping off all dirt, and remove the heads. Cut up, and press out juice thoroughly, which boil in a copper; then add lime, dredged in until all acidity is removed, as per test paper. Continue to boil until it draws out to a thread; then stop. Take a beurette or funnel to a pin's head point, with a false bottom, perforated. Then place animal charcoal

(shin bone of beef) on the false bottom or shelf within the beurette, and pour the syrup over the charcoal, which is to be beaten up fine, letting it drain through the funnel-head, this will be molasses, the grains of sugar being left on the surface of the charcoal, which scrape off. Then, to dry the sugar, put it into a pan, and place in "water-jacket"; *i.e.*, a square iron box, double, a space of two inches for water on each of three sides; the fourth is the door to one shelf in the middle, and the bottom forming another, on which shelves the sugar is placed, being completed by a closed door. Make a fire of vegetable charcoal on bed of sand, placing in the hot water. Place the "water-jacket" upon it until the sugar is dried. There is a valve on the top for escape of moisture. The object is equal temperature. Thus, sand, charcoal, water, shelves, sugar."

It had been my first intention to try this experiment myself on a small scale before submitting any communication to the Royal Society; but deferring to the suggestion made to me at a meeting of the Council this afternoon, I at once lay the process before the Society for trial, to enable any one willing to test it.

I will only add, in conclusion, that the Agricultural Society of New South Wales has a periodical for the publication of its transactions and correspondence; and that I had the pleasure, through a gentleman, of establishing relations between that Society and the Royal Society of Tasmania in the exchange of its papers. The first supply will, I expect, arrive by the next steamer from Sydney.

THE GROWTH OF BEET-ROOT AND MANUFACTURE OF SUGAR.

By James Barnard.

Acting upon the desire expressed by the Royal Society, on the occasion of my reading a short paper on the manufacture of beet-root sugar, I have been in communication with a gentleman in New South Wales with a view to procure further information, and have now the honour to submit the results.

Accordingly, I have the pleasure to place at the disposal of the Royal Society a small bag of the seed of the Sugar Beet, of the variety known as the White Silesian, and considered to be the best, which I have procured from Sydney; and although the quantity is small, being only enough to sow an acre and a-half of land, it may prove sufficient for the purpose of experiment. Distribution of this seed should, I suggest, be made, as far as it goes, to such persons as take an interest in the subject, and who would engage to sow a patch of ground and register the results.

Very valuable information is contained in a short elementary treatise, on the importance, cultivation, and management of the Sugar Beet, of which I present to the Society two copies that I received from Sydney, and suggest the desirability of its being republished in its transactions *in extenso*.

An article in the accompanying Bathurst *Free Press* will also be found not without interest, as announcing the intention of a gentleman in that district, Mr. J. F. Clements, the successful exhibitor of a sample of the beet sugar at the recent Intercolonial Exhibition in Sydney, to devote his best energies in the prosecution of this most important industry; and I am informed that Mr. Clements has obtained the services of an experienced practical man, in order to put the matter thoroughly to the test.

Connected with these efforts, I have it on the authority of the Secretary of the Agricultural Society of New South Wales, that it is Mr. Clements' intention to publish the full results of his operations in the journal of that Society, which will consequently be available to our agriculturalists in due course, as that publication is now regularly placed upon the table of the Royal Society.

Among the implements and machinery shown at the exhibition before alluded to, in class 201, was exhibit 871 a., Youngman's Patent American Sugar Evaporator and Refiner. The price was £47 10s., and the exhibitor was Mr. Robinson, of George-street, Sydney. It is described as "consisting of

defecating, evaporating, finishing pans, and filters, with furnace, registers, dampers, and chambers, which enable the whole operation, from the strained neutralised juice to the refined syrup, (in which state it is the best possible for granulation), to be carried out in one continuous operation, with a capacity of from 8 to 10 gallons per hour, and with a consumption of fuel exceedingly small."

It must be a source of satisfaction to learn that Dr. Coverdale, the Principal of the Queen's Asylum, has determined to initiate the cultivation of the sugar beet, and its subsequent manufacture, at the New Town Farm; and no better employment could be given to the band of juvenile workers placed under that gentleman's control.

The same enlightened views which led to the circulation in the community of an abridgment of Baruchson's instructive pamphlet, will, doubtless, influence the Government to give encouragement to the proposed experiment, and sanction the purchase of the requisite machinery, to be obtained at such moderate cost, for the different processes of the manufacture.

A few figures here may serve to show the national importance of this useful industry. It appears, then, from *Nowell's Statistics of Tasmania for* 1868, that the annual consumption of sugar in this community averages about 70lbs. per head of the entire population. This makes a total of say 7,000,000lbs., or 3500 tons yearly, and exceeds in value £100,000 sterling. Hence it is apparent that there is ample scope for the most extensive operations, and that no apprehension need be entertained of over-producing this article of prime necessity.

Adverting now to the specific question of cost, which was put to me in reference to the adoption of this as a domestic manufacture upon a limited scale, I have not been able to procure data to show this with sufficient precision; and I apprehend that, after all, it could only be arrived at approximately, as it would evidently vary in almost every family, according to the degree of skill and experience brought to bear in the culture of the root, and its subsequent manipulation.

Comparison with the home manufacture of bread and beer, as well as with the products of the dairy, best illustrates, I think, the question—"Will it pay?" Many people, we know, bake their own bread, and brew their own beer, as well as make their own butter and cheese, irrespective altogether of the mere question of cost, but simply because it suits them to do so, either from living at an inconvenient distance from the usual distributors of these necessaries of life, or from the possession of the requisite means and appliances, or for other reasons. So, with regard to sugar, it might fall in with family arrangements, in some instances, to apply any available

domestic strength to the prosecution of this valuable industry.

Taking up the inquiry, however, upon broader grounds, it may suffice to point out the fact that the beet-root contributes more than one fourth of all the sugar now used in the world, having in many European markets nearly supplanted the sugar-cane, as affording convincing proof of its being a paying industry. Hence, the conditions of success being the same, there can be no reason to doubt that, once introduced into these colonies, the extraction of sugar from beet would soon grow into a staple manufacture of the first magnitude. Much, of course, would depend upon the Legislature, in the recognition of its national importance by sanctioning only such fiscal measures in relation to the undertaking as should have the effect of imparting a direct stimulus and encouragement to this most important manufacture.

NOBERT'S TEST PLATE, MOLLER'S DIATOM TYPE SLIDE, AND MODERN MICROSCOPES.

By Francis Abbott, F.R.A.S., F.R.M.S.

Nobert's Test Plate, as an instrument for trial, is admirably adapted for comparing the quality of object-glasses, supplied by different makers,and every microscopist who possesses a first-class instrument naturally desires to know what it is capable of doing; for when the power and quality of his lenses are known to him, he is convinced it would be only a waste of time to try them further.

One of the most important tests that the properties of a microscope can be tried by is to clearly "resolve" the very fine lines of the frustules of the *Diatomaceæ*. The value of minute *Diatomaceæ*, is, in their surface markings, which are admirable test objects for the higher power of the microscope. This test was first made known by Messrs. Harrison and Sollitt, of Hull, but unfortunately as a standard measure, a great difference exists in the fineness of the markings in specimens of the same species obtained from different localities. In the *Amphipleura-pellucida*, the number of *striæ* range as low as 34, and many specimens present 60, 70, and 80 in 1·1000 of an inch. *Naviculæ-rhomboides*, range between 30 and 50 in 1·1000 of an inch, so that some specimens may be resolved with a 1-5th, a 1-4th, a 4-10th, or even a half-inch objective, while others require a 1-8th, or a 1-10th, or even a higher power. The first of the *Diatomaceæ* on which the lines were seen, was the *N. Hippocampus*, of Ehrenberg, by Pritchard and Queckett, in the year 1841. In 1844, Mr. Sollitt was in London, and showed the lines on the *N. liniata*, of Harrison, to the late Mr. Ross, with a 1-8th of Nachett's; at that time Mr. Ross could not bring them out with a very fine 1-12th he had just finished. This same Diatom *N. liniata*, has an average of about 60,000 *striæ* to the inch, which can now be well seen with a good $\frac{1}{4}$-inch objective.

For the purpose of testing this resolving power of microscopes, F. A. Nobert, of Pomerania, has adopted a method only known to himself, of ruling lines to a known scale of exceeding fineness, so close that physicists have declared it impossible they ever can be seen, and all trials hitherto have resulted in failures to resolve the finer lines of these plates.

Nobert's test is a series of groups of fine lines ruled parallel on thin glass, such as used for covering, and will admit of the focusing of high powers when reversed and secured on the glass slide; different plates contain a different number of

groups, ruled to different scales, some have 30 bands or groups, the coarsest having its lines 1-1000th of a Paris line apart, and the finest being 1-8000th—each group or band being about 1-2000th of an English inch in width, and the whole 30 occupying a space perhaps a little more than 1-50th of an inch.

The plates now most in use have 19 bands, the first or coarsest being ruled to 1-11,240th of an English inch, and the finest to 1-112,668th of an inch. It is a difficult matter for the mind to appreciate such minute divisions, yet it is essential it should conceive them to prepare it for estimating the difficulty of seeing and counting such lines.

Is it possible for human art ever to make an instrument capable of rendering lines 112,668 to an inch visible. Is there anything in the laws of light which renders it impossible to see lines so close, and is it therefore uselesss for the optician to attempt to improve the microscope beyond a certain point? Or, for the naturalist to try any further investigations on the structure of tissues beyond what the present existing instruments have shown. This problem is the exact parallel of that in testing the quality of the telescope for separating double stars. In 1855, Professor Queckett, asserted that "no achromatic has yet been made capable of separating lines closer together than 1-75,000th of an inch." "Mr. Ross found it impossible to ascertain the position of lines nearer than 1-80,000th of an inch." "Mr. De la Rue was unable to resolve any lines on Nobert's test-plate, closer than 1-81,000th of an inch." "Dr. W. B. Carpenter says, that no objective will, probably, ever be able distinctly to resolve lines closer than 1-84,000th of an inch." If these observations are correct, the existence of lines finer than this is a matter of faith rather than sight; there can be no reasonable doubt, however, that lines do exist, and the resolution of them would evince the extraordinary superiority of any objective, or any system of illumination, which would enable them to be distinguished."

The late Professor J. W. Baily, claimed to have seen lines as close together as 1-100,000th of an inch, and Messrs. Harrison and Sollitt of Hull, claimed to have measured lines on the Diatom *Amphipleura-pellucida*, as fine as 120,000, to 130,000 to the inch. R. C. Greenleaf of Boston, and Mr. Charles Stoddard, were well satisfied that they saw the lines 90,000 to the inch, with a Tolles 1-5th, and afterwards Mr. Greenleafe saw the same lines very distinctly with a Tolles 1-12th. Dr. J. J. Woodward, of Washington, states that with mono-chromatic light, and Powell and Lealand's 1-50th, and 1-25th, and 1-16th objectives a Hartnach's immersion No. 11,

and Wales 1-8th with amplifier, he satisfactorily resolved the 29th and 30th bands of Nobert's test plates, the lines of which were 1-83,917 and 1-86,334 to the inch.

Dr. Woodward lately received a Nobert's test plate of 19 bands, the photographs procured from which were lately brought under the notice of the Royal Microscopic Society by the hon. secretary, Mr. Jabez Hogg, the covering glass on this test-plate was too thick for a 1-50th objective, but with all the others he was able to resolve the 17th band, 101,000 to the inch, the 18th and 19th he was unable to resolve. Both Dr. Curtis and Dr. Woodward have photographed the 16th, 17th, 18th, and 19th bands with a Powell and Lealands' 1-25. In these photographs the lines of the 16th and 17th bands can be counted with some difficulty, but the lines of the 18th and 19th cannot.

Dr. Barnard found the counting of the lines to be attended with a great difficulty, in addition to which there is another trouble, the whole width of a band is not in perfect focus at the same time, and the slightest change in focal adjustment renders it extremely difficult to fix, even with the cobweb micrometer, the last line counted.

One way of verifying the accuracy of the divisions of Nobert's test lines, is by counting them in a measured space. If 46 equidistant lines are ruled in the space of 1-2,000th of an inch, the inter-spaces must be at the rate of 90,000 to the inch. An error of one line more or less in counting the whole on such a band, would decide the rate of interspaces to be either 92,000, or 88,000, instead of 90,000 to the inch.

The foot note to Mr. Stodder's paper in the "American Naturalist," deserves notice. Speaking of Dr. Woodward's photographs, the author says, "The first fifteen bands are sharply and clearly resolved into the true lines; the fifteenth band, however, (which is ruled to the 90,000 of an English inch), requires a hand-glass magnifying four or five diameters, to show its lines distinctly." Dr. Woodward gives the following directions for counting the lines in the highest bands that can be resolved. "If a cobweb micrometer is used, the micrometer eye-piece should be firmly clamped in a stand screwed to the table, so that the eye-piece is close to the end of the microscope-tube, but not to touch it, a piece of black velvet being used to complete the connection. The motion of the micrometer-screw now communicates no tremor to the microscope, and all difficulty in counting the lines seen (whether real or spurious) disappears." Still better than this is the following method:—"The microscope being set up in a dark room, as though to take a photograph, and the eye-piece being removed, the image of the

band to be counted is received on a piece of plate-glass in the plate-holder, and viewed with a focusing-glass, on the field-lens of which a black point is marked; as the focusing-glass is moved on the plate from side to side, the black point is moved from line to line. The lines may thus be counted with as much ease and precision as though they were large enough to be touched with the finger."

These photographs support an opinion given by Mr. Wenham many years ago, that the time would come when photography would reveal minute detail much plainer than it can be seen in the microscope. The reason of this is obvious. In photography the object can be illuminated by highly condensed sun-light, which will produce intense black shadows, quite unendurable to the eye, and it was with such illumination that these photographs were obtained with a Spencer 1-12th, and a Tollis 1-5th, *both dry objectives*. Dr. Woodward made five counts of the 19th band, which gave him a mean of 110,820 to the inch. The number, according to Nobert, is 112,668. Dr. Barnard counts for the 15th band 91,545; Nobert 90,074. There is a similar alleged variation in the striation of Diatomaceæ, among individuals of the same species, *Pleurosigma fasciola*, has been specially designated by Dr. Wallich, as very inconstant in its markings, as well as *Pleurosigma strigosum*, *Navicula-rhomboides*, and *Nitzschia sigmoidea*.

With the 1-8th and the 1-12th by Ross, and the 1-20th by Smith, in the possession of the Royal Microscopic Society, and with a 1-8th, a 1-12th, a 1-16th, and a 1-25th, by Powell and Lealand, all dry objectives, on a new 19-band plate, all the bands beyond the 12th seemed imperfect, the lines were not separated. But with a 1-10th and a 1-18th by Hartnarch, of Paris, a 1-16th by Merz, of Munich, and a 1-20th by Nobert, all *immersion objectives*, straight and well-defined lines were separated as far as the 15th band inclusive. Several trials by sunlight proved that the lines were thus rendered more visible, but the immersion objectives maintained their superiority by all methods.

Continental opticians and men of science have been aware of the merits of the immersion system for some years past; and, from its having received so little attention in England, continental makers do not scruple to say that the English no longer take the lead, either as opticians or microscopists.

The advantage claimed for immersion objectives are:—greater working distance between the object and objective, increase of light, and superior definition and clearness in the optical image, which image is obtained by much simpler illumination than that required in using high-power, dry objectives.

In its construction the objective is immersed in water, that is, there is a film of water between the front of the objective and the object, or thin glass covering it. An *amplifier*, is an achromatic combination inserted in the compound body of the instrument, to increase the power of the objective and eye-piece. *Angle of aperture* is the angle in the surface of the front lens, at which light will enter the objective; the greater the angle of the aperture, the more light, and to a certain extent greater resolving power; there is no evidence, however, for the statement that the resolving of test-diatoms and Nobert's test-lines is a question of *angular aperture*, since the 1-12th inch object-glass may have its *angle of aperture* extended to 170 deg., the utmost limit compatible with the reception of rays from any object; nothing is therefore gained in this respect by a reduction of the focal distance.

Before entering upon the investigation of test-objects, it would be well for every microscopist to ascertain the true magnifying powers and properties of his own instrument, English, American, and Continental European makers differ in distinguishing their instruments; each maker has generally his own system. The theoretical power of a microscope is usually measured from an arbitrary standard of 10 inches; thus a one inch is said to magnify ten diameters; a $\frac{1}{4}$ inch, forty diameters. If the standard is taken at five inches, as it is by some, then the power is but one-half as much. The power of the microscope is that of the objective multiplied by that of the eye-piece; if the objective magnifies ten diameters, and the eye-piece ten, the result is one hundred diameters.

In a scientific point of view, and next to Nobert's test plate we have a marvellous specimen of art in Herr Möllers, diatom type slide; this single slide contains over 450 diatoms, the whole are arranged and scientifically classified into four series by Herr Grunow, of Vienna, and within such a compass that the whole can be examined simultaneously with a two inch, objective, and under dark ground illumination they present a singular and beautiful appearance.

There is issued with the slide a "Systematic Catalogue," which admits of easy reference. Thus, there are nineteen objects belonging to the genus Epithemia the same number of Eunotia, five of Merediones, thirteen of Synedra, &c., &c. In the catalogue they are classed in families,—as *Epithemiæ Meridioneæ. Diatomeæ Tabellariæ, Surireleæ, Nitzschiæ Amphipleuræ, Cocconeidæ, Achnantheæ, Cymbelleæ, Gomphonemeæ, Naviculeæ, Isthemiæ, Biddulphiaceæ, Eupodisceæ, Melosireæ*, and *Chaeto-cereæ*. From this it will be easily seen how to

compare the different families together, and how they differ from other groups.

The objects are attached to the covering glass, like Nobert's test lines, which is very thin, so that it allows the use of high powers; both sets of lines on *Navicula Rhomboides* are resolved with a one-twentieth objective, so that each Diatom may be separately examined with deep lenses. The thickness of covering-glass required for focusing under high powers will explain the difficulty of using them. For a 1-12th and 1-16th objective the covering-glass must not exceed ·004 in. For 1-20th, 1-25th, and 1-50th, ·005 in. It was my intention to have shown Möller's Diatom Typen Plate, and Nobert's bands of Test Lines, under the microscope, at the annual soirée which the Council have fixed for the 16th of November, but from a correspondence by the last mail, I learn that they are not to be had, except at a very great price. I have received, however, from members of the Royal Miscroscopic Society, some specimens of diamond writing, &c., equally marvellous and interesting, and much better suited for the purpose, which were engraved and exhibited at the International Exhibition, class 13. The following is a specimen: —"A micrometer with divisions of 1-100th, 1-1,000, 1-2,000th, 1-4,000th of an inch, with 40 parallelograms, each of 1-100,000th of an inch; 40 parallelograms each of 1-200,000th of an inch; 80 parallelograms each of 1-400,000th of an inch; 200 parallelograms each of 1-2,000,000th of an inch; 400 parallelograms each of 1-4,000,000th of an inch; and 400 parallelograms each of 1-8,000,000th of an inch; with squares of 1-10,000th of an inch; 100 squares each of 1-1,000,000th of an inch; 100 squares each of 1-4,000,000th of an inch; and 400 squares each of 1-16,000,000th of an inch. The Lord's Prayer, the Creed, God Save the Queen, Rule Britannia, a geometric coil, the 4,137 letters in the 51 verses of the 1st Chapter of St. John, a poem upon the International Exhibition, from copper plates engraved in the Exhibition, each in a space from 1-1,600th to 1-2,000th of an inch. A Freemason's sign, which can be covered by a pin's point, &c.

There are various means employed for measuring these delicate objects, the best is undoubtedly the position micrometer, the same as the one used with the telescope for measuring the distance and angle of double-stars; but this instrument is both expensive and complicated. The method now in general use is the micrometer eye-piece, this is an eye-piece either positive or negative, having a divided glass micrometer fitted into a brass frame and placed in its proper focus. If the positive eye-piece is used, the micrometer is placed below the field-glass, but if the negative eye-glass is

used, then the place for the micrometers is between the two lenses.

To find the value of the lines in the eye-piece micrometer, a glass micrometer is laid on the stage of the microscope, which is divided into 1-100th and 1-1000th of an inch, when the two micrometers are brought into focus with a low power, say a one inch objective, then if every division of 1-100th of an inch in the stage micrometer coincides with ten in that of the eye-piece, it is clear that the lines in the eye-piece micrometer are 1-1000th of an inch, the stage micrometer can now be removed, and every object corresponding to the eye-piece micrometer, under a one inch object glass can be measured to 1-1000th of an inch.

If one of the 1-1000th of an inch of the eye-piece micrometer be divided into four parts by the stage micrometer then every one of these divisions would be 1-4000th of an inch. If with any other power it is found that 1-1000th of an inch on the stage micrometer coincides with ten spaces of the eye-pieces micrometer, then the value of each division in the eye-piece micrometer would be 1-10,000th of an inch. In practice it will be found when high numbers are being observed, and the stage movement too coarse, it will be necessary to use the small milled-head screw at the end of the eye-piece micrometer, so as to bring the lines in each micrometer accurately over each other.

For the information of those who take an interest in this subject, I lay on the table the two volumes of Professor Smith's Synopsis of British Diatomaceæ. In these volumes all the objects are drawn to a scale of 10,000 to the inch, multiplied 400 diameters. Also papers containing some particulars of Möller's Diatom Typen Plate, and Nobert's Band of Test Lines, with Mr. Webb's description of diamond writing and engraving.

METEOROLOGICAL AND BOTANICAL ABSTRACT, FOR THE WINTER QUARTER, 1869.

OBSERVATORY, HOBART TOWN.

Months.	Mean in Shade.		Max. and Min. in Shade		Solar Intensity Black Bulb Insulated.	Min. Terrestrial Radiation on Grass.	Wind.		Rain.		Total Evaporation exposed to open Sky.
	Pressure. — Barometer corrected to 32°.	Mean Temperature of Air.	Maximum of Air.	Minimum of Air.	Max.		Prevailing Currents.	Force.	No. of Days.	Total Amount collected.	
	Inches.	°	°	°	°	°		lbs.		In.	In.
June ..	29·956	48·82	65·0	30·0	91·0	30·5	N.W.	27·57	9	1·55	1·32
July ..	30·032	49·15	62·0	33·0	88·0	30·0	N.W.	22·62	9	1·20	1.40
August..	29·862	51·09	72·0	34·0	102·0	29·0	N.W.	65·31	13	2·35	1·71
Mean..	29·983	49·68	66·3	32·3	93·6	29·8	N.W.	38·5	31	5·10	4·43

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 an 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 twenty-five years' standard tables are used for obtaining the difference from the average.

FRANCIS ABBOTT, Private Observatory.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, for the Winter Quarter 1869.

June 10th.—Early Narcissus commencing to flower.
,, 12th.—Maclaura aurantiaca leaves commencing to fall.
,, 14th.—Privet leaves shedding.
,, 15th.—Snow Flake commencing to flower.
,, 30th.—Leaves of Black Mulberry all shed.
July 1st.—Arbutus unedo in flower.
,, 10th.—Garrya elliptica ditto.
,, 12th.—White Mulberry commencing to leaf.
,, 15th.—Almond in full flower.
,, 20th.—Yellow Crocus in flower.
,, 24th.—White Hyacinth ditto.
Aug. 6th.—Sambucus niger commencing to break.
,, 10th.—Common Horsechestnut ditto.
,, 15th.—Elm commencing to flower.
,, 20th.—Poplar commencing to break.
,, 22nd.—Apricot commencing to flower.

NOTE.—The Privet was 4 days, Almond 2 days, Crocus 10 days, Hyacinth 7 days, Elder 6 days, Horsechestnut 5 days, Elm 11 days, Poplar 8 days, and Apricot 8 days *earlier* this year than last. The Maclaura aurantiaca was 2 days, Arbutus 10 days, Garrya elliptica 4 days, and White Mulberry 4 days *later*.

ROYAL SOCIETY.

SEPTEMBER, 1869.

The monthly evening meeting of the Fellows was held on Tuesday, the 14th September, James Barnard, Esq., in the chair.

Mr. M. Allport, in the absence of the Hon. Secretary, laid on the table the usual returns for the past month, viz.:—

1. Visitors to the Museum, 1019.
2. Ditto to Gardens, 1572.
3. Plants sent from Gardens.
4. Ditto received at ditto.
5. Time of leafing, flowering, and fruiting of a few standard plants at Gardens.
6. Books and periodicals received.
7. Presentations to Museum and Library.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for August.
2. Port Arthur, from J. Boyd, Esq., table for August.
3. Swansea, from Dr. Story, table for June and July.
4. Westbury, from F. Belstead, Esq., table for August.
5. Brisbane, Queensland, from E. McDonnell, Esq., table for July, and summary of observations for 1868.
6. Melbourne, from R. J. Ellery, Esq., table for July.
7. Perth, Western Australia, from W. H. Knight, Esq., do do.

The presentations were as follows:—

1. From Mr. Oscar Hedberg, a collection of shells from the East Coast of Tasmania. [In calling attention to this presentation, Mr. Allport remarked that many of the specimens were very excellent of their kind, and although not new to the Museum, were valuable for the purpose of exchange.]
2. From Mr. Chaplin, a mineralogical specimen from Black Brush.
3. From Mr. H. McRa, specimens of Lava and calcareous Tufa, also a Spirifer, from Abyssinia, near Bothwell. A stone implement of the Aborigines.
4. From Mr. A. H. Swift, Little Taylor's Bay, two specimens of Iron Ore *(Hematite)* from Point Ventinat.
5. From G. Dinham, two fossil Shark's Teeth from the Lias, near Bath, England.
6. From Mr. C. A. Glover, 15 mineralogical specimens from West Coast of Tasmania. Also specimens of a fibrous plant, supposed by the donor to be a new species, from the same locality.
7. From Mr. G. P. Clifford, Dunedin, two Boulders *(Septaria)* from Moeraki Beach, New Zealand. [These boulders are found in large numbers on the beach referred to, and not elsewhere in New Zealand. They vary in size from that of a cricket ball up to seven or eight feet in diameter, are of calcareous composition, and are remarkable for the regularity of their form, which is almost pertectly spherical. When burned they make an excellent cement.*]

* One of them has since been divided, and found to be hollow in the centre, the cavity being lined with crystals of Carbonate of Lime.

8. From H. Gichard, H.I.M. ship La Somme One bronze Coin, value 5 cents, one silver ditto, 50 cents.
9. From C. Heron of the same ship. Two copper Coins, Colony of Cayenne, Louis 16th, 1789, and Republic of Berne, 1796.
10. From Mr. J. Walch. A Shilling of Queen Elizabeth; a Farthing of George 2nd, 1741; a copper Coin of French Republic (L'An 5); ditto of one of the Roman Emperors, &c.
11. From Mr. F. E. Bomford. Specimens of Fluke *(Distoma sp.)* from liver of a Shark.
12. From Mr. S. H. Wintle. A Pamphlet on the Progress of Botanical Discovery in Australia. By W. Woolls, F.L.S.
13. From Mr. Kelly. A Brass Basin, probably of Indian manufacture.
14. From Mr. A. McLaren. Specimens of Barnacles from piles of Wharf.
15. From the Secretary of War, United States. Report for 1866; and Report on Epidemic Cholera, 1867. Catalogue of Surgical Section. U.S. Army, Medical Museum, 1866.
16. From the Smithsonian Institution, Washington. Report for 1865.
17. From the Boston Society of Natural History. Proceedings, volume 7, 10, and Nos. 1 to 6 of volume 11. Memoirs of ditto, volume 1, parts 1 and 2.
18. From Essex Institute, Salem, Massachusetts. Proceedings, volume 4, parts 1 and 2 of volume 5, and Naturalists' Directory, No. 1.
19. From American Philosophical Society, Philadelphia. Proceedings volume 10, No. 76.
20. From the American Academy of Arts and Sciences. Proceedings, volume 6.

The special attention of the meeting was called to the very liberal donation of books, some of them of a very expensive character, lately received from the Government and various scientific institutions of the United States. The books had been sent in return for publications of the Society forwarded to the donors, a system of exchange having been initiated some time since through the Smithsonian Institution at Washington.

Mr. M. Allport read a paper on "Net Fishing in the River Derwent," in reference to which several of the Fellows present fully bore out that gentleman's statements as to the permanent damage entailed on the fisheries by the use of the small meshed seine nets.

Special votes of thanks were accorded to the American Government, the Smithsonian, and other institutions, for the donations of books. Also to Mr. Allport for his very able paper. The proceedings closed with the ordinary vote of thanks to the donors of presentations.

OCTOBER, 1869.

The monthly evening meeting of the Fellows was held on Tuesday, the 12th October, C. Gould, Esq., F.G.S., in the chair.

The hon. Secretary, Dr. Agnew, submitted the usual returns for the past month, viz. :—

1. Visitors to the Museum, 880.
2. Ditto to Gardens, 2,355.
3. Plants and seeds sent from, and received at Gardens.
4. Times of leafing, flowering and fruiting of a few standard plants in Botanic Gardens.
5. Books and periodicals received.
6. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for September.
2. Swansea, from Dr. Story, table for August.
3. Westbury, from F. Belstead, Esq., ditto for September.
4. Port Arthur, from J. Boyd, Esq., ditto, ditto.
5. Sydney, from G. R. Smalley, Esq., Government Astronomer, table for June.
6. Melbourne, from R. J. Ellery, Esq., table, &c., for August.
7. Perth, Western Australia, from W. H. Knight, Esq., table for August.

The following presentations to the Museum were brought under the notice of the meeting :—

1. From Captain Roberts, a Snake and three Centipedes.
2. From F. B. Wilkinson, Esq., a Mountain Duck *(Casarca tadornoides)*.
3. From Mr. W. Exton, Oatlands, a Chestnut-faced Owl *(Strix castanops)*.
4. From Mr. R. Propsting, a Harrier (*Circus assimilis*). [This bird is known as the "Swamp Hawk" of the colony.]
5. From A. H. Maning, Esq., a Sun Dial, made and used by Spanish shepherds.
6. From Mr. H. Turner, an Irish Penny, and a Sydney Token.
7. From Miss Castray, Leaves of Silver Leaf Tree from Table Mountain, Cape of Good Hope; a Damara Lady's Necklace, from South Africa.
8. From Mrs. J. R. Buckland,—A Bullet from a double-barrelled gun, found loaded, on the 30th May, 1859, by the side of two skeletons belonging to the retreating party of Sir John Franklin's expedition, in a boat on the west coast of King William's Island, lat. 69deg. 8min., N., long. 99deg. 24min., W. [Vide "Fate of Franklin and His Discoveries," by Captain McClintock, page 294.] A portion of a Boat's Ensign, belonging to the same expedition, left at the Northern Cairn, Cape Felix, May, 1847, and discovered May, 1859, by Lieut. Hobson, of Lady Franklin's screw yacht Fox. A portion of the Riband of the Order of the Redeemer, of Greece, worn by the late Sir John Franklin. An Almond from the Convent Garden on Mount Sinai.
9. From Mr. W. Knight, jun.,—A collection of Geological Specimens brought by Mr. Glover from the western coast of the Island.

The Secretary brought under notice a model of a Reel invented by Sergeant Eccleston, R.A., Instructor of Artillery, to be used for the purpose of winding up the line in deep sea fishing. A letter descriptive of the manner of using it, and setting forth its advantages, was read.

Mr. Stephens read some "Notes on the occurrence of gold at Port Cygnet."

Mr. Gould was much interested in the information contained in Mr. Stephens' paper, as he had not had an opportunity of minutely examining the country about Port Cygnet. The discovery of fossils in the quarry alluded to, would be of the greatest importance, and he hoped, if any were discovered, they would be preserved for scientific examination. As to the specimens on the table, said to have been obtained from the vicinity of Port Davey, although he had visited that part of the country, several of them were new to him. He would instance more particularly the serpentine, which was much more like that on the North of the Island than any he had seen to the westward. Further information, however, was much required, as the specimens lost a great deal of their interest by not having labels affixed; and geological specimens generally were of very little value if not accompanied by a notice, defining exactly the localities in which they were found.

Mr. J. W. Graves mentioned that gold in small quantities was discovered at Port Cygnet in 1852.

Mr. Stephens was anxious to induce Fellows to send specimens of natural history to the Museum, which, in many respects, was still very deficient. He would refer to one subject alone, that of our land shells. Of these, we had no proper collection, and if any information in reference to them was required, it would have to be sought for in the private museum of a naturalist (Dr. Cox), in Sydney—a circumstance which was scarcely creditable to us.

Mr. Justin Browne observed that at a former meeting he had suggested that lists of such objects as we wanted might be exhibited at all the Post Offices in the interior, and he thought that if our wants were thus made generally known, many people in the country would send contributions.

The Secretary informed the meeting that lists of desiderata for the Museum had been printed and forwarded to all the Fellows, and to many others. Scarce any response was, however, made to the appeal, except by Mr. W. Gellibrand, and also by Mrs. C. Meredith, who had contributed many valuable preparations of our sea-weeds and other objects.

Mr. Graves mentioned he had lately received from Mr. Groombridge, of North West Bay, a black Wallaby. He had frequently seen the Albino variety, but had never seen or heard of a black one. He was inclined to believe it might be found to be a new species. It was now alive at his house for inspection.

Mr. Castray (A. C. G.), in referring to presentation No. 7, observed if it was thought advisable by the Society to make exchanges of plants and seeds with the Cape, Mauritius, or Madagascar, that he would be happy to be the means of effecting such exchange, as he had correspondents in those places. Mr. Castray's offer was at once accepted.

Mr. Graves enquired if there were any berry-bearing wild plants at any of the places named, as such, if suitable to this climate, would be of great value both for our indigenous and acclimatised animals?

Mr. Castray thought there were some at the Cape which might be introduced with advantage.

A vote of thanks having been accorded to Mr. Stephens for his paper, and to the donors of presentations, the meeting terminated.

NOVEMBER, 1869.

The monthly evening meeting of the Fellows, the last of the session, was held on Wednesday, the 16th November, J. Barnard, Esq., in the chair.

The Secretary, Dr. Agnew, laid on the table the following returns for the past month:—

1. Visitors to Museum, 3204.
2. Ditto to Gardens, 2624.
3. Times of leafing, &c., of a few standard plants in gardens.
4. Books and periodicals received.
5. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for October.
2. Port Arthur, from J. Boyd, Esq., table for ditto.
3. Swansea, from Dr. Story, table for September.
4. Sydney, from G. R. Smalley, Esq., tables for July (printed).
5. Melbourne, from R. L. J. Ellery, Esq., table and notes for September.
6. New Zealand, from Dr. Hector, tables for June and July.
7. Westbury, from F. Belstead, Esq., table for October.

The presentations to the Museum were as follows:—

1. From Captain Garth, an albatross *(Diomedia exulans)*, caught on the East Coast of the colony.
2. From Miss Peck, an English barn owl *(Strix flammea)*, prepared and mounted.
3. From Salmon Commissioners, a Salmon Smolt, caught in the Derwent.
4. From Mr. M. Allport, two fish from Wedge Bay.
5. From the Hon. J. Maclanachan, Esq., a Pheasant, a cross between the English and Chinese varieties.
6. From Mr. J. C. Edgar, Sorell, 7 specimens of Land Shells.
7. From Mr. W. Legrand, 2 specimens of Land Shells. *(Bulimus Tasmanicus.)*
8. From Mr. E. D. Swan, polished specimen of Fluor Spar, from Derbyshire, England.
9. From Mrs. New, Bagdad, for Mr. J. Davies, a brown Trout *(Salmo fario)* caught in the Bagdad creek.
10. From G. Luttrell, shell impressions from Port Cygnet.
11. From Captain Williams, two samples of water from a mineral spring at Spring Bay. Also the tail of a large Tunny, which was driven on shore by a porpoise at Spring Bay. The fish weighed over 400 lbs.

Mr. J. Davies presented for examination a sample of gold, weighing about 1¼ oz., which he could state from excellent authority was obtained by two men, in two days' work by digging at the Black Boy Reef at Mangana.

Mr. Davies also submitted a sample of so-called jewel-sand for the purpose of obtaining the opinion of the Society as to the fact of its containing precious stones. (This sand has been examined under the microscope, but no valuable stones were found to be present; it contained, however, a considerable proportion of fine gold.)

Mr. M. Allport called attention to the presentation of a smolt by the Salmon Commissioners as placing upon record the first incontestable proof of the success of the grand experiment in which the Royal Society of Tasmania had from the first taken so deep an interest. The last of the smolts hatched from English eggs left for sea in October, 1868, and, if not destroyed, those fish must either be grilse or approaching grilse-hood; that is

to say fish of from two pounds to eight pounds in weight, whereas the largest of the fish now caught weighs under half a pound, and carries with it a proof of its having but just left fresh water, as the silvery scales came off at the slightest touch, leaving the colour and markings of the parr distinctly visible beneath. It is therefore certain that these smolts are the produce of the Colony, as the parent fish must have returned from sea to deposit the ova from which such smolts were hatched. Doubts have been expressed by many colonists as to the nature of the fish, one specimen of which has been just presented to the Museum, and a slight reference to the subject is therefore necessary. In the first shipment—which arrived in 1864—the only migratory species introduced was the salmon *(Salmo salar)*, while the second shipment—which arrived in 1866—contained two—the salmon and the salmon trout *(Salmo trutta)*,—and it follows that these smolts, caught in salt water, must belong to one of these two species, though one learned gentleman has expressed his opinion that they are river trout *(Salmo fario)*, in happy ignorance that the latter species cannot live in salt water. The second shipment arrived here early in the year 1866. In October, 1867, a portion of the smolts of that shipment left for sea. In October, 1868, the remaining smolts all left except a few salmon trout *(Salmo trutta)*, retained in a pond for breeding purposes. The salmon trout so retained, although well-grown, healthy fish, showed no signs of spawning till the winter just past, and their progeny are now about an inch and a half long. It is, therefore, probable that the fish which went to sea in October, 1867, did not return as spawners till the winter of 1869, in which case the smolt now exhibited can only be the young of the salmon *(Salmo salar)*. Again of the salmon *(Salmo salar)*, about 8000 are known to have left the ponds, and it is probable that about 2000 more ought to be added to that number, while of salmon trout *(Salmo trutta)* not more than 300 fish can have gone—in addition to which it must be remembered that the salmon have been two years longer in the river. In answer to those who unhesitatingly assert that these smolts are salmon trout, it may be mentioned that the first authorities in the world on the Salmonidæ expressly point out that the various species of the genus Salmo in their immature stages closely resemble one another, and that a very slight variation from the normal type, which variation is by no means uncommon, may make it most difficult to determine the species of any single specimen, and we should therefore receive the decisive opinions of gentlemen who have no specimens to refer to with some degree of caution, especially when those opinions are strongly opposed to the probabilities. One specimen has been sent to Dr. Günther (a leading authority on the subject) by the Salmon Commissioners with a view to obtaining his opinion as to its species before handing it to Mr. James A. Youl, to whom it is to be ultimately presented. After all if, with the chances so much against it, these should be salmon trout instead of salmon, the success of the experiment is none the less proved, as if one migratory species can succeed with a few hundreds turned out, how much more likely is the other to succeed when several thousands were liberated.

The Hon. Secretary read a paper by E. D. Harrop, Esq., F.R.M.S., of Launceston on the *Phyllactidium pulchellum*, one of the Confervoid Algæ. Specimens of this, and of several others of the same group, beautifully mounted by Mr. Harrop, were presented by him to the Museum.

The usual vote of thanks (proposed by Mr. Bilton) to the donors of presentations, and the author of the paper, being passed, the meeting broke up, and the fellows adjourned to the large room in which the Society's annual Microscopical Exhibition was being held.

Here twelve instruments were at work with objects in great variety, and, as Fellows have the privilege of introducing ladies to this meeting, the room was filled with pleased and interested visitors. The exhibitors

were Messrs. F. Abbott, F. Abbott, jun., Agnew, M. Allport, E. Giblin, W. Johnston, Legrand, Napier, W. Stone, and Roblin.

Mr. Abbott exhibited a great variety of instruments and objects of scientific interest, including groups of Diatoms, test lines after Nobert, specimens of diamond engraving, &c.

Mr. F. Abbott, jun., by means of a binocular instrument, showed a series of metallic substances, embracing Gold, Copper, Iron Pyrites, &c.

Dr. Agnew exhibited specimens of Confervoid Algæ, received from and mounted by Mr. E. D. Harrop, of Launceston.

The circulation in the Tadpole was well displayed by Mr. M. Allport, and by Mr. E. Giblin, who also showed a micrometer, together with various crystals by polarized light, insects, &c., &c.

Mr. Legrand had a series of twelve varieties of Tasmanian Polyzoa.

Mr. Napier displayed some exquisite crystals under polarized light, and also specimens of English Polyzoa.

Sections of Colonial Woods, and other objects, were shown by Mr. W. Johnston, Trinity Hill.

Mr. Stone and Mr. Roblin exhibited the circulation of the sap in the *Nitella flexilis*, and the latter also showed the cup-like covering of the larva of a manna-making insect *(Psylla sp ?)* from leaves of the Eucalyptus, presented by Mr. S. H. Wintle.

The various objects under view were carefully examined by the numerous visitors, many of whom before leaving expressed their sense of the gratification and pleasure which had been afforded to them by the exhibition.

NET-FISHING IN THE DERWENT.

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

During the months of November, December, and January, when the freshets caused by the winter's rains having subsided, and the tidal waters get low and brackish, shoals of fish commence running up from Storm Bay and the open coast into the estuary of the River Derwent, for the purpose of depositing spawn in the shallow landlocked bays, which abound from Rosny and Macquarie Point upwards.

Of such fish, the most valuable are Flounders and Soles; the other being Bream, Mullet, Mackerel, Native Salmon, Kingfish, and a few species of comparatively minor importance.

No exact season can be fixed for the spawning of any of these fish, the time of the deposition of the ova varying in different years from causes of which naturalists are at present ignorant; and even in the same summer, many weeks often elapse between the deposition of the first and last spawn of each particular species. The parent fish having deposited the spawn, remain in the river, safe from the attack of their more formidable marine enemies, till their strength is recruited, and return to the sea with the first floods of winter.

The development of the spawn and subsequent progress of the fry are not so well ascertained as the habits of the parent fish; but the probability is, that the fry—like those of most summer spawning fish—are very rapidly hatched, and increase their weight quickly at first, as otherwise they could never hold their own against the attacks of the innumerable enemies to which they are subjected in their early helpless stages. The fry of several species remain through the winter in the comparative security afforded by the sheltered waters of the river, leaving for sea at the end of the following autumn, and becoming marketable in the ensuing spring—two years after they are hatched.

Forty years ago, the bays near Hobart Town swarmed with fish during the summer months, and flounders and soles could be caught in any quantity on all the beaches at Sandy Bay. Vast shoals of Bream, Mullet, and Native Salmon, made their way up to the junction of the fresh and salt water at Herdsman's Cove, in the Jordan, and above New Norfolk in the Derwent, at both which places angling was for several years afterwards successfully carried on.

In the summer months, between the years 1840 and 1850,

anyone standing on the rocks near Green Point might have seen myriads of large fish passing and repassing with each tide, in and out of the estuary of the Jordan, and Bream of two or three pounds each played in thousands about the shallows above Bridgewater, and at New Norfolk.

In those early days and for many years afterwards, all the fish required for the Hobart Town market were easily obtained in the neighbourhood, and comparatively few nets were worked, but as the town grew the demand became larger; the number of nets increased, they were worked night after night without any reference to season, or restrictions as to the sale—everything with fins was swept up, and the nearest bays denuded of their fish.

The nets used were seines of great length, with meshes generally less than an inch square; they were paid out from the stern of a boat in a large semicircle, and then hauled from both ends on to the shore. The fishing was carried on at night, when the bulk of the fish referred to were feeding in the shoal water, or depositing their spawn—in the latter case much of the spawn must have been totally destroyed, because the weeds upon which it was hung would choke the lower portion of the net, and weeds, spawn, and minute fry would alike be drawn on shore and left to perish.

As the bays which were fished near town became exhausted, the men began to follow the unfortunate spawning fish further and further up the river. Unprotected by any law, that which ought to have been regarded as a nursery, from which to supply the lower waters periodically with marketable fish, was more and more encroached upon, and as might have been expected, the fish grew scarcer and scarcer and smaller and smaller, till flounders two inches across, and mullet three inches long were to our national disgrace hawked about the streets. Line fishing above the town became a mockery, and those who remember the sport of other days gave it up in utter disgust.

Angling in the upper waters fared no better, and was partially abandoned, while half a dozen net fishermen continued doing their utmost to kill the goose, which, with proper care, ought to have provided them and their descendants with golden eggs for all time.

In the year 1864, it became necessary, in order to ensure the safety of the few dozen of salmon smolts then descending the Derwent, to put some restraint upon the excessive netting in the river, and the Salmon Commissioners availed themselves of the power given them under the Salmon Act, and recommended the suppression of all netting above the town. At the time, one or two men made a faint show of resistance to

this measure, but did not press the subject probably because, having so far stripped the river, there was not much lost by the restriction.

The improvement consequent upon stopping the netting soon became apparent. Towards the end of the second season the hand-line fishing from boats near town improved considerably, and the fish have since steadily increased both in quantity and size. Angling has been resumed with great success in the lower waters, and is gaining in favor as a healthy and profitable recreation each year. Near the mouth of the Sorell Rivulet shoals of large bream have been constantly seen, where, a short time ago but few, and in some seasons, none showed themselves, One man who has fished the river for more than 30 years, and on whose veracity I can rely, assures me that he has seen a shoal of these fish covering half an acre, and that he believes the river will soon be what it was in its best days.

The bays about New Town and Risdon have been alive with fish during the last season, and anglers in those waters rarely failed to make good baskets.

This abundance of fish in the bays above the town has now excited the cupidity of those few net fishermen who do not consider anything beyond their present gain, and who for the sake of two or three good seasons would not only run the risk of wasting all the money and labour expended, for their own ultimate benefit, in the salmon experiment, but would even wantonly sacrifice the permanent interest of the public, and especially of the angling and line fishing public, by scraping up every spawning fish they can follow to the shallows, and thus undo all the good work which the Salmon Commissioners have done by placing some restriction on the netting.

These fishermen are now urging Parliament to re-open the river, and those who advocate this to do so mainly on two grounds, one the hardship to the fishermen by taking away their means of livelihood, the other the advantage to be gained by catching a veritable salmon, and proving beyond doubt the success of the experiment.

As to the first ground, it is difficult to understand why the presence of a larger number of fish in the upper waters makes the hardship any greater now than it was in 1864. On the contrary; the closing the river has each year tended to make the fishing in the lower waters better at those seasons in which the fish ought to be caught.

Had the net fishermen been allowed to go on as they had commenced, the river would soon have yielded them no profit at all, either in the upper or lower waters, a hardship much more serious than any they can now be subjected to by keeping

the upper waters closed, as each winter will bring a fresh supply of marketable fish within reach of their nets.

It is also stated that in severe southerly weather the men must either go up the river or lie idle at great loss, but the upper waters are only worth netting in summer and autumn, when southerly gales are rare. The men who are really the sufferers by heavy southerly weather, are not the seine net men, but the deep-sea fishermen, who have to get from 20 to 60 miles out on to the exposed coast.

It is a rather significant fact that since the closing of the river, deep-sea well-boats of superior build have increased in number, and, with the single exception of flounders, the better fish have been brought to market in such numbers that real trumpeter are now cheaper than when the river was open, although quantities are occasionally sent to Melbourne.

It is quite probable that if the upper waters were thrown open during the next two seasons, there would be for a time such a supply that the market of the deep-sea fish might be materially affected, and some of the boats withdrawn from an industry which deserves every encouragement—in other words, we should sacrifice a legitimate trade for that which ought to be considered illegitimate.

Even if some hardships could be shown to exist, surely the future interests of the whole public are not to be sacrificed for the immediate and short lived benefit of some two dozen men, for it must be remembered that in the port of Hobart Town, the whole of the boats and gear fitted for this destructive fishing, are the property of two individuals, and that the hands employed in it rarely exceed 20 at any one time. The injury inflicted upon these 20 men and their families, by the closing of the river, can only be estimated at the difference between the wages they used to earn at the fishing in 1864, when it was failing perceptibly, and what they can now earn at any other occupation, and that difference must be trifling.

As to the second ground upon which the opening of the river is advocated, it is by no means certain that allowing the nets to be worked for a few miles up the river would lead to the capture of salmon, for there can at present only be a few mature fish scattered over a wide expanse of water, and no net really adapted for salmon fishing in the wide tidal waters, with a mesh eight inches round when wet, it is to be found in the colony, and if it could be found it would not suit the purpose of those fishermen, who, caring little for the success or failure of the salmon experiment, simply wish to scrape out everything saleable, and would never be satisfied to use a mesh through which a fair sized smolt could pass.

Again, it is quite possible that the space travelled over by

the salmon in their migration seaward may depend much upon their supply of food, and that, while the fish are scarce and their food abundant, they will not travel far from the junction of the fresh and salt water.

Granting that salmon might be caught by opening the river and using proper nets, is it not manifest that the rapid stocking of our rivers would be more seriously retarded by killing half-a-dozen salmon now, when only a few pairs reach the spawning beds, than by killing as many thousands a few years hence, when every gravelly rapid over hundreds of acres will be tenanted by spawning fish?

NOTES ON THE OCCURRENCE OF GOLD AT PORT CYGNET.

By T. Stephens, M.A.

A visit recently paid to Port Cygnet has resulted in a discovery which is not without interest from a scientific point of view, if nothing more. Having had to traverse the Huon district in all directions for several years past, in the discharge of official duties, I had become tolerably familiar with its principal geological features, which present few variations from those that prevail in the neighbourhood of Hobart Town, and the greater part of the Derwent basin. If a line be drawn from the East Coast through Campbell Town to the Great Lake, and thence southwards to Recherche Bay in a direction nearly corresponding with the course of the 147th meridian, the area included between this and the coastline is the only large section of Tasmania in which there is no ground for expecting discoveries of gold or other valuable metals. The sedimentary rocks of the whole of this area may be described in general terms as Upper Palæozoic. They comprise the carboniferous series, and probably pass upwards into the counterparts of rocks now established in Victoria as Mesozoic, and they are here and there overlaid by Tertiary and Post-tertiary deposits. The whole series, to the Tertiary inclusive, has been penetrated and intersected to an extraordinary extent by trappean and basaltic rocks, which frequently hide the sedimentary strata altogether from view over extensive tracts of country.

But none of the older rocks, the recognised source of gold wherever it has been found in paying quantities, have hitherto been known to exist within this area, and as the greater part of it has been pretty well explored by the geologist, it is only in an odd corner, here and there, that their presence comes within the range of possibility. The oft repeated announcement of the discovery of gold in small quantities at Port Cygnet, added to a previous acquaintance with the indications of extensive denudation of the upper Palæozoic sandstones and mudstones in that neighbourhood, suggested to me the idea of paying closer attention to the spots where any of the primary rocks, which by any chance had been elevated above the sea level, might be expected to show themselves. And after a brief examination of the rock exposed in a quarry near the southern extremity of the township, and in a small tributary

of the Agnes Rivulet, I have little hesitation in pronouncing it to be of earlier date than any which has hitherto been recognised in the above-mentioned area. It varies in character from a soft arenaceous clay slate to a hard compact grit, containing in places rolled pebbles and boulders of schistose or metamorphic rocks, with porphyries and granite, and is in all respects analogous to portions of the old conglomerates of the North Coast, which are undoubtedly of Silurian age. It occurs on both sides of the Agnes Rivulet, which seems to occupy a synclinal hollow, and it is evidently unconformable to the Upper Palæozoic mudstones by whose denudation it has been exposed. The ruling angle of dip is about 60°, the strike being nearly north and south. The rock is in places highly impregnated with iron pyrites, and I noticed faint impressions, apparently of organic origin, but too indistinct to be made out on the spot, and the matrix too perishable to allow of its removal for examination. Until some fossils have been discovered and identified, all further speculations as to geological age are quite futile, but the search for them I must leave to those who have plenty of leisure time.

The existence in this neighbourhood of an interesting porphyritic rock, containing large crystals of felspar, has long been known. Though peculiar to the district it is analogous in several respects to many common members of the trappean series, but the entire absence of hornblende, which in them is a distinguishing feature, is noticeable. It is clearly newer than the grit just described, which it intersects in the form of a vast dyke on the western side of the township, another branch showing itself in a quarry near the new slab road; and it seems probable that the quartzose veinstones, which have been quite recently met with, and which appear to traverse the porphyry near some of its points of contact with the older rocks, are the source of the gold which has been sparingly found in the alluvium of adjacent gullies. Whether a careful assay of specimens from these veinstones will result in the establishment of this theory remains yet to be proved. Unfortunately the most interesting part of the quarry last referred to, is now under water, and there is no other spot in the neighbourhood which affords similar facilities for investigating the subject. There are well authenticated instances in Victoria of the occurrence of auriferous veins of similar character in diorites closely allied by their geological relations to the porphyry of Port Cygnet, but I see no grounds at present for advising any large outlay in the search for gold. It is clear that in the shallow alluvium, where it has hitherto been found, there is no prospect of an adequate return for the expenditure of labour and capital, and it is equally clear that

the deep ground, where there is only a remote probability of the existence of an auriferous lead, could not be worked except at very great expense. Again, the quartzose veins of the porphyry have not yet been seen developed in any practicable shape. Attention has however been directed to the subject, and it is by no means improbable that continuations of these veins will some day be traced into the more substantial forms by which, under similar geological conditions, they are elsewhere represented.

THE PHYLLACTIDIUM PULCHELLUM.

By E. D. Harrop, F.R.M.S.

Phyllactidium Pulchellum ... Kutzing. Gray.
Coleochæte Scutata ..... Brébison. Hassall.

It may be well to place on record the fact that this beautiful microscopic plant has been noticed in Tasmania; and as so little is known of it even amongst microscopists, I will, at the same time, with the permission of the Fellows of the Society, describe it, and give a few lines on its history.

The first occasion on which it was observed here was last year by Mr. Sale, of Launceston, by whom it was found adhering to the glass sides of his aquarium, and since then I have discovered it in its natural habitat, namely, the leaves and stems of water plants. I send prepared specimens for examination by the Fellows.

Although this plant was discovered in England in 1844 by Mr. Ralfs, who published a paper describing it in the "Annals of Natural History" in 1845; yet so seldom had it been noticed by Algologists, that Dr. Gray, F.R.S., described it in "Seeman's Journal of Botany," in 1866, as new to Great Britain. Kutzing appears to have been its first discoverer in 1838, when he met with it growing in an aquarium. Brébison also observed it in 1844 at Falaise, growing on the leaves and stems of inundated and in part decomposed water plants, principally on the Sparganium natans and Potamogeton natans. He named it the Coleochæte Scutata, and from the setigerous sheaths, growing sometimes numerously from the upper portion of the cells, considered that it should be placed in the Chætophoroidæ, and near the Bulbochæte. The generic and specific names of Phyllactidium pulchellum first given it by Kutzing, and confirmed by Gray, are those by which it is now known.

From the fact that this plant has generally been found associated with, or rather in water in which the Volvox Globator has been abundant, it was presumed by some observers that there was some connection between the plants; but its affinities are with quite another family of the Confervoideæ, namely, the Chætophoraceæ.

From most, if not all, of these plants there grows on the back of some of the cells a sheath having a bulbous base, and

from out of which apparently issues a delicate setaceous filament of considerable length. These setæ are not always met with, and I should say are rarely seen in mounted specimens, as they are extremely caducous. It is these setaceous filaments which place this remarkable plant in the family Chætophoraceæ of the Confervoid Algæ, and at the same time would appear to ally it to the Bulbochæte, with which genus Hassall considers it has close affinities.

On the specimens on Slide No. 2, which were taken from the stem of a water plant, there will be noticed on the back of the cells nearer the margin than the centre, several masses of Eudochrome. These are the Sporangia. The reproduction of the plant is said to be effected by zoospores as well as spores, the zoospores being produced singly from the cell contents and bearing two cilia. With plants so minute, observation in respect of the reproduction by zoospores is extremely difficult, and it is but rarely, indeed, that such points can be noted,and only when one is so fortunate as to have a specimen under examination in which the zoospores are on the point of escaping from the cells. This is quite possible when the plant grows in an aquarium, through the sides of which it may be observed with a glass from day to day.

Dr. Gray describes the organism as follows :—" The form is discoidal, circular, slightly concave on one side, formed of very minute, nearly equal sized square cells, placed on forked lines regularly spreading from a central cell to the circumference ; the frond is thin, membranaceous, and the upper and under surfaces are similar. The fructification consists of from twelve to sixteen square thickened patches, forming a circle (sometimes two) rather nearer the margin than the centre of the disc, the square patches being often placed in pairs. The fructification was first observed by Suringar in his thesis entitled " Observationes Physiologicæ," delivered in Leyden, 3rd March, 1857."

This description fails to include the setigerous sheaths, which is an important omission, being that part of its organisation above others which has enabled botanists to give the genus its natural position.

The sheath and filament are well shown on a specimen in preparation No. 2, where the delicate filament will be seen to issue from the setigerous sheath for a length almost equal to the diameter of the frond ; and in both of the preparations (Nos. 2 and 3) of the plant taken from the natural habitat there can be seen, with a little management of the light, numerous sheaths. Specimen No. 1 grew on the glass side of an aquarium, and it will be noticed how much finer the frond is than in those taken from the stems of water plants, so much

so that one might be led to consider it a variety. I think it is a perfectly mature frond as regards size, as the plants disappeared from the aquarium shortly after it was collected. The plant may, moreover, develope better on the smooth glass than on the rougher stems of water plants; in fact, it is just one of those conditions that might fairly be supposed to give rise to a variety.

METEOROLOGICAL AND BOTANICAL ABSTRACT, FOR THE SPRING QUARTER, 1869.

Months.	Mean in Shade.				Solar Intensity Black Bulb Insulated.	Terrestrial Radiation on Grass.	Wind.		Rain.		Evaporation exposed to open Sky.
	Pressure. — Barometer corrected to 32°.	Temperature of Air.	Maximum of Air.	Minimum of Air.			Prevailing Currents.	Force.	No. of Days.	Amount collected.	
	Inches.	°	°	°	°	°		lbs.		In.	In.
Sept. ..	29·947	52·81	75	31	93·77	39·75	N.W., S.E.	62·71	9	0·98	3·52
Oct. ..	29·766	57·58	73	40	102·47	45·13	N.W., S.E.	46·29	15	3·32	2.82
Nov. ..	29·706	59·51	78	40	102·13	45·63	N.W., S.E.	52·01	14	1·87	4·22
Mean..	29·815	56·63	75·3	37·0	99·45	43·50	N.W., S.E.	53·67	38	6·17	10·56

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 twenty-five 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, for the Spring Quarter, 1869.

September 8th.—Common Ash commencing to break into leaf.
,, 12th.—Grape Vines commencing to start.
,, 15th.—Common Oak commencing to break into leaf.
,, 16th.—Moutan Peony commencing to flower.
,, 22nd.—Horse Chestnut ditto ditto.
,, 25th.—Robinia Pseudo-acacia commencing to break into leaf.
October 5th.—Carpinus Betulus commencing to break into leaf.
,, 12th.—Ailanthus Glandulosus ditto ditto.
,, 16th.—Common Lime ditto ditto.
,, 17th.—Black Mulberry ditto ditto.
,, 20th.—Elm Seeds commencing to fall.
,, 26th.—Melia Azederach commencing to break.
November 5th.—First Strawberry (Marguerite) gathered.
,, 10th.—First Cherry (May Duke) gathered.
,, 14th.—Black Mulberry in full flower.
,, 20th.—Pomegranate in flower.
,, 21st.—First Raspberry gathered.
,, 28th.—Bougainvillea Spectabilis in full flower.

NOTE.—Strawberries were four, Cherries six, Black Mulberry seven, and Pomegranate six days later this year than last; the time of the remainder of the above plants being about the same as last year.

METEOROLOGICAL AND BOTANICAL ABSTRACT, FOR THE SUMMER QUARTER, 1869-70.

Months.	Mean in Shade.				Solar Intensity Black Bulb Insulated.	Terrestrial Radiation on Grass.	Wind.		Rain.		Evaporation exposed to open Sky.
	Pressure. — Barometer corrected to 32°.	Temperature of Air.	Maximum of Air.	Minimum of Air.			Prevailing Currents.	Force.	No. of Days.	Amount collected.	
	Inches.	°	°	°	°	°		lbs.		In.	In.
Dec. ..	29·739	61·55	84	40	107·23	38·0	N.W., S.E.	78·83	15	1·47	5·80
Jan. ..	29·758	66·62	99	45	107·60	42·5	N.W., S.E.	92·63	9	4·57	5.00
Feb. ..	29·928	63·45	92	42	107·36	39·0	N.W., S.E.	60·88	5	0·35	5·32
Mean..	29·805	63·87	91·6	42·3	107·39	39·83	NW., SE.	77·44	26	6·39	16·12

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 twenty-five years' standard tables are used for obtaining the difference from the average.

FRANCIS ABBOTT, Private Observatory.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, for the Summer Quarter, 1869.

December 10th.—First Red Currant ripe.
,, 11th.—Common Privet commencing to flower.
,, 14th.—Black Currants commencing to ripen.
,, 15th.—Melia azederach commencing to flower.
,, 16th.—Doyenne d'Ete Pear commencing to ripen.
,, 20th.—Juneating Apple ditto ditto.
January 1st.—First Apricot (Royal) gathered.
,, 8th.—Grevillea robusta in full flower.
,, 9th.—Jargonelle Pear ripe.
,, 12th.—Mulberries commencing to ripen.
,, 14th.—Veronica angustifolia in full flower.
February 1st.—Kerry Pippin Apple commencing to ripen.
,, 2nd.—Windsor Pear ditto ditto.
,, 6th.—Greengage Plum ditto ditto.
,, 15th.—Common Ash commencing to shed seed.
,, 18th—Sycamore ditto ditto

NOTE.—Red Currants were six days, Privet six days, Black Currants six days, Melia azederach three days, Doyenne d'Ete Pear two days, Juneating Apple five days, Apricot nine days, and Grevillea two days *later* than last season; and Kerry Pippin Apple was three days, Windsor Pear four days, Ash three days, and Sycamore four days *earlier*. The remainder were about the same time as last year.

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA

FOR THE YEAR

1869.

A
TASMANIA:
PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.
1870.

PATRON:

Her Majesty

The Queen.

Royal Society of Tasmania.

Patron:

HER MAJESTY THE QUEEN.

President:

HIS EXCELLENCY CHARLES DUCANE, ESQ.

Vice-Presidents:

HON. T. D. CHAPMAN, ESQ., M.H.A.
VEN ARCHDEACON DAVIES
HON. SIR R. OFFICER, M.H.A.
J. W. AGNEW, ESQ., M.D.

Members of Council:

*F. ABBOTT, ESQ., F.R.A.S.
*HON. T. D. CHAPMAN, ESQ., M.H.A.
*T. GIBLIN, ESQ.
*JUSTIN McC. BROWNE, ESQ.
SIR R. OFFICER, KNT., M.H.A
T STEPHENS, ESQ., M.A.
H. J. BUCKLAND, ESQ.
J. BARNARD, ESQ.
VEN. ARCHDEACON DAVIES
HON. A. KENNERLEY, ESQ., M.L.C.
M. ALLPORT, ESQ., F.L.S., F.Z.S.
J. W. AGNEW, ESQ., M.D.

Treasurer:

J. DUNN, ESQ.

Hon. Secretary:

J. W. AGNEW, ESQ., M.D.

Auditors of Annual Accounts:

F. BUTLER, ESQ.
H. COOK, ESQ.

Auditors of Monthly Accounts:

M. ALLPORT, ESQ.
F. ABBOTT, ESQ.

Curator of Museum:

MR. T. ROBLIN.

* Members who retire next in rotation.

Honorary Members.

HIS EXCELLENCY SIR WM. T. DENISON, K.C.B., F.R.S., &c., England.

HIS EXCELLENCY SIR GEORGE GREY, K.C.B., &c., Governor ———.

CHARLES JOSEPH LATROBE, Esq., England.

SIR HENRY EDWARD FOX YOUNG, K.C.B., England.

Corresponding Members.

W. H. ARCHER, Esq., Registrar-General, Melbourne, Victoria.

JOHN JOSEPH BENNETT, Esq., F.R.S., British Museum, London.

REV. W. B. CLARKE, M.A., F.G.S., &c., Sydney.

JOHN GOULD, Esq., F.R.S., London.

JOSEPH DALTON HOOKER, Esq., M.D., R.N., F.R.S., &c., London.

JOSEPH H. KAY, Captain R.N., F.R.S., Melbourne, Victoria.

REV. R. L. KING, B.A., Sydney.

J. MITCHELL, Esq., Sydney.

BARON F. VON MUELLER, C.M.G., M.D., F.R.S., F.L.S., &c., &c., Government Botanist, Melbourne, Victoria.

JOHN PEET, Esq., Professor, Grant's College, Bombay.

FREDERICK PENNY, Esq., F.R.S., Professor of Chemistry in the Andersonian University, Glasgow.

W. J. MACQUORN RANKIN, Esq., C.E., F.R.S.L., and E., &c.

W. A. SANDFORD, Esq., Colonial Secretary, Western Australia.

W. WILSON SAUNDERS, Esq., F.R.S., &c., London.

ALFRED R. C. SELWYN, Esq., F.G.S., Government Geologist, Victoria.

REV. CHARLES PLEYDELL N. WILTON, M.A., Newcastle, New South Wales.

ADAM WHITE, Esq., F.L.S., &c., British Museum, London.

E. S. P. BEDFORD, Esq., F.R.C.S.L., Sydney, New South Wales.

C. TOMLINSON, Esq., Lecturer on Physical Science, King's College School, London.

G. BENNETT, Esq., M.D., F.Z.S., Sydney, New South Wales.

G. KREFFT, Esq., Curator of Museum, Sydney, New South Wales.

PROFESSOR G. NEUMAYER, Munich.

REV. JULIAN E. T. WOODS, F.L.S., F.G.S., F.R.G.S., &c., Penola, South Australia.

DR. W. O. SONDER, Foreign Hon. Sec. Society of Naturalists, Hamburg.

List of Fellows.

† *Denotes Life Membership.*

Abbott, Francis, F.R.A.S., F.R.M.S.	Hobart Town
Abbott, F.. jun....	,,
Adams, G. P.	,,
Agnew, J. W., M.D.	,,
Allport, Joseph	,,
Allport, Morton, F.L.S., F.Z.S.	,,
Archer, William, F.L.S.	Cheshunt
Atherton, E.	Hobart Town
Atkinson, Rev., H. D....	Oyster Cove
Bilton, H.	Glenorchy
Barnard, James...	Hobart Town
†Barry, Sir R., Puisne Judge...	Melbourne
Boyd, James, Civil Commandant	Port Arthur
Brent, John	Hobart Town
Butler, Francis	Hobart Towu
Butler, J.	Badgad
Bromby, Right Rev. C.H., Lord Bishop of Tasmania	Hobart Town
Bright, R. S., M.R.C.S.L	,,
Butler, Henry	,,
Buckland, H. J.	,,
Browne, Justin McC	,,
Chapman, Hon. T.D., M.H.A.	New Town
Cook Henry, M.H.A....	Hobart Town
Clarke, J. M.	,,
Creswell, C. F.	,,
Cotton, Francis...	Swanport
Crawford, Lieut.-Colonel	New Town
Cruttenden, Thomas	Woodsden
Davies, Ven. Archdeacon	Hobart Town
Davies, John, M.H.A.	,,
Dear, R. E.	,,

Dobson, Hon. W. L., M.H.A.	Hobart Town
Dobson, H.	,,
Dunn, J. A.	,,
D'Emden, H. J.	,,
Du Cane, His Excellency C....	Government House
Fenton, Michael	Fenton Forest
Fitzgerald, Robert	Hobart Town
Foster, Hon. John, M.L.C.	,,
Giblin Thomas...	,,
Gould, C., F.G.S., Government Geologist... ...	,,
Gorringe, Thomas	Green Ponds
Grant, James	Tullochgorum
Greig, C. G.	Hobart Town
†Gunn, R. C., F.R.S., F.L.S.	Launceston
Graves, J. W....	Hobart Town
†Gellibrand, W. A. B.	River Ouse
Guesdon, W. A., jun.	Hobart Town
Hall, Dr. E. Swarbreck	Hobart Town
Harris, Rev. R. D., M.A	,,
Hinsby, Henry	,,
Hopkins, Henry	,,
Hunter, Henry	,,
Huston, G. F.	New Norfolk
Huybers, A.	Hobart Town
Hopkins, H., jun.	,,
Irving, Professor	Melbourne University
Ingle, J.	England
Jackson, Adam	Ross
Johnston, William	Hobart Town
Kennerley, Hon. Alfred, M.L.C.	Hobart Town
Kermode, Hon. R. Q.	Mona Vale
Knight, W., jun.	Sandy Bay
Langdon, Captain the Hon. W., R.N., M.L.C. ...	Montacute
Lewis, David, M.H.A.	Hobart Town
Lowes, Hon. T. Y., M.L.C.	Glenorchy

Maclanachan, James	Ballochmyle
MacNaughtan, Alexander	Hobart Town
Mather, J. B.	,,
Maxwell, C. M	,,
†Milligan, Joseph, F.L.S.	England
Moore, J. A.	New Norfolk
Meredith, Hon. C., M.H.A....	Hobart Town
Morrison, Askin	,,
Marsh, H. J....	,,
Mace, J. C.	Clarence Plains
Mace, G.	Spring Bay
Napier, G. R.	Hobart Town
Nelson, H.	,,
Officer, Hon. Sir Robert, M.H.A., Speaker ...	New Norfolk
Pillinger, J.	Antill Ponds
Roberts, H. L....	Hobart Town
Salier, G., M.H.A.	,,
Sharland, W. S., M.H.A.	New Norfolk
Solomon, Joseph	Hobart Town
Stephens, T., M.A., Inspector of Schools... ...	,,
Story, J. F.	Swanport
Storie, Rev. J....	Hobart Town
Susman, L.	,,
Stone, W.	,,
Swan, E. D.	,,
Scott, J., M.H.A.	Launceston
Scott, J. R., M.H.A....	New Town
Tonkin, H. B.	Hobart Town
Turnley, G. W.	Launceston
Walch, James	Hobart Town
Waterhouse, R. S.	,,
Weaver, G.	,,
Weston, W. P.	Norfolk Plains
Whitcomb, G.	Hobart Town
Whyte, Hon. James, M.L.C.	,,
Wilson, George, jun.	Mount Seymour

Wilson, Hon. J. M., M.L.C.	Hobart Town
Wise, F. H.	,,
Woolley, J.	,,
Wilkins, A.	England
Webster, A. G.	Hobart Town
Wright, Stephen P. H.	,,
Young, Russell	,,

MINUTES of the ANNUAL GENERAL MEETING of the ROYAL SOCIETY OF TASMANIA, held at the Museum, Macquarie-street, at 7 o'clock p.m., on the 28th January, 1870: T. Giblin, Esq., in the chair.

The following gentlemen, who had been previously nominated by the Council, were, after a ballot, duly elected as Fellows of the Society :— Rev. H. D. Atkinson and Horatio Nelson, Esq.

The CHAIRMAN having read the advertisement by which the meeting had been convened, called upon the Secretary to read the report.

The Report for 1869 was then read.

It was moved by Mr. STEPHENS, seconded by Mr. ABBOTT, and carried, "That the Report be adopted and printed for circulation amongst the Fellows."

Mr. J. W. GRAVES moved a vote of thanks to Dr. Agnew for the very careful and elaborate Report he had drawn up, and he supported the motion by some eulogistic remarks on the services rendered by the Hon. Secretary.

Mr. F. ABBOTT seconded, and the motion was unanimously agreed to.

Dr. AGNEW acknowledged the compliment and said he needed no thanks for what he had done ; he should at all times be ready to exert himself to further the interests of the Society. He referred to the testimonial which the last annual meeting requested him to procure, and reported that when he was in Melbourne, he endeavoured to select something to the value of the sum subscribed. The testimonial which he procured had been submit-

ted for the inspection of the Fellows, and had, he believed, given general satisfaction to the subscribers.

The meeting proceeded to fill up the four vacancies caused by the retiring members of the Council, Messrs. Justin McC. Browne and A. G. Webster being appointed scrutineers.

The following gentlemen were re-elected :—

VEN. ARCHDEACON DAVIES
HON. A. KENNERLEY, ESQ.
M. ALLPORT, ESQ.
J. W. AGNEW, ESQ., M.D.

On the motion of Mr. BARNARD, seconded by Mr. WEBSTER, Messrs. F. Butler and H. Cook, were re-elected Auditors of annual accounts.

A vote of thanks having been passed to the Chairman, Mr. GIBLIN expressed his acknowledgments, and regretted that the meeting had not been favoured with the attendance of the President, or some Vice-President, as he was of opinion that on these annual occasions there ought to be an address from the chair to the members, as was the case elsewhere.

The meeting then terminated.

REPORT.

The Session of 1869 was opened on the 9th March, with a paper by F. Abbott, Esq., F.R.A.S., on the late "Transit of Mercury over the Sun's Disc," and the following papers were read at the monthly meetings during the year:—"Remarks on the Geological Structure of Part of the North Coast of Tasmania, with special reference to the Tertiary Marine Beds near Table Cape," by T. Stephens, M.A.; "On the Manufacture of Beet Sugar in New South Wales," by James Barnard, Esq.; "Nobert's test-plate, Moller's Diatom type slide, and Modern Microscopes," by F. Abbott, Esq., F.R.A.S., F.R.M.S. "Net fishing in the River Derwent," by M. Allport, Esq., F.L.S., F.Z.S. "Notes on the occurrence of gold at Port Cygnet," by T. Stephens, Esq., M.A.

Communications to the Secretary, by E. D. Harrop, Esq., F.R.M.S., of Launceston, on the development of the Fasciola hepatica (Sheep Fluke) and on the Phylactidium pulchellum (one of the confervoid Algæ) were also read by permission of the Council.

The Annual Microscopical Soirée was held on the last evening of the Session, and as the Fellows had the privilege of introducing ladies, a very large number of visitors attended, who were both pleased and interested in the examination of the numerous objects collected for their inspection.

The monthly Meteorological Tables have been regularly published, and copies of them forwarded to the Government observatories at Melbourne,

Sydney, Adelaide, Brisbane, Perth, Western Australia, and Wellington, New Zealand, from all of which places we receive similar returns.

The published papers of the Society have been as usual forwarded to various scientific Societies and individuals in England, America, the neighbouring Colonies and elsewhere, for which liberal returns have been received, especially from America, both from the Government and from the Smithsonian Institution.

COUNCIL.

No vacancy has occurred during the year. The required list according to Rule XXXII., as amended at the General Meeting of 1868, has been exhibited in the Library for the last fortnight.

FINANCE.

In last year's Report the unexpected reduction of the grant-in-aid was referred to. The necessary consequence of this withdrawal of £50 annually has been the contraction of a debt, as it has not been found possible to carry out stricter economy than has hitherto been exercised. We are happy to say our income from subscriptions and arrears contrasts favorably with that of last year, and as Government (in response to an urgent appeal from the Council) has restored the £50 to our grant, we expect to see the debt very considerably reduced at the end of the current year.

Although the Museum grant has been augmented by £50, we are sorry to say the like sum has been deducted from the Garden grant. This is now only £400; a sum for which it is evident these extensive Gardens cannot be attended to in a manner satisfactory to anyone who takes the slightest interest in their proper maintenance.

Our total income (viz., Government Grant, £150 to Museum, £450 to Gardens; subscriptions £150, and sale of plants, &c., £83 11s. 6d.) has been £833 11s. 6d.; which, with £30 12s. in the hands of the Superintendent of the Gardens for payment of current expenses, and about £40 still due for subscriptions, will give a total of £904 3s. 6d. The total expenditure and liabilities amount to £965 1s., leaving to our debit a balance of £60 17s. 6d.

As will be seen by the Balance Sheet, the debt referred to consists chiefly of accounts due to the London Agents. Of these Messrs. Wheatley's is the usual annual account for current literature; the other is an old-standing account of Messrs. Orger and Meryon, of which we are happy to say one moiety has been cleared off during the last two years, leaving at present only £29 5s. 2d. unpaid.

It is only fair to mention that the expenditure for the year (without considering previous liabilities) has been kept within the income, as will be seen by the following figures:—

	£	s.	d.
Total Receipts from all sources	833	11	6
Total Expenditure	830	9	7
Balance	£3	1	11

GARDENS.

About 400 new plants have been introduced during the past year, embracing many of great interest or utility; as *Rhamnus utilis*, from which is prepared the green dye of China; *Carya tomentosa*, White Hickory or Mocker Nut; *Carya oliviformis*, Pecan Nut; *Thea Assamica*, Assam Tea;

Dactylis cæspitosa, Tussac Grass of Falkland Islands; *Fraxinus pendula aurea*, the Golden Weeping Ash; *Jacaranda mimosæfolia*, and *Jacaranda mimosæfolia alba; Dahlia imperialis*, the tree Dahlia which grows to the height of ten or more feet, and is said to be very beautiful when in flower, and *Retinospora ericoides*, from Japan.

Several of the Coniferæ have produced seed for the first time in the colony, during the year. The following are perhaps worthy of especial notice: —*Wellingtonia gigantea*, the mammoth tree of California; *Abies Webbiana*, the purple coned Fir; *Thuja Lobbi; Juniperus Langoldiana; Pinus muricata, pyreniaca, Monspeliensis*, and *Montezumæ*.

About an acre of ground has been trenched, and it is purposed to have it thrown open to the public during the ensuing autumn.

Estimated number of visitors for the year, 22,033.

MUSEUM.

Additions have been made to the Conchological collection from various parts of Tasmania, especially the East Coast. To Dr. J. Cox, of Sydney, we are also much indebted for valuable contributions. For the proper display of these and other specimens, which are continually increasing in number, additional case room is much required.

For the exhibition of our stores of wet preparations a considerable outlay (to which our funds are at present unequal) for glass jars and spirits would be necessary.

Specimens of our Fauna, for exchange, have been sent to the Museums of Magdalen College, Cambridge, and Kentucky. Offers of exchange have also been received from some of the Continental (European) collections. It is only due to

our former Secretary, Dr. Milligan, to refer to the valuable collection of Tasmanian plants presented by him, arranged and scientifically named by Dr. Hooker, of Kew.

As will be seen by the list of donations many additions have been made to the Geological Museum, all of which have been arranged in their appropriate sections; and the general collection has also received many specimens of Birds, Reptiles, Fishes, &c., with other objects of interest. Several skeletons of indigenous animals have been prepared, and will shortly be articulated and mounted for exhibition.

The Museum has been visited by 12,960 persons during the year. This number is almost double that of any previous year—a circumstance to be attributed in a great degree to the interest excited by the exhibition of the salmon smolts caught in October and December last.

STATEMENT of the Funds of the ROYAL SOCIETY for the Year 1869.

RECEIPTS.	£ s. d.	£ s. d.
Annual Subscriptions from 69 Members	103 10 0	
Arrears of ditto	46 10 0	
Total Royal Society		150 0 0
MUSEUM—Grant-in-aid from Treasury	150 0 0	
Total Museum		150 0 0
BOTANIC GARDENS—Proceeds of Sale of Plants, Fruit, &c.	83 11 6	
Grant-in-aid from Treasury	450 0 0	
Total Botanic Gardens		533 11 6
14th Jan., 1870.—Balance overdrawn at Commercial Bank		82 4 4
		£915 15 10
Note.—Dr.—To overdrawn Balance at Bank	82 4 4	
Balance of account due to Messrs. Orger & Meryon, London	29 5 2	
Messrs. Wheatley & Co. account to 31st December (not received), estimated at	20 0 0	
Total		131 9 6
Cr.—By Cash in hands of Superintendent, Botanic Gardens	30 12 0	
Subscriptions due	40 0 0	
Total		70 12 0
Balance to Debit		£60 17 6

EXPENDITURE.	£ s. d.	£ s d.
Balance overdrawn at Commercial Bank, as per statement for 1868		85 6 3
Interest on overdrawn account 1869, as per Bank Book		6 8 7
ROYAL SOCIETY—Meteorological Instruments	2 0 0	
Printing, Advertising, &c.	32 11 11	
Postage, Parcels, &c.	3 5 1	
Collector's Commission, on Subscriptions received, £150 at 5 per cent.	7 10 0	
Messenger for delivering Papers and Proceedings	1 0 0	
Library—Books and Stationery	47 7 3	
Total Royal Society		93 14 3
MUSEUM—Salary of Curator	125 0 0	
Wages of Attendant	52 0 0	
Premium of Insurance	6 7 6	
Purchase of, and preparing Specimens	2 12 6	
Water Rate	3 3 0	
Fuel and Light	3 9 7	
Sundries and Petty Cash	1 0 3	
Camphor, Spirits of Wine, &c.	8 11 9	
Freight and Carriage of Specimens	0 14 6	
Fittings, Repairs, &c.	5 1 1	
Ironmongery, &c.	2 14 8	
Total Museum		210 14 10
BOTANIC GARDENS—Salary of Superintendent	150 0 0	
Wages of Foreman and Labourers	275 19 0	
Tools and Repair of ditto	6 14 1½	
Freight and Carriage of Plants	6 2 3	
Stationery and Postage	2 7 2	
Forage	22 10 0	
Ironmongery, &c.	21 2 1	
Flower Pots	7 5 0	
Sundries	24 1 8½	
Repairs to Buildings	2 0 3	
Seeds	1 10 4	
Total Botanic Gardens		519 11 11
		£915 15 10

Audited and found correct, February 23rd, 1870,
FRANCIS BUTLER, } *Auditors.*
HENRY COOK, }

BOOKS PURCHASED & PRESENTED DURING 1869.

[*Presentations marked thus.**]

Anthropological Society, Memoirs of, Vols. 1 and 2.
*———, Works published by, in 1864-5, 4 Vols.
*———, Catalogue of Books in Library of, 1869.
*———, List of Fellows, 1867.
*Anthropological Review. Nos. 2 to 22. From the Society.
*———Astronomical Register, Nos. 69 to 79. From F. Abbott, Esq.
*———Observations made at Williamstown, Victoria, in 1861-2-3. From Victorian Government.
*Acid, Hydrofluoric, on, by G. Gore, F.R.S. From the author.
Athenæum, The, Parts, 490 to 501, October 1868, to September, 1869.
Arts, Journal of Society of, Vol. 16, Nos. 833 to 844, Vol. 17, Nos. 845 to 884. November 6th, 1868, to October 29th, 1869.
Arts, Transactions of Society of, Vol. 16, bound, 1867-8.
*Association, British, Report of, 1867, bound.
*Agricultural Society of New South Wales, Journal of, Vol. 1, Nos. 6 to 12 ; Vol. 2, Nos. 1 to 4. From the Society.
*Builder, The, Nos. 212 to 225. August, 1868, to September, 1869.
*Boundary Line of New South Wales and South Australia, Determination of. By C. Todd, Esq. From the author.
Botanical Works of the late Robert Brown. Vols. 2 and 3.
*Botanical Discoveries in Australia. Pamphlet by W. Woolls, F.L.S. From Mr. S. H. Wintle.
*Beet Sugar, Manufacture of. MS. By J. Barnard, Esq. From the author.
Conchologia Iconica. Parts 274 and 275 to 280 and 281.
*Colonial Publications, viz., " Derwent Star," 1810 ; six Government orders, 1814 ; promissory note, value 3d., 1824. From F. A. Moore, Esq., Mangalore, Bridgewater.
*Catalogue of Surgical Section, United States Army, Medical Museum. From Government of United States.
*Exhibition, Intercolonial, 1869 (Sydney), Catalogue of. From J. Barnard, Esq.
*Electrograph Pendulum, Description of. By L. R. J, Ellery, Esq., Melbourne Observatory. From the author.
Florist and Pomologist, Nos. 11 to 22. November, 1868, to October, 1869.
*Flora Capensis, Vols. 1, 2 and 3. From Dr. Sonder, Hamburg.
*Fossilen Mollusken. by Dr. M. Hornes. From ditto.
*Fluke Sheep, The, on development of, by E. D. Harrop, Esq., F.R.M.S. From the author.
Gardeners' Chronicle, Nos. 45 to 52, November 7th to December 20th, 1868 ; Nos. 1 to 44, January 2nd to October 30th, 1869.
*Geological Structure of part of North Coast of Tasmania, By T. Stephens, Esq., M.A. From the author.
*Gold, on the occurrence of, at Port Cygnet. By the same. From the author.
*Intelligencer, Walch's Literary, monthly.
Journal, Practical Mechanics. Parts 44 to 55, November, 1868 to October, 1869.
*Journals of House of Assembly, Tasmania, Vols. 5, 8, 12, and 16. From Government.
*——— of Legislative Council, Vol. 4. From ditto.
Journal, Quarterly of Science, Nos. 21 to 24, January to August, 1869.
Journal of Science, Silliman's American, Vol. 46, No. 138, to Vol. 49, No. 143,
*Law, Reign of, Argyle's. From Dr. Milligan.
Magazine, Country Gentleman's, Vol. 1, No. 5 to 9 ; Vol. 2, Nos. 10 to 12. Vol. 3 Nos. 13 to 16, November, 1868, to October, 1869.
*Mining Surveyors and Registrars, Victoria, Report of 31st December, 1868. From Government of Victoria.
Magazine of Science and Art (Sydney), Vol. 2, 1859.

*Meteorological Observations made at Hobart Town by F. Abbott, Esq., F.R.M.S., &c. Monthly Tables for 1869.
*————————————Port Arthur, from J. Boyd, Esq., ditto, ditto, ditto.
*————————————Swansea, from Dr. Story, ditto, ditto.
*————————————Westbury, from C. Belstead, Esq., ditto, ditto.
*———————————— from King's Island, Swan Island, Goose Island, Kent's Group, Mount Nelson, and South Bruni. From the Hobart Town Marine Board.
*Meteorological Observations, New Zealand, printed tables January to October, 1866 : Report 1868 ; Observations 1868. From Government of New Zealand.
————————————, Brisbane, January to July 1869, monthly tables; Summary for 1868. From Government of Queensland.
————————————, Perth, Western Australia, ditto June to October, 1869. From W. J. Knight, Esq.
————————————, New South Wales, ditto, January to December, 1866
————————————————————, Printed tables 1865-6. From Government Observatory.
*———————————, Melbourne, ditto April to December, 1869, From Government Observatory.
*————————————, Adelaide, ditto for December, 1868.
Natural History, Annals and Magazine of, Vol. 2, Nos. 11 and 12 ; Vol. 3, Nos. 13 to 18 ; Vol. 4, Nos. 19 to 22.
Naturgeschichte, Archiv fur. No. 6, 1866 : Nos. 4 and 5, 1867.
*New Zealand, Abstract Report of Geological Survey of, 1868–9. From N.Z. Government.
*Nobert's Test Plate, &c., by F. Abbott, Esq., F.R.A.S., F.R.M.S. From the author.
*Net Fishing in the River Derwent, by M. Allport, Esq., F.L.S., F.Z.S. From the author.
*Proceedings of Royal Society, London, Vol 16, Nos. 95 to 104; Vol. 17. Nos. 105 to 113 ; Vol. 18, No. 114. From the Society.
*———— Royal Institution of Great Britain, Vol. 5, Part 1, No. 45, Part 2, No. 46.
*———— Essex Institute, Salem, Massachusetts, U.S.A., Vol. 4 ; and parts 1 and 2, Vol. 5.—Naturalists' Directory, No. 1.
*American Philosophical Society, Philadelphia, Vol. 10, No. 76.
*———— American Academy of Arts and Sciences, Boston, U.S., Vol. 6.
*Phylactidium pulchellum—On growth and development of, by E. D. Harrop, Esq., F.R.M.S.
*Report of Mining Surveyors, &c., Victoria, to 30th September, 1869. From Victorian Government.
*———of Registrar General, Victoria, December 1868 and March 1869. From ditto.
*———, Annual, of Secretary of War, Washington, United States, 1866.
———On Epidemic Cholera, being Circular No. 6 of Surgeon General's Office, Washington, U.S.
———, Inaugural, of Cincinatti Observatory, June 1868.
——— of Leeds Literary and Philosophical Society, 1868–1869.
———, 7th Annual, of Inspectors of Salmon Fisheries, England and Wales. From J. A. Youl, Esq.
Student, The, Nos. 10 to 21, Nov. 1868, to Nov. 1868.
*Society, Royal Geographical, London, Proceedings of, Vol. 12, Nos 2 to 5 ; Vol. 13, No 1, and slips of meetings.
———————— Journal of, Vol. 37, 1867.
*Society, Linnean, Journal of, Vol 9, No. 40 ; Vol. 10, Nos. 41 to 45, (Zoology) Vol. 9, No. 44 ; Vol. 10, Nos. 45 to 48,—Vol. 11, No. 49, (Botany).—From the Society.
———, Geological London, Quarterly Journal of, Vol. 24, Parts 2, 3, and 4, Nos. 94 to 96 ; Vol. 25, Pt. 1, Nos. 97, 48. From the Society.
————————————List of, 1868.
*———, Royal Asiatic, Journal of, Vol. 3, Parts 1 and 2. From the Society.

*Society, Zoological, of London, Proceedings of, Parts 2 and 3, May to December, 1867, March to June, 1868.
*——, ————, Index to Proceedings, 1848 to 1860.
*——, ————, Report of, 1868.
*——, Boston (United States), of Natural History, Vols. 7 and 10, Vol. 11, Nos. 1 to 6.
*—— ————, Memoirs of, Vol. 1, Parts 1 and 2.
*——, Royal, of N. S. Wales, Transactions of, Vol. 1.
*Statistics of New Zealand, 1867 and 1868. From N. Z. Government.
*———— of Victoria for 1867 and 1868; general index to ditto. From Victorian Government.
*Survey, Geological, of Victoria, Maps, 1 vol. From Sir Robert Officer.
*Smithsonian Institution, Washington, United States, Report for 1865. From the Institution.
*———— Contributions to Knowledge, Vols. 6 and 7. From the same.
*Tasmanian Industries—Pamphlet by J. E. Calder, Esq. From the Government.
*Transits of Venus in 1774 and 1882, Observations on. By G. B. Airey, Esq., Astronomer Royal. From the author.
*Transactions of New Zealand Institute, 1868. From the Institute of Institution of Engineers in Scotland, Vols. 1 to 12 (1857 to 1868.) From the Institution.
*———— of Philosophical Society of New South Wales, 1862-5. From the Society.
*———— of Society of Naturalists, Hamburg. From the Society.
Vertebrata, Structure and Development of Shoulder Girdle and Sternum in. By W. K. Parker, Esq., F.R.S. (*Ray Society's Volume for* 1867.)

LIST OF OBJECTS PRESENTED TO THE MUSEUM DURING 1869, WITH NAMES OF DONORS.

Allport, M., Esq., F L.S., F.Z.S.—Gelatinous tube of Salpa, and small Crustacean found within it. From Adventure Bay. Two fish, name unknown, caught at Wedge Bay.
Aubin, F., Esq.—A Sun-Fish (*Orthagoriscus sp.*), from Spring Bay.
Bennett, Dr.—A Crab from Sandy Bay.
Bilton, H., Esq.—A double head of Calf. Curious growth of root of tree.
Barnard, J., Esq.—A Package of Seed of Sugar Beet for distribution. Specimens of Cinnabar ore from the Cudgegong, New South Wales.
Bomford, F. E., Esq.—Specimens of Fluke (*Distoma sp.*) from Liver of a Shark.
Buckland, Mrs. J. R.—A Bullet from a double-barrelled gun, found loaded, on the 30th May, 1859, by the side of two skeletons belonging to the retreating party of Sir John Franklin's expedition, in a boat on the west coast of King William's Island, lat. 69deg. 8min., N., long. 99deg. 24min., W. [Vide "Fate of Franklin and His Discoveries," by Captain McClintock, page 294.] A portion of a Boat's Ensign, belonging to the same expedition, left at the Northern Cairn, Cape Felix, May, 1847, and discovered May, 1859, by Lieut. Hobson, of Lady Franklin's screw yacht Fox. A portion of the Riband of the Order of the Redeemer, of Greece, worn by the late Sir John Franklin. An Almond from the Convent Garden on Mount Sinai.
Cox, Dr. J., Sydney.—Sixty-seven specimens of Shells. A large number of Shells from various parts of the world.
Castray, L. R., Esq., A.C.G.—A letter in the New Zealand language, addressed by one native to another, with translation. Six specimens of Woods from Madagascar.

Castray, Miss.—Leaves of Silver Leaf Tree, from Table Mountain, Cape of Good Hope; a Damara Lady's Necklace, from South Africa.

Clifford, Mr. G. P., Dunedin.—Two Limestone Boulders *(Septaria)* from Moeraki Beach, New Zealand

Dyer, Mr. R. T.—An albino variety of the Rosella Parrot (*Platycercus eximius.)*

Dear, Rev. R. E.—Specimens of Iron Ore and laminated Quartz. A number of stone implements of the Aborigines collected by Mr. Rollings, of Forcett.

Dinham, Mr. G.—Two Fossil Shark's Teeth from the Lias, near Bath, England.

Edwards, Miss S. P.—Specimens of Salpa found at sea on the passage from England. Eleven Copper Coins and Tokens.

Exton, Mr. W., Oatlands.—An Owl *(Strix castanops.)*

Edgar, Mr. J. C., Sorell.—Seven specimens Land Shells.

Ferguson, P., Esq.—A Letter of the Chetty Merchants *(Tamils)*, of Southern India and Ceylon, with an explanatory note.

Gooch, Mr. G, F.—A small Silver Coin.

Gellibrand, W. A. B., Esq. —A female specimen of the native Tiger *(Thylacinus cynocephalus).* Photographs of Machinery in Leeds Exhibition.

Gates, Mr., Jerusalem.—A Black Cockatoo.

Glover, Mr.—Fifteen Geological Specimens from West Coast of Tasmania.

Guichard, M. H., ship La Somme.—One Bronze Coin, five cents; one Silver ditto, five cents, Napoleon III., 1862.

Garth, Captain.—An Albatross (*Diomedia exulans.)*

Hannaford, S., Esq.—Specimen of Sipunculas from Corio Bay, Geelong. An Ostracion. Two Seeds of Trappa Bicornis from China.

Heron, M. C., French ship La Somme.—Two copper coins, colony of Cayenne, Louis XVI., 1789. One ditto Republic of Berne, 1796.

Hull, H. M., Esq.—A Key-hole Limpet; a Chiton; a Magpie Perch; a Malay Kris; three small Fish.

Hedberg, Mr. Oscar.—A collection of Shells from East Coast of Tasmania.

Holmes, Mr. F.—Portion of Skin of Whale tanned.

Harrop, E. D., Esq., Launceston.—Four mounted specimens of Sheep Fluke *(Fasciola hepatica.)*

Hull, J., Esq.—A Falcon *(Falco melanogenys).*

Johnston, W., Esq., Trinity Hill.—A Boomerang and Waddie from Queensland; a Spear from New Hebrides; a large Seed, said to have been taken from the stomach of a Barracouta; four Coins, and one Brass token.

Jones, Mr. J.—A small Turtle from Lady Elliott's Island.

Kelly, Mr. J.—A Shilling of Queen Anne, 1707, and a Danish Coin, 1771. A Brass Basin (Indian).

Knight, Mr. W., jun.—A collection of Geological Specimens brought by Mr. Glover from the western coast of the Island.

Krefft, G., Esq., Sydney Museum, per M. Allport, Esq.—Five Bird Skins from King George's Sound.

Legrand, Mr.—Specimens of new species of Helix *(Helix Allporti.* Cox.) Two ditto of *Bulimus Tasmanicus.*

Luttrell, Mr. G.—Shell impressions from Port Cygnet.

Milligan, Dr., London.—Seven packages dried Tasmanian Plants, named by Dr. Hooker. Two ditto of Italian plants. Six specimens of *Calymene Blumenbachii* from Wenlock Shale, Gotland. Specimen of Esparto Grass, for paper making.

McLaren, Mr.—A cluster of Barnacles from piles of wharf.

Manley, Miss S. A.—Four specimens of *Chamostrea* from Carlton beach.

Maclaine, J., Esq., Clarke's Island.—An Avocet *(Recurvirostris rubricollis.)*

Meredith, Hon. C., Esq.—Two specimens of Silver Fish from Prosser's Bay.

Meredith, Mrs. C.—Specimen of Australian Coot *(Fulica Australis,)*

McRa, Mr. H.—Three Geological Specimens from Bothwell. A stone implement of the Aborigines.

Mitchell, Mr., Sandy Bay.—A Basket and Necklace made by Aborigines of Tasmania.

Maclanachan, J., Esq.—A Hen Golden Pheasant. A Pheasant (a cross between English and Chinese varieties.) One ditto.
Maning, A. H., Esq.—A Sun Dial made and used by Spanish shepherds.
Nichols, Captain T.—Skeleton of a Fish from Howe's Island.
New, Mrs.—A Brown Trout *(Salmo fario)* caught in the Bagdad Creek.
Officer, Sir R.—A White Hawk.
Propsting, R., Mr.—A Swamp Hawk *(Circus assimilis.)*
Peck, Miss.—An English Barn Owl *(Strix flammea)*, prepared and mounted.
Rollings, Mr., Sorell.—A Jade Chisel from New Zealand. A stone implement used by Tasmanian Aborigines for skinning Kangaroo, &c.
Ransome, Mr. R., Southport.—Specimen of Felspar Porphyry, and the ear-bone of a Whale.
Ransley, Mrs.—A Lizard with double tail.
Rossitor, Mr.—Specimen of the Maori Hen of New Zealand. An English Partridge. Three bones of foot of Moa *(Dinornis sp.)*
Roblin, Mr.—A Black Cockatoo *(Calyptorhynchus xanthonotus.)*
Room, Mrs., Launceston.—A half Rupee.
Roberts, Captain.—A Snake and three large Centipedes.
Swan, J., Esq.—Skeletons of Forester and Brush Kangaroo.
Swan, E. D., Esq.—Polished specimen of Fluor Spar from Derbyshire, England.
Salmon Commissioners.—A Salmon Smolt caught in the Derwent.
Stagg, Mrs.—Eight Limestone Fossils *(Tasmanian.)*
Stephens, T., Esq.—A Kingfisher *(Alcyone sanctus)* from Southport.
Swift, Mr. A. H., Little Taylor's Bay.—Two specimens of Hæmatite from Point Ventinat.
Swan, E. D., Esq.—Nest and egg of *Epthianura albifrons* from Cornelian Bay.
Story, Dr., Swansea.—Skeletons of Wedge-tailed Eagle, Crane, Bandicoot, &c.
Seymour Coal Company.—Slab of Shale with plant impressions, from Seymour Mines. Specimen of Coal from West Wanganui Inlet, New Zealand.
Taylor, Mr. A. J., New Norfolk.—A Copper Coin of French Republic.
Townsend, Mr. J.—Specimens of calcareous incrustations on roots of plants, from sandy beach at Pittwater.
Thomas, Mr. W. J.—A large specimen of Native Bread *(Mylitta Australis.)*
Turner, Mr. H.—An Irish Penny, and a Sydney token.
Wintle, Mr. S. H.—A vegetable impression in Shale from Mount Wellington *(Endogenophylites Wellinglonensis.* McCoy.) A cluster of plant impressions from Claystone. Fragments of Shale with impressions of plants, from New Town. Specimen of *Pholas* from Sandy Bay. A Gall Fly and nest; also a smaller species with its larva. Seventeen named specimens of Tasmanian Coleoptera. Specimen of Cleithelepis from New South Wales, discovered by the Rev. W. B. Clarke. A mineral specimen from the Mudstone, Huon Road.
Whitely, Mr.—A Silver Coin, 10 cents, Netherlands, 1849.
Walch, Mr. J. H. B.—A Shilling of Queen Elizabeth; a Farthing of George II., 1741; a Copper Coin of French Republic (L'an 5); ditto of one of the Roman Emperors.
Whitcomb, G., Esq.—Samples of Coal from Lambton Colliery, Newcastle, and Bituminous Shale from Hartley, New South Wales. A sample of Sugar Cane grown in Queensland.
Wilkinson, F. B., Esq.—A Mountain Duck *(Casarca tadornoides).*
Williams, Captain.—Sample of Mineral Water, from Spring Bay. Tail of Tunny.
Young, Mr. J.—Eight specimens of Crustaceans.

PLANTS AND SEEDS RECEIVED AT THE ROYAL SOCIETY'S GARDENS DURING 1869.

February 10th.—From the Acclimatisation Society, Christchurch, New Zealand.—Two packets Seeds.
February 20th.—From Mr. C. F. Creswell.—Nine packets Seeds, eleven species tuberous plants received from England.
March 2nd.—From Mr. C. F. Creswell.—Eighteen first-class new Dahlias.
April 5th.—From Mr. T. C. Wren, Mount Hobson Nursery, Remuera, New Zealand.—One Case containing 24 plants.
April 5th.—From the Melbourne Botanic Gardens.—One Case containing 14 plants.
June 15th.—From Mons. Verschaffelt, Ghent, Belgium.—One Case containing 48 plants, of which 33 were alive and 15 dead; one Bundle containing 106 varieties fruit, of which 43 were alive and 63 dead.
June 25th.—From Mr. G. Brunning, St. Kilda Nurseries, Melbourne.—One Case containing 60 plants.
June 25th.—From Mr. Joseph Harris, South Yarra Nurseries, Melbourne.—One Case containing 47 plants.
June 25th.—From the Melbourne Botanic Gardens.—One Case containing 29 plants.
July 14th.—From Mr. E. B. Heyne, Seedsman, Adelaide.—28 packets seeds.
July 16th.—From Mr. S. Clifford, Dunedin, New Zealand.—Five plants Cyathea.
July 21st.—From the Ven. Archdeacon Davies.—Twenty-two varieties Pelargonium seed.
July 27th.—From Mr. James Jones, Melbourne.—Two packets seeds.
August 20th.—From the Melbourne Botanic Gardens.—One Case containing 18 plants.
September 4th.—From Messrs. Taylor and Sangster, Toorak Nurseries, Melbourne.—One Case containing 16 plants.
November 10th.—From Mr. Robert Young, Gipps Land.—One packet Pittosporum seed.
November 23rd.—From Mr. C. F. Creswell.—Six packets seeds.
December 21st.—From Joseph Milligan, Esq., London, favoured by Captain Lulham.—48 packets seeds.
December 24th.—From Messrs. Taylor and Sangster.—One Case containing 59 plants.

PLANTS AND SEEDS SENT FROM THE ROYAL SOCIETY'S GARDENS DURING 1869.

February 27th.—To Mons. A. Verschaffelt, Ghent, Belgium.—One packet Seeds.
March 24th.—To the Melbourne Botanic Gardens.—Lot Box Cuttings.
March 30th.—To the Sydney Botanic Gardens.—One Case containing 40 plants.
May 8th.—To J. W. Newman, Esq., Adelaide.—One Box containing 25 plants.
May 25th.—To Mr. Joseph Harris, Nurseryman, Melbourne.—One Case containing 44 plants and 26 papers seeds.
May 26th.—To Messrs. Taylor and Sangster, Toorak Nurseries, Melbourne.—Thirty-six varieties Bulbs.
June 16th.—To Mr. G. Brunning, St. Kilda Nurseries, Melbourne.—One Case containing 54 plants and 12 packets seeds.
September 9th.—To Messrs. Taylor and Sangster, Toorak Nurseries.—Nine packets Conifer Seeds.
September 28th.—To Mr. S. Clifford, New Zealand.—One Case containing 25 plants.
December 20th.—To the Sydney Botanic Gardens.—One Case containing 40 plants.

PLANTS SUPPLIED FOR THE DECORATION OF PUBLIC PLACES DURING 1869.

For Government House Grounds.—Ninety plants.
For decoration of the grounds of Cascade Invalid Depôt.—Forty Cypress plants, eighty Trees and Shrubs, and thirty six Herbaceous Plants.
For the grounds of Church of England, Campbell Town.—Thirty-six plants.
For Castray Esplanade.—Seventy plants.

F. ABBOTT, JUN.,

Superintendent R. S. Gardens.

PLANTS INTRODUCED INTO THE ROYAL SOCIETY'S GARDENS DURING 1869.

Alseuosmia quercifolia
Anemone apennina
,, fulgens
,, Narcissifolia
Aralia Sieboldtii
Aristolochia gigantea
Asclepias Douglassii
Bellevalia ramosa
Bobartia aurantiaca
Bomaria multiflora
Buxus latifolius
Caloscordium nerinifolium
Campanula Elatineæ
,, Hohenekeri
Carya oliviformis
,, tomentosa
Cestrum Palqui
Chelone barbata Torreyi
Chorizema diversifolia
,, soulangeana
,, spectabilis
Citriobatus microphyllus
Claytonia perfoliata
Corokia buddleoides
Cotoneaster laxiflora
Cosmus bipinnatifidus
Crocus chrysanthus
,, nivalis
Cummingia bulbocodium
Cuphea purpurea Kermessina
Cussonia thyrsiflora
Dactylis cæspitosa
Datura fastuosa Huberiana
Dahlia imperialis
Delphinium Madame Rougiere
,, Queen of England
Dianella Media
Draba Bætica
Ehretia acuminata
Enothera Drummondi nana
Epimedium alpinum
,, grandiflorum
,, pinnatum
Erica baccans
,, calycina major
,, Margaritacea
,, persoluta
,, Plukenetii
,, tetralix
Erica tubiflora
,, vulgaris
,, Willmoreana
Esculus rubro atrosanguinea
Fraxinus pendula aurea
Galanthus plicatus
Galaxia Germanica
Gentiana lutea
Gesnera Princei
Gossipium Sturtii
Habranthus Andersonii
Hepatica angulosa
Hoheria populnea
Hydrangea japonica
Ipomæa filicifolia
Iris reticulata
Ismene sp.
Jacaranda digitaliflora
,, digitaliflora alba
Jasione humilis
Jubæa spectabilis
Lilium Takesume
,, testaceum
Linaria alpina
,, tripartita superba
Lobelia Cardinalis Q. Victoria
,, fulgens purpurea
Melicytus lanceolatus
Merendera bulbocodium
Mesembryanthemum Tegens
Narcissus juncæfolius
Ornus rotundifolius
Oxalis tropæoleoides
,, valdaviana
Passiflora Jumbo
Pentstemon glabra
,, Lobbi
Phenocoma prolifera
Pithocolobium umbrosum
Pinus patula
Pimelia diosmæfolia
Plagianthus Lyalli
Podocarpus dacrydioides
Polygonatum verticulatum
Prunus sinensis rosea
Psidium album
Retinospora ericoides
,, plumosa
Rhabdothamnus Solandri

Rhamnus utilis
Sagus ruffia
Saxifraga Fortunii
Scilla umbellata
Scizostylis coccinea
Sericographis Ghiesbrightiana
Silene alpestris
Solanum acanthocarpum
Spiræa umbrosa
Swainsonia Greyana carminea
Syringa Charles X.
Taxodium Sinensis
Terminalia Bellerieri
Thea Assamica
,, viridis
Thujaopsis lætevirens
Tydea venosa
Ulmus campestris aurea variegata
Ulmus Montana Vegeta
,, Sinensis aureus variegatus

FERNS.

Adiantum Cunninghamii
,, Capis veneris
,, formosum
,, nigrum
,, pubescens
Aneimia fraxinifolia
Aspidium molle
,, Sieboldtii
Asplenium Adiantum nigrum
,, attenuatum
,, ebenum
,, falcata
,, flabellifolium
,, flaccidum
,, laxum
,, trachominoides
Blechnum Braziliensis
,, gracile
Cyathea medullaris
,, dealbata
Davallia canariensis
,, Giberosa
Diplazium Twaitsii
Doodia aspera
,, caudata
,, caudata confluens
Gleichenia microphylla
Gymnogramma sulphurea
Leptopteris hymenophylloides
,, superba
Lomaria Pattersonii
,, pumila
Lycopodium cæsium violaceum
,, umbrosum
Lygodium articulatum
Maraltia salicina
Niphobolus lingua
,, rupestris
Pellæa rotundifolia
Platyloma falcata
Polypodium angustifolium
,, glaucum
,, paradasiaca
,, vaceolens
Pteris cretica
,, cretica alba lineata
,, japonica
,, longifolia
,, pinnata
,, rotundifolia
,, scaberula
,, semipinnata
Scolopendrium officinarum
Trichomanes elongatum
,, reniforme
Zinniscium serratum

TREE PÆONIES.

Pænia Moutan Avocat Guillon
,, Cardinel Antonelli
,, Dyonidii
,, George Rollison
,, Germanica
,, lactea
,, Mde. Guidebach de Raes
,, odorata plenissima
,, papaveracea fimbriata
,, papaveracea albo pleno
,, Professor Morren
,, Victoria Superba

ROSES.

Achille Gonad
Alfred Colomb
Alpaide de Rolatier
Beauty of Waltham
Countesse de Barbautaume
Evêque des Nismes
François Lacharme
Heroine Vaucluse
John Keynes

La Duchesse de Morny
Louis XIV.
Madame Roussett
Marguerite Bonnet
Model of Perfection
Prince Leon
Princess Mary of Cambridge
Princess of Wales
Rushton Radcliff
Souvenir de W. Wood
Senateure Favre

PELARGONIUM.

Belle of the Ball
Fantastic
Fair Rosamond
High Admiral
John Hoyle
Magnet
Rosa Bonheur
Royalty
Regularity
The Prince

GERANIUM.

Arab
Autocrat
Beauty of Europe
Clio
Crystal Palace Gem
Crimson Queen
Cybister
Dr. Hogg
Enchantress
Ephraim
Excellent
Gaiety
Gloire de Nancy
Golden Pheasant
Jason
Luna
Legrand
Mangle's silver variegated
Model
Monte Rosa
Prince Imperial
Purple Queen
Rival Stella
Sambo
St. George
Triumphans
Triumph de Lorraine
Waltham Nosegay

FUCHSIA.

Arabella
Bland's florabunda
Conquest
Diadem
Favourite oi Fortune
Lady Heytesbury
Mrs. Gladstone
Rose of Denmark

VERBENA.

Beauty
Daylight
Empress
Ensign
Eugenie
Gipsy Queen
Lion Hunter
Mary Ann
Miss Mary Law
President
Queen Victoria
Ringleader

DAHLIA.

Andrew Dodds
Angelina
Bessie
Chairman
Constance
Caroline Tettrell
Chameleon
Compacta
Delicata
Flower of the Day
Golden Pheasant
Grand Sultan
Hebe
Lady Derby
Leopardess
Lord Derby
Lord Fielding
Memorandum
Miss Manners-Sutton
Miss Turner
Mrs. Crisp
Mrs. Dodds

Mrs. Piggott
Mont Blanc
Nora Creina
Princess Radcliff
Prince of Russia
Purple Gem
Queen Mab
Queen of Whites
Rosy Queen
Summertide
Sparkler
Sir Greville Smythe
Tiffany
Viceroy
White Standard
Wonderful

APPLES.

Annat Scarlet
Beauty of Wilts
Blenheim Pippin
Bull's Golden Reinette
Coccagee
Ingestrie Yellow
Lodgemore Nonpareil
Magnum Bonum
Nelson's Codlin
Nonsuch Paradise
Pine Apple Russet
Prizetaker
Rick's Nonsuch
Rosemary Russet
Striped Beaufin.

PEARS.

Bell de Bruxelles
Kingsessing
Trillington

PLUMS.

Early Prolific
Guthrie's Late Green
Siegel's Apricot

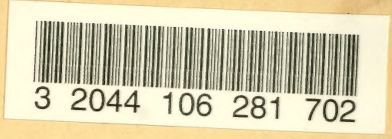
STRAWBERRY.

Cockscomb

F. ABBOTT, JUNR.,

Superintendent R. S. Gardens.

PRINTED AT THE "MERCURY" STEAM PRESS OFFICE.


3 2044 106 281 702