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PROCEEDINGS

OF THE

NATURAL HISTORY SOCIETY OF DUBLIN,

FOR THE

SESSION 1866-67.

VOLUME V.—PART II.



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SESSION 1866-7.

ANNUAL GENERAL MEETING, THURSDAY EVENING, NOVEMBER 1, 1866.

ROYAL IRISH ACADEMY HOUSE, DAWSON-STREET.

DAVID MOORE, Ph. D., F. L. S., M. R. I. A., President, in the Chair.

READ, the Minutes of the preceding General Meeting, which were confirmed.

The Ballot was then opened for Council and Officers for the coming Session. Professor E. Perceval Wright and Mr. W. B. Brownrigg having been appointed Scrutineers,

The Report of the Council was then read, as follows:—

“Another Session of our now somewhat venerable Society terminates, and a new one begins to-night. At the close of the Session which is now bygone, your Council cannot return to your hands the trust confided to it without expressing a hope for an unlimited continuation of the vigour and steady progress which have hitherto marked the career of our Society.

“During the past year seventeen Ordinary Members have been added to the list, including two Associates who became Ordinary Members; whilst the losses have been three, by resignation.

“Last year botanical science suffered a heavy loss in the death of two of its most illustrious representatives in the sister country—Sir W. J. Hooker and Dr. Lindley. This year an Irish botanist, no less distinguished, has been removed from amongst us. It would ill become this Society, at this Meeting, inaugurating a new Session, to omit to place on record the unfeigned regret of its Members at the death of Professor W. H. Harvey. Dr. Harvey, at the time of his death, was not a Member of this Society—indeed, his increasing delicacy of late years forbade his leaving his house at night; but in his more active days Dr. Harvey took a long and an energetic part in this Society. He was some time its President, and always looked upon it with much interest. Of the late Professor's long scientific labours it is unnecessary to speak—they are a ‘monumentum ære perennius;’ nor of his geniality and amiability—they will be remembered by all who had the pleasure of his acquaintance; nor of his humour and abilities in fields other than those appertaining to his Professor's Chair: those who knew him further than in the latter capacity will readily call to mind how much of these enviable qualities were his. We here, Members of the Natural History Society of Dublin—recognising fully the many high qualities, scientific and personal, of the late Professor—bearing in mind the long years of intercourse which he had with this Society—would simply desire to place on record our high esteem for him when living, and our vivid

sense of the loss which Science has sustained by his removal in the midst of his labours and activity.

“The Papers read during the Session have been nineteen in number—fourteen zoological, three botanical, and one palæontological, in two parts. The zoological were—‘Notes on *Colias edusa*,’ by Dr. E. Perceval Wright, F. L. S.; ‘Notes on Irish Lepidoptera,’ by William Andrews; ‘Occasional Notes on the Occurrence of Rare Birds on the Shores of the River Moy and Killala Bay,’ No. IV., by R. Warren, Jun.; ‘Natural History Notes,’ by G. H. Kinahan; ‘On the Possibility of Naturalizing the Ringed Snake (*Tropidonotus natrix*) in Ireland,’ by Dr. E. H. Bennett; ‘On the Occurrence of *Oxyuris ambigua* in the Alimentary Canal of the Porcupine (*Hystrix cristata*),’ by Dr. John Barker; ‘On some Bones of the Dodo,’ by Dr. E. Perceval Wright; ‘On some Remarkable Muscles in Monkeys,’ by Dr. Alexander Macalister; ‘On Trawling,’ by W. Andrews; ‘On *Scotopelia Peli*,’ by Dr. E. Perceval Wright; ‘On a Case of Injury of the Brain, and consequent Paralysis in a Monkey,’ by the Rev. Samuel Haughton, M. D., F. R. S.; ‘Catalogue of the Lepidoptera of Ireland,’ by Edwin Birchall; ‘Notes on Salmon-hatching,’ by G. H. Kinahan; ‘On the Subdivisions of the Terebridæ,’ by Dr. E. Perceval Wright. The botanical were—‘Description of a New Species of Bulbochæte, Ag.,’ by William Archer; ‘On the Occurrence of *Hymenophyllum Wilsoni* in the Neighbourhood of Boyle,’ by F. J. Foot; ‘Addenda to the Musci and Hepaticæ of “Flora Hibernica,” with additional Habitats for a few of the rarer Species,’ by Dr. D. Moore, F. L. S., President. The palæontological Paper was the following:—‘On Fossil Plants from the South of Ireland—Parts I. and II.,’ by W. H. Baily, F. G. and L. SS.

“The foregoing will appear in the forthcoming Part of the Society’s publication, with two or three plates. The demands for the back numbers of our Proceedings on the part of foreign Societies to complete sets have become numerous; but these are nearly all, unfortunately, out of print. Your Secretaries will, of course, duly see that a sufficient number of copies are printed in future to supply all demands, and to prevent the likelihood of the Parts getting, as heretofore, completely out of print.

“The exchange of Publications with English and foreign kindred Societies has been duly maintained, and proposals for the opening up of mutual relations in this regard have come from some additional Societies. To them, and to all who generously forward to this Society their valuable publications in return for the comparatively very little in the form of a *quid pro quo* which we have to offer, your Council would beg to present best and sincere thanks. Nevertheless, we of this Society are not, your Council trusts, too humble, each in his way, to value these gifts, nor too ungrateful to accept them thankfully. Would that some British Societies were not so chary of their illustrated publications; would that they would act on the foreign principle, that these are published, at large expense, it is true, but still, it is to be presumed, for the purpose that the original matter therein should be as widely as possible diffused. A complete list of the Publications received up to No-

vember last was given in the preceding Part of the Proceedings. Those received during the past Session will, as heretofore, be duly enumerated in the Appendix to the forthcoming Part.

“Your Council would reiterate the wish that more original contributions from observers, even though not Members, should find their way to this Society; and it is believed that vigorous efforts should be made to devote as much of the funds of the Society as possible to bringing out the Journal in a complete and creditable manner, not only as regards printing and extent, but also as regards illustrations. Your Council would wish to see our Journal the creditably got up, efficiently illustrated, well-filled, and widely-circulated common embodiment of all the labours of observers in the varied fields of Natural History in Ireland—the general medium for the diffusion of the result of the united labours of Irish naturalists. This is ‘a consummation devoutly to be wished.’ Is it not one quite feasible, and capable of realization? There does not seem any reason why the Society should not number two or three hundred on its roll. If it did so, then it would be sufficiently easy to answer the query just propounded in the affirmative.

“The Museum last year received a few accessions, and still remains in your Treasurer’s charge.

“The state of the funds of the Society will appear from the Treasurer’s Report.

“The Meetings, as of late years, have been held in the Royal Irish Academy House, by kind permission of its Council; and for this kind accommodation, as heretofore, the best thanks of this Society are due.

“And so, with the end of the old, begin we to-night a new Session. May the coming one lack none of the activity and diligence of its predecessors, but rather may every succeeding annual review of the state and doings of our Society be capable of being truly, if briefly, summarized in the words, ‘Vires acquirit eundo!’”

On the motion of the Rev. Eugene O’Meara, seconded by Mr. Maziere Johnston, the foregoing Report was unanimously adopted.

The Treasurer then read his Report, showing a considerable balance in favour of the Society.

Mr. George Dixon and Mr. J. J. Lawlor were appointed Auditors to examine the accounts.

The Ballot was then declared closed, whereupon

Mr. Archer, one of the Honorary Secretaries, presented a large number of donations of the publications of English and foreign Scientific Societies, received in exchange; and the best thanks of the Society—proposed by Dr. J. Barker, and seconded by Mr. Dawson—were voted to the several donors.

On the motion of Mr. R. P. Williams, seconded by the Rev. Eugene O’Meara, the thanks of the Society were unanimously voted to the Council of the Royal Irish Academy for the kind permission accorded to this Society to hold its meetings in the Academy House.

The Scrutineers then reported the result of the ballot for Council and Officers for the ensuing Session, and declared the following had been elected :—

PRESIDENT.—Robert Callwell, M. R. I. A., V. P. R. G. S. I.

VICE-PRESIDENTS.—William Andrews, M. R. I. A., F. R. G. S. I.; Alexander Carte, M. D., F. R. C. S. I., F. L. S., M. R. I. A., F. R. G. S. I.; C. P. Croker, M. D., M. R. I. A., M. B. S. Edin.; R. Palmer Williams, M. R. I. A., F. R. G. S. I.

COUNCIL.—H. M. Barton, F. R. G. S. I.; John Barker, M. D., F. R. C. S. I., M. R. I. A., F. R. G. S. I.; E. H. Bennett, M. D., M. C., F. R. C. S. I.; George Dixon, F. R. G. S. I.; A. W. Foot, M. D., L. R. C. S. I.; John Good, F. R. G. S. I.; Rev. Samuel Houghton, M. D., F. T. C. D., F. R. S., V. P. R. G. S. I.; A. H. Jacob, M. D., L. R. C. S. I.; Maziere Johnston, John J. Lalor, Alexander Macalister, L. K. Q. C. P., L. R. C. S. I.; David Moore, Ph.D., F. L. S., M. R. I. A.; Rev. Professor O'Mahony.

HONORARY TREASURER.—Arthur Andrews.

HONORARY DIRECTOR OF MUSEUM.—W. B. Brownrigg, F. R. G. S. I.

HONORARY SECRETARIES.—Robert M'Donnell, M. D., F. R. C. S. I., F. R. S., M. R. I. A.; William Archer.

On the motion of Dr. A. W. Foot, seconded by Professor E. Perceval Wright, a vote of thanks was proposed to Dr. Moore, ex-President, for his kindness and courtesy in the chair during his year of office as President, and for his watchful interest over the well-being of the Society, which was passed by acclamation.

Dr. Moore briefly returned his best thanks for the honour done him in having been elected President of the Natural History Society of Dublin, an honour which he fully appreciated. He now relinquished the chair to a worthy successor, than whom none stood higher in estimation, and than whom none, he felt sure, had the interest of the Society more at heart.

The Meeting then adjourned to the first Thursday in December.

DECEMBER 6, 1866.

WILLIAM ANDREWS, M. R. I. A., Vice-President, in the Chair.

Read the Minutes of the preceding Meeting, which being approved, were signed.

Read the following Paper :—

NOTES ON THE FLORA OF THE ISLANDS OF ARRAN, WEST OF IRELAND. By E. PERCEVAL WRIGHT, M. D., F. R. C. S. I., F. L. S., Lecturer on Zoology, Trinity College, Dublin, and on Botany to Dr. Steevens' Hospital Medical School.

THE Islands of Arran are situated at the mouth of the Bay of Galway, and extend from N. lat. $53^{\circ} 0'$ to $53^{\circ} 9'$, and from W. long. $9^{\circ} 31'$ to

9° 52'. From the town of Galway, the little harbour of Kilronan is distant about twenty-eight miles. The group consists of three large islands—Inishmore, Inishmaan, and Inisheer—and of several smaller ones, such as the Brannock Islands, to the north-west of Inishmore.

The largest island is about eleven miles distant from the nearest mainland, at Cashla Bay, in the county of Galway; but Inisheer is not much more than five or six miles from the cliffs of Moher, in the county of Clare.

The village of Kilronan, situated on the west side of Killeany Bay, boasts of a sufficiently comfortable hotel.

The islands consist of carboniferous limestone, forming on their south-western sides high frowning headlands, which in some places are arranged in a series of terraces, and in some as high precipitous cliffs. On the north-eastern side of the islands, facing Galway Bay, there will be found a series of coarse shingly beaches, interrupted here and there by several sandy bays. The ground rises on Inishmore, near the Ogvil Fort, to a height of 406 feet; and the cliffs at Corker and Dunængus rise to a height, respectively, of 234 and 279 feet. The highest point of Inishmaan—the middle island—is 275 feet; and the south island, or Inisheer, rises to a height of 202 feet. A vast extent of sand hills covers the eastern side of Killeany Bay, running out towards the north-east as far as Illaunatee, or Straw Island.

A few little streams are to be met with, chiefly in Inishmore; and wells of good water are not unfrequent.

The surface of the larger island rises in a series of broad terraces, the level portions of which present the appearance of a vast number of gigantic tombstones—some very long and narrow, others broad and short. The interspaces between these layers of stone are never more than from an inch to eighteen inches in width; but it is in these interspaces, between these immense blocks of stone, and also on the faces of the terraces, that almost all the plants on the islands are to be found.

Dry stone walls abound everywhere, and are erected chiefly for protection from the winds, which are almost always blowing on these islands. These walls often enclose spaces of but a few yards square, but by their help some small crops are sown and garnered. Potatoes are planted on the bare rock, the tubers being covered over with a basketful of dried seaweed, and then a basketful of earth. In some few places the rock gets by degrees covered over with a thin sod, which, with the help of manure, yields in some seasons a scanty crop of oats or barley, and in other seasons supplies a precarious nourishment of sweet grass to a few sheep brought from the mainland.

The chief employment of the islanders is in the gathering and burning of kelp, and many of them are engaged in the sea fisheries.

A good mountain road runs from Killeany through Kilronan, westward, as far as the ruins of Templebreacan; but collecting on any of the Islands is a matter of some difficulty; for, once off the main road, the abrupt sides of the terraces are often too steep to be climbed, and the constant jumping over wide stone walls becomes particularly trying.

Having spent some pleasant days along the coast at Roundstone investigating the botany of that portion of Connemara, we left the pier of that village in a hooker, belonging to the monastery of Roundstone, about eight o'clock in the morning of the 3rd of August. The wind was blowing very sharply from the north-west, and the moment we left the shelter of the land we encountered its full force. We were speedily in the following predicament—either having to row back in the teeth of the gale, or taking the chance of our frail mast snapping if we sailed away before it. Our men preferred the latter alternative, and with sail half set, and every third or fourth wave washing completely over us, we bore away for Golam Head, and then across the North Sound, arriving in safety, but in a very sorry plight, into the shelter of Killeany Bay, after a run of five hours, and taking up quarters at the "Atlantic Hotel." The well-meaning proprietors of this little tavern did everything in their power to make us as comfortable as possible. Except on stormy days, fish abounded at our table, chiefly John Dorys, and once, during our sojourn of eleven days, a sheep was killed on the island, and we had mutton for dinner.

It would be well for the botanist who thinks of visiting these interesting Islands to bring with him, either from Clifden or Galway, a few creature comforts to supplement the meagre fare of the place; and above all, if he intend to write, or to work with the microscope after sunset, to bring with him a store of good candles. The sufferings that the writer endured while trying to investigate with a half-inch objective some gatherings made near the Holy Well at Kilronan, were indeed great, the only choice of light being between a farthing dip-candle of the worst description—i. e. with the thickest possible wick and the smallest amount of tallow—and a slender cotton thread lying in a saucer of fish oil.

The fresh-water gatherings were examined by my friend Mr. W. Archer, and among them he discovered *Hydrocoleum thermale* (Kütz.), which exhibited a curious modification of the oscillatoriaceous movement common to the group; for the filaments, confined in the common tube, glided up and down past one another—a movement very different from the ordinary vibration or spiral twisting, so characteristic of the group.

A large collection of Diatoms made on this occasion has been examined by another friend, the Rev. E. O'Meara, and he informs me that it is the most interesting that he has ever examined: not only is it very rich in well-known forms, but he believes he has, on an examination of only a small portion of the entire gatherings, discovered many new species, and others, though not new species, yet such as have not been detected hitherto in Great Britain or Ireland.

These diatomaceous gatherings were made for the most part off the forest of algæ that will be found between the strand at Porrermore, in Killeany Bay, and the projecting promontory of shaly rock that juts out into the bay below the village of Killeany. They were found adhering to the fronds of *Desmarestia ligulata*, *Chordaria flagelliformis*, &c.

The season was too far advanced for many of the characteristic Arran Islands plants; still a good number of species were met with.

Adopting the nomenclature of that important contribution to Irish botany, the “*Cybele Hibernica*” of Dr. Moore and Mr. More, the following list contains the names of the species met with:—

Ranunculus tricophyllus (Chaix), in some quantity near Bungowla, Inishmore.

R. heterophyllus (Sibth.), *R. aquaticus*, var. Bentham.

R. hederaceus (Linn.) *R. aquaticus*, var. Bentham.

R. lingua (Linn.), on the shore of the small Lough Atalia. Inishmore.

R. acris (Linn.)

R. repens (Linn.)

R. bulbosus (Linn.)

Aquilegia vulgaris (Linn.), growing apparently quite wild in several places on the large island.

Quite a colony of this species was found on the north-west side of the island near Sheskra.

Papaver dubium (Linn.), on cultivated land in the vicinity of the villages.

Fumaria officinalis (Linn.)

[*Matthiola sinuata* (R. Br.) This species is mentioned in the “*Flora Hibernica*” as taken on Straw Island, to the east of Killeany Bay.

I looked for it, but did not succeed in finding any trace of it.]

Nasturtium officinale (R. Br.)

Arabis hirsuta (R. Br.), not uncommon on Inishmore.

A. ciliata (R. Br.), Inishmore.

Sisymbrium officinale (Scop.)

Cochlearia officinalis (Linn.)

Thlaspi arvense (Linn.)

Senebiera coronopus (Poirot). This species is not met with commonly in the islands, but it grows in great profusion all about the villages of Kilonan and Killeany, and appears to me to have been introduced with the turf which the inhabitants import from the Connemara district.

Cakile maritima (Scop.)

Crambe maritima (Linn.), Trawmore, Inishmore.

Raphanus maritimus (Sm.), *R. raphanistrum* (Linn.), var. Bentham. Inishmore.

Reseda luteola (Linn.)

Helianthemum canum (Dun.)

Viola sylvatica (Fries).

Polygala vulgaris (Linn.)

Silene maritima (With.), *S. inflata* (Sm.), var. Bentham, growing in great abundance on the rocky shores of all the islands.

Sagina procumbens (Linn.)

S. maritima (Don.)

S. subulata (Wimm.). I gathered specimens of this species near Kilonan.

In the “*Cybele Hibernica*” this name is misspelt Kilmoran.

- S. nodosa* (E. Meyer).
Alsine verna (Jacq.)
Stellaria media (Linn.)
Cerastium glomeratum (Thuil.), *C. vulgatum* (Sm.), *C. arvense* (Linn.)
 Inishmore and Inishmaan.
Lavatera arborea (Linn.), in the neighbourhood of several of the cottages
 at Killeany, and elsewhere.
Hypericum humifusum (Linn.)
H. pulchrum (Linn.)
Geranium sanguineum (Linn.)
G. molle (Linn.)
G. lucidum (Linn.)
G. robertianum (Linn.)
Erodium moschatum (Sm.), growing in the greatest profusion all along
 Killeany Bay.
Trifolium pratense (Linn.)
T. repens (Linn.)
Lotus corniculatus (Linn.)
L. major (Scop.)
 [*Astragalus hypoglottis* (Linn.), is recorded in "Flora Hibernica" as
 from Arran, but was not found, though looked for.]
Vicia cracca (Linn.). Inisheer.
Prunus communis (Huds.) It is curious to find small trees of this
 species growing in the clefts between the limestone rocks; they
 sometimes grow out from between the rocks; but the heavy winds in
 the winter time keep them on a level with the surface of the
 ground.
Poterium sanguisorba (Linn.)
Potentilla anserina (Linn.)
P. reptans (Linn.)
P. tormentilla (Nestl.)
Fragaria vesca (Linn.)
Rubus cæsius (Linn.)
R. saxatilis (Linn.), very common amid the rocks everywhere on
 the largest island.
Geum urbanum (Linn.)
Rosa spinosissima (Linn.)
Epilobium hirsutum (Linn.). A few plants were met with in the damp
 ground to the west of Inishmore.
Hippuris vulgaris (Linn.)
Sedum rhodiola (D. C.) This plant grows in great profusion on the
 south-west end of Inishmore.
S. anglicum (Huds.)
S. acre (Linn.)
Saxifraga hypnoides (Linn.). In some exposed places a dense tufted
 variety of this species is met with.
Eryngium maritimum (Linn.)
Apium graveolens (Linn.), in the neighbourhood of Kilonan.

- Helosciadium nodiflorum* (Koch).
H. inundatum (Koch). Both these species were met with in some marshy ground, near Bungowla, on the west of Inishmore.
Pimpinella magna (Linn.), between Kilronan and the Roman Catholic chapel.
Crithmum maritimum (Linn.)
Daucus carota (Linn.)
Torilis anthriscus (Goert.)
T. nodosa (Goert.), at the foot of stone walls; very common in the islands.
Anthriscus sylvestris (Hoffm.)
Smyrniolum olusatrum (Linn.)
Hedera helix (Linn.)
Cornus sanguinea (Linn.), very common amid the crevices of the rocks on Inishmore, and apparently truly wild.
Sambucus ebulus (Linn.), on the west side of Inishmore in some quantities; but in suspicious connexion with the ruins of that portion of the island.
Asperula cynanchica (Linn.)
Galium boreale (Linn.)
G. verum (Linn.)
Rubia peregrina (Linn.), very common in some parts of Inishmore and Inishmaan.
Aster tripolium (Linn.)
Bellis perennis (Linn.)
Achillea millefolium (Linn.)
Chrysanthemum leucanthemum (Linn.)
C. segetum (Linn.), only in two or three cultivated portions of ground in Inishmore.
Artemisia absinthium (Linn.)
Senecio vulgaris (Linn.)
S. jacobæa (Linn.)
S. aquaticus (Huds.), west end of Inishmore.
Carlina vulgaris (Linn.), very common on all the islands.
Centaurea nigra (Linn.)
C. scabiosa (Linn.)
Carduus nutans (Linn.), near the Seven Churches, on Inishmore.
C. tenuiflorus (Curt.)
C. arvensis (Curt.)
Silybum marianum (Gaert.), on the western side of Inishmore. Some magnificent specimens measured $5\frac{1}{2}$ feet in height.
Apargia autumnalis (Willd.)
Leontodon taraxacum (Linn.)
Sonchus arvensis (Linn.)
Campanula rotundifolia (Linn.) This species grows in immense profusion in all suitable places in Inishmore.
Calluna vulgaris (Salisb.)
Erica cinerea (Linn.)

- Erythræa centaureum* (Pers.)
Gentiana campestris (Linn.)
G. verna (Linn.)
Convolvulus soldanella (Linn.)
Solanum dulcamara (Linn.), growing in shingly ground on the north-west side of Killeany Bay, and on the south-west of Inishmore, near Doonaghard and Dunaengus.
Orobanche hederæ (Duby.) Plentiful on ivy, growing up between the rocks, about Kilonan.
Verbascum thapsus (Linn.), on the west end of Inishmore.
Pedicularis palustris (Linn.)
P. sylvatica (Linn.)
Euphrasia officinalis (Linn.)
E. odontites (Linn.)
Veronica anagallis (Linn.)
V. beccabunga (Linn.)
V. chamædryis (Linn.)
V. officinalis (Linn.)
Mentha aquatica (Linn.)
Thymus serpyllum (Linn.)
Calamintha officinalis (Moench.) occurs in some quantity.
Prunella vulgaris (Linn.)
Lamium purpureum (Linn.)
Stachys sylvatica (Linn.)
S. palustris (Linn.)
Marrubium vulgare (Linn.). This species grows in great quantities on the south island (Inisheer); and not always in the vicinity of the small villages.
Ajuga reptans (Linn.)
 [*A. pyramidalis* (Linn.) has been found near Kilonan by my friend Dr. Moore.]
Primula vulgaris (Huds.)
Lysimachia nemorum (Linn.)
Anagallis arvensis (Linn.)
A. tenella (Linn.)
Glaux maritima (Linn.)
Samolus valerandi (Linn.)
Armeria maritima (Willd.)
Plantago coronopus (Linn.)
P. maritima (Linn.)
P. major (Linn.)
Littorella lacustris (Linn.), growing in some little muddy pools on the west side of Inishmore.
Salsola kali (Linn.)
Suaeda maritima (Dum.)
Chenopodium album (Linn.)
Beta maritima (Linn.)
Rumex conglomeratus (Murr.)

- R. obtusifolius* (Linn.)
R. acetosella (Linn.)
Polygonum amphibium (Linn.), wet places to the west of Inishmore.
Euphorbia paralias (Linn.), growing in profusion on the Trawnmore sand banks.
E. peplus (Linn.)
Callitriche verna (Linn.), growing on borders of wet ground with *Littorella lacustris*.
Parietaria officinalis (Linn.)
Urtica urens (Linn.), only met with in the immediate neighbourhood of Kilronan.
U. dioica (Linn.)
Humulus lupulus (Linn.), near the ruins of Templebreacan.
Juniperus communis (Linn.), common over the hilly district of Inishmore.
Orchis pyramidalis (Linn.)
O. mascula (Linn.)
Gymnadenia conopsea (R. Br.), very common on Inishmore.
Habenaria viridis (R. Br.). On the limestone district of Arran this species is not rare.
Spiranthes autumnalis (Rich.)
Allium babingtonii (Bor.). This species is to be met with very generally in all the islands. In Inishmore it will be easily found at Eararna, to the south-east, and at Ourtnagapple in the west.
Lemna minor (Linn.)

It is not of course to be supposed that this list gives the names of all the species to be met with on the Islands of Arran. A residence of some seven or eight months on the islands, or frequent visits to them during some such period, would be requisite to enable one to do this with anything like completeness; but I believe it to be a list of all, or almost all, the species to be met with in the month of August, and it is sufficient to enable one to compare the Flora of this group of islands with that of the opposite mainlands. These mainlands are—first, that of the Connemara district, in the county of Galway; and, secondly, that of the Burren district in the county of Clare. The former of these districts is the south-west portion of District 8, of Professor C. C. Babington,* and the latter is portion of the western part of District 6. At first sight it might not be thought possible, to say to which of these two districts the Arran Islands belonged; but, on examination, the general affinity of the Flora is seen to be to that of the Clare rather than to that of the Galway coast; so that Arran may be regarded as but the extension of Clare, at least from a geological point of view.

* "Proceedings of the Dublin University Zoological and Botanical Association," vol. i., p. 246, and "Cybele Hibernica," by Dr. Moore and A. G. More, 1866, p. xxxi.

In Mr. F. J. Foot's very interesting paper* "On the Distribution of Plants in the Burren District," he describes part of this district as consisting of bare rocky hills, which seem at first sight quite devoid of vegetation, and the desert-like aspect thus imparted to the landscape has caused it to be compared to parts of Arabia Petræa. The rock is traversed by different systems of joints, which form innumerable fissures in the flat beds, and on a close inspection it is found that all the chinks and crevices, caused by these joints and the action of rain, are the nurseries of very many plants, the disintegration of the rock producing a very rich productive soil. Almost the very same words might be used in reference to the Arran Islands, the general aspect of these islands presenting a very strong contrast indeed with the boulder-strewn surface of the Connemara district, with its innumerable small loughs and deep pools. Some sufficiently remarkable plants are found in both the Connemara district and on the Islands of Arran—such as *Gentiana verna*, *Allium babingtonii*, *Adiantum capillus-venoris*, &c.; but nearly all that might be thus cited are equally found on the islands and on the opposite Clare coast; and we have at least the following, which, not found in District 8, are equally common or rare on the Burren and the Arran coasts:—*Helianthemum canum*, *Ajuga pyramidalis*; and again many plants met with in the Connemara district, are not found either in Clare or Arran.

The season was not too far advanced for leguminous plants, and I could not but be struck by their absence. I did not meet with a single plant of *Ulex Europæus* or *Ononis arvensis*; and in Mr. Foot's list of Burren plants I find only two of the Leguminosæ recorded—*Lotus corniculatus* and *L. major*. Two common trefoils and the common tufted vetch were all that rewarded my search at Arran.

On the west and most exposed side of Inishmore many plants commonly met with were remarkable for their peculiar stunted growth: thus the Samphire (*Crithmum maritimum*), which grows in the greatest abundance, was found in full flower, and yet the little miniature plants were not more than three inches in height. Plants of *Sedum rhodiola* were also met with not more than $2\frac{1}{2}$ inches high. Such plants were invariably found growing out from the chinks between the stones.

A dwarfed condition of growth was not, however, by any means the rule; for not to allude to the gigantic flowering stems of *Allium babingtonii*, which, under favourable circumstances, reach to a height of from five to six feet, nor to the fronds of *Adiantum capillus-venoris*, some of which I have found twenty inches long, specimens of *Verbascum thapsus* were met with nearly five feet high, and covered with the richest pubescence, and in at least one instance a small colony of that fine thistle, *Silybum marianum*, was seen, some of the flowering stalks of which were five feet four inches in height.

*Transactions of the Royal Irish Academy," vol. xxiv. Science, Part III., Dublin, 1864, p. 143, *et seq.*

The inhabitants are indebted altogether to the mainland for their supply of fuel, and this supply comes in the form of turf from the immediate neighbourhood of Roundstone and Bertraghboy Bay. To this circumstance I am inclined to ascribe the appearance of patches of such plants as *Senebiera coronopus* and *Urtica urens* about the villages of Kilronan and Kilmeany.

The following species are enumerated as additions to the Flora of District 6:—

Ranunculus heterophyllus (Sibth.), var. *trichophyllus* (Chaix).

Sisymbrium officinale.

Cochlearia officinalis.

Apium graveolens.

Silybum marianum.

Suæda maritima.

Salsola kali.

A list of the principal detached papers relating to the Flora of Ireland is given in the Preface to the "Cybele Hibernica," pp. viii. to xiii., and in it will be found references to the papers by Mr. W. Andrews, Dr. D. Moore, F. L. S., Mr. Leslie Ogilby, and Professor D. Oliver, F. R. S., on the Flora of the Arran Islands.

In conclusion, and as some slight apology for the incompleteness of the above Notes on the Flora of the Arran Islands, I may mention, that they were made under very disadvantageous circumstances, as, save for one day, the weather during the whole of my sojourn at Kilronan was, even by the natives, considered very bad. Heavy rains all night and until the forenoon, strong gusts of wind continually driving in from the west or north-west, made collecting and drying plants oftentimes a work of difficulty; still, however small, I trust these Notes may be considered as a contribution towards making our knowledge of the distribution of the Irish Flora complete.

Dr. Moore said he would not detain the meeting at that late hour by any lengthened remarks on the paper Dr. Wright had just read, which contained much interest for those who studied the Flora of this country, as well as for those who studied the geographical distribution of plants in the British Isles. Hitherto it had been too much the custom for authors of papers on similar subjects to mention the names of the plants only which they had observed when on such botanical rambles as Dr. Wright had given a sketch of this evening; but he had treated the matter in a more philosophical manner, by first giving us an account of the geological structure of those outlying islands, compared with the formations on the nearest coasts of the mainlands of the counties of Galway and Clare, with a further comparison of the plants growing on the Arran Isles and adjacent coasts. In this way an extensive field for reasoning on the subject was opened up. He has ably pointed out that the Flora of Arran partakes more of that

on the Clare coast than it does of Galway, though the latter is so much nearer to those isles. It certainly is a remarkable circumstance that such plants as the maiden hair fern, *Adiantum capillus-veneris*, *Helianthemum canum*, and *Ajuga pyramidalis* should grow on the coast of Clare, opposite the Isles of Arran, and in the Isles also, but nowhere else in Ireland, with the exception of the fern, which has been seen in very small quantities in one or two other places. When compiling the work lately published, "Contributions to a Cybele Hibernica," Dr. Moore and his colleague had always found Dr. Wright most willing to give them every assistance in his power, and his name would be found quoted as an authority for several of our rarer plants. It would, however, have been referred to much oftener had it not been that Dr. Wright always preferred to see the names of younger collectors mentioned rather than his own.

After which was read the following paper:—

ON SOME NEW DIATOMACEÆ COLLECTED BY DR. E. PERCEVAL WRIGHT OFF THE LARGE ISLAND OF ARRAN. By the REV. EUGENE O'MEARA, A. M.

THE paper I submit to your notice is an appropriate sequel to that which has been read this evening by Dr. E. Perceval Wright. It was his task to record the higher plants collected by him in the Arran Islands in August last; it is mine to describe the diatomaceous forms discovered by me in a marine gathering made off those islands.

The matter supplied to me, of which only a small portion has as yet been searched, was raised, as Dr. Wright informed me, from depths varying from 5 to 10 fathoms; and, taking into account the number and variety of the species found in it, this gathering may be regarded as one of the most interesting ever made—certainly the most interesting ever made in Ireland.

Some of the common marine species are met with. For instance:—

<i>Actynoptychus undulatus.</i>	<i>Nitzschia plana.</i>
<i>Amphitetras antediluviana, var. β.</i>	„ <i>sigma.</i>
<i>Biddulphia aurita.</i>	<i>Pleurosigma decorum.</i>
<i>Coccinodiscus radiatus.</i>	„ <i>formosum.</i>
„ <i>minor.</i>	„ <i>quadratum.</i>
<i>Campylodiscus Ralfsii.</i>	„ <i>strigosum.</i>
<i>Eupodiscus crassus.</i>	<i>Rhabdonema arcuatum.</i>
<i>Grammatophora marina.</i>	<i>Stauroneis pulchella.</i>
„ <i>serpentina.</i>	„ „ <i>var. β.</i>
„ <i>maculata.</i>	<i>Synedra Gallionii.</i>
<i>Isthmia enervis.</i>	<i>Tryblionella marginata.</i>
<i>Navicula didyma.</i>	

It is a remarkable fact that the above-named species are relatively few, and the forms belonging to them, generally speaking, are not of frequent occurrence.

Besides the common forms just enumerated, I have found a large number of the rarer species described by Donkin, Gregory, Greville, and Roper—investigators in this department of natural science whose discoveries have been made known since the publication of Smyth's "Synopsis of British Diatomaceæ," namely—

Amphiprora maxima (Greg.)	Coscinodiscus nitidus (Greg.)
Amphora sulcata (Roper).	Navicula Henedyi (Greg.)
" robusta (Greg.)	" æstiva (Donkin).
" obtusa (Greg.)	" forcipata (Grev.)
" arenaria (Donkin).	" hyalina (Donkin).
Cocconeis pinnata (Greg.)	" nitida (Greg.)
" pseudo-marginata	" clavata (Grev.)
(Greg.)	" lineata (Donkin).
" Grantiana (Grev.)	" prætexta (Grev.)
" scutellum, var. γ	" maxima (Grev.)
(Roper).	Pinnularia pandura, var. elongata
Campylodiscus simulans (Greg.)	(Greg.)
Coscinodiscus concavus (Greg.)	" semiplena (Grev.)

As regards the forms included in the foregoing list, I have no remark to make beyond the record of their occurrence, except in the case of *Campylodiscus simulans* and *Coscinodiscus nitidus*. Several frustules of *Campylodiscus simulans* have occurred in the gathering, and in many instances I have observed the same peculiarity which Dr. Gregory noticed in the frustules of *Campylodiscus bicruciatius*, namely, that the opposite valves are frequently placed at right angles to each other.

Coscinodiscus nitidus is figured and described by Dr. Gregory, in his paper on "New Forms of Diatomaceæ found in the Firth of Clyde," and supposed by him to be the same as a form previously figured from an imperfect specimen found in the Glenshira Sand. In the paper on the Clyde forms Dr. Gregory, having described *Coscinodiscus nitidus*, proceeds to say:—"This pretty disk was figured, without a name, from an imperfect specimen in my last paper on the Glenshira Sand.* Having found it tolerably frequent in Lamlash Bay, I now figure a perfect example, which provisionally I refer to *Coscinodiscus*."

This form found in Lamlash Bay occurs frequently in Dr. Wright's gathering, and with equal frequency is another form very like it at first inspection, but which, on closer examination, presents distinctive characters. This latter appears to me identical with that figured from an imperfect specimen in the paper on the Glenshira Sand. A careful comparison of many frustules seems to confirm this opinion. The Clyde form is accurately described as follows:—"Surface of the disk marked with distant and irregularly radiated lines of rather large, round, distant

* "Transactions of the Microscopical Society," vol. v., Pl. 1, Fig. 50.

cells or granules; the rays are distinctly marked towards the margin, but somewhat confused towards the centre; puncta or granules larger towards the centre than at the margin." In the other form the rays are distinctly marked throughout the entire length, some of them reaching the centre, others terminating at some distance from it, and others extending but a short distance from the margin. The granules forming the rays are considerably smaller than those of the other species referred to, and the central ones are scarcely larger than those at the margin.

For these reasons, I consider the two forms should be regarded as distinct species, and suggest that from henceforth the name *Coscinodiscus Gregorianus* be given to the form found by Dr. Gregory in the Glen-shira Sand.

I now proceed to mention a fact deserving of special attention, namely this, that *Tessella interrupta*, *Euphuria pulchella*, and forms belonging to the genus *Hyalodiscus* and *Omphalopelta* have been met with in this gathering. These species have been discovered in distant parts of the world, but, so far as I can learn, have not hitherto found a place in the list of British Diatoms.

But the number of forms which, so far as I can ascertain from the sources of information available to me, have not been hitherto described, constitutes the most interesting feature of this valuable collection. Some of those I shall hold over for further examination, and now submit for your consideration a few of these new forms, with their descriptive characters.

Navicula Hibernica.—N. sp., O'M., Fig. 1. Broadly elliptical; length, .0041; breadth, .0024; striæ very fine, confined to a narrow marginal band; parallel to the median line there is a broad band, without striæ, linear, interrupted at the central nodule, constricted towards the ends, and rounded; the central portion of the valve granulated.

This pretty form is closely allied to *Navicula indica* (Grev.), but has not the mammiform apices, nor the lyrate blank spaces of that beautiful species.

Navicula pellucida.—N. sp., O'M., Fig. 2. Length .0036; breadth, .0013, constricted; striæ very fine, confined to a very narrow marginal band; short towards the ends and the central constriction; the inner part of the valve smooth, pellucid at either side of the median line, divided into two compartments by a longitudinal curved line.

The front view constricted, marked at the centre and ends by bead-like nodules.

Navicula denticulata.—N. sp., O'M., Fig. 3. Length of valve, .0034; breadth, .0013; deeply constricted; striæ costate rather than moniliform, marginal, with a narrow striate, longitudinal band close to the median line, the interspaces blank.

Probably this form belongs to the Pinnulariæ; but although the reasons assigned for merging the latter family in the Naviculæ seem scarcely satisfactory, I feel disposed to fall in with the tendency in this direction when the form presents the general characteristics of the Naviculæ. This species bears a striking resemblance to *Navicula Egyptiaca*,

described by the late lamented Dr. Greville in the last number of the "Microscopical Journal." *Navicula denticulata*, however, is distinguished from that just referred to by the following characters:—It is much shorter and broader, the marginal striæ are longer, the central striæ are nearer to the median line, and continuous, instead of being interrupted towards the central nodule, as in the case of *Navicula Egyptiaca*.

Navicula Wrightii.—N. sp., O'M., Fig. 4. Valve broadly elliptical; length, .0041; breadth, .0024; striæ fine, marginal; there is a broad band at either side of the median line, linear, interrupted towards the central nodule, slightly constricted as it approaches the marginal band of striæ, and then expanding towards the apex, which is mammiform. This longitudinal band is destitute of striæ.

On first inspection, this form is liable to be mistaken for *N. Henedyi*; but it is distinguished from it, not only by its mammiform apices and the spatulate extremity of the longitudinal median band, but also by the fact that in the present species this band is blank, while in *N. Henedyi* it is striate.

A variety of this species is described in Fig. 4, *a*, much smaller than the other, and having the sides nearly parallel; length, .0020; breadth, .0014.

Navicula amphoroides.—N. sp., O'M., Fig. 5. Valve elliptical, narrow; length, .0032; breadth, .0014. In this form the central nodule is depressed, and the median line waved; striæ moniliform, in the middle approaching the central nodule, and becoming gradually shorter towards the extremities.

Pinnularia Arraniensis.—N. sp., O'M., Fig. 6. Valve broadly elliptical; length, .0030; breadth, .0017; striæ coarse, distinctly costate, not reaching the median line.

In some respects this form resembles *Navic. Smithii* and *Navic. æstiva* (Donk.); but differs from the former by its distinctly costate striæ; and from the latter, by the coarseness of its striæ, as also by the fact that it is much broader in proportion to its length than *N. æstiva*.

Pinnularia divaricata.—N. sp., O'M., Fig. 7. Broadly elliptical, costate; length, .0058; breadth, .0035; the ends slightly produced and rounded; the central space large, with an outline resembling the vertebra of a fish. Through this space there runs a well-marked median line, very fine at the outward extremity, and becoming broader towards the centre, at some little distance from which it terminates in a small bulb. The costæ are arranged concentrically with the apex at either end for about one-third the length of the frustule, while those in the intermediate portion spring from the margin of the central nodule; the central costa runs at right angles with the longitudinal axis, and those at either side radiate towards it more and more as the distance from this line increases; the costæ in the central part of the valve are furcate; in some the furcation appears near the outer margin of the valve; in others near the central nodule; some few are bifurcate.

It is worthy of notice that in some aspects the costæ appear as if they were slightly notched by longitudinal lines, which, though they produce a furrow, do not sink so deeply as to give a moniliform character to the sculpture of the valve.

Pinnularia constricta.—N. sp., O'M., Fig. 8. Valve elliptical; length, .0044; breadth, .0014; central nodule depressed; costæ distant, nearly reaching the median line, except at the central nodule; in front view constricted, linear.

Pinnularia forficula.—N. sp., O'M., Fig. 9. Valve broadly elliptical; length, .0021; breadth, .0014; in the middle is a blank space, curved, constricted at the central nodule, and towards the apices from each side converging to a point. The striæ are distinctly costate, and longer at the middle than towards the apex.

This form closely resembles in its outline *Navicula Smithii*, var. *suborbicularis*, described by Gregory in his paper on the Diatomaceæ of the Clyde, but is distinguished from it by its costate striæ.

Surirella pulcherrima.—N. sp., O'M., Fig. 10. Length, .0046; breadth, .0037; broadly elliptical, ends symmetrical, and nearly lanceolate; the border narrow, the central area wide, elliptico-lanceolate, and striate at the margin; canaliculi about 15 on either side, at first narrow, then expanding towards the outer margin, the narrow part short and robust; alæ conspicuous.

Surirella gracillima.—N. sp., O'M., Fig. 11. Length, .0055; breadth, .0037; ends symmetrical, and broadly rounded; canaliculi about 24 on either side, slightly radiate, narrow at first, and expanded towards the outer margin; the narrow portion long, the expanded part first rounded, and at a short distance from the junction slightly constricted, and gradually enlarging till it approaches the margin, when it terminates in a rounded end, separated from the next one by a very small space; outer margin finely striate, as is also the margin of the central area, which is elliptical; alæ not conspicuous.

The following paper was then read:—

ON A NEW STATION OF HYMENOPHYLLUM WILSONI AND H. TUNBRIDGENSE.
By F. J. FOOT, M. A., F. R. G. S. I.

CONSIDERING it to be highly interesting and important as regards distribution to note the occurrence of such local plants as the species of *Hymenophyllum*, I beg to bring before the notice of the Society this evening a station of both species of that genus, which I believe to be hitherto unrecorded. It is on Slieve Anierin Mountain, in the county of Leitrim, which lies at the side of Lough Allen. Slieve Anierin (the iron mountain) is 1922 feet above the level of the sea, and 1720 feet above the lough; it is composed of the black coal-measure shales, surmounted by beds of white and light yellowish brown, hard quartzose grits, some of which are conglomeritic, and often pass into

good conglomerates, consisting of quartz pebbles in a compact sandy base. These grits form a bold escarpment, two miles or so in length, and facing the south-east; interstratified with them are some thin seams of coal, which were at one time worked. The top of the hill is a rolling moor, abounding in grouse and hares. The *Hymenophyllum* grows on the conglomerates. It was first observed by my friend Mr. James Butler, R. M., of Boyle, who mentioned the circumstance to me, and kindly conducted me to the place. There was one particular spot where we found it growing in the greatest abundance; this was in the townland of Barnameenagh,* half a mile south of the summit, at a height of 1700 feet or so above the sea. Here the conglomerates and grits are nearly horizontal, or dip slightly to the north-west. They are traversed by little ravines and gorges, and deep gullies, worn out by weather and rain. It is extremely beautiful to look down into these deep gullies, with their walls tapestried and their floors carpeted with a rank vegetation, consisting of liverworts, mosses, and ferns, their different shades of green contrasting most exquisitely. Conspicuous among them are the unusually large fronds of *Hymenophyllum Wilsoni* and *H. Tunbridgense*, the size being due to the shade and moisture of the locality. These ferns may here be gathered mingled in mats of almost any size. In a short time we collected as much as would carpet a small room. It was very rarely in fruit, which is generally the case in shady places, but there was enough to make sure of both species. I am not aware that the *Hymenophyllum* has been hitherto recorded from the coal-measure formation, though there is no reason why it should not occur there. At all events, conglomerate seems to be its favourite rock, whatever may be its geological age. This new station is also interesting, as extending the range of the plant. I sent some fine specimens to Dr. Moore, who has at my request brought some of it here to verify my record.

Dr. Moore said, in reference to Mr. Foot's paper, that it was a matter for congratulation that Mr. Foot continues his observations on the rarer plants he meets whilst prosecuting his geological researches, and embodies them from time to time in notes which he sends us. At some future period these notes, as published in our "Proceedings," will become useful for some future compiler of our Irish Flora. With regard to the luxuriant examples mentioned by Mr. Foot, now on the table, it will be observed that both our native species, *Hymenophyllum Wilsoni* and *H. Tunbridgense*, are mixed together in the mass—hence the more luxuriant appearance, *H. Tunbridgense* being a larger plant, when it grows freely, than *H. Wilsoni*. Both plants were in fruit, consequently easily distinguished from each other.

* Ordnance Sheet 21, Leitrim.

After which the following paper was read :—

NOTICE OF THE OCCURRENCE IN IRELAND OF TWO PLANTS NEW TO THE IRISH FLORA, *ERIOPHORUM ALPINUM* AND *ACORUS CALAMUS*. By DAVID MOORE, Ph. D., F. L. S.

I HAVE to-night the pleasure to produce specimens of *Eriophorum alpinum*, which were found growing in considerable abundance on the north margin of Gurthavahra Lake, three miles west of Millstreet, county of Cork, last October, by Henry J. Ryder, Esq. The specimens were sent to me by Mr. John Sullivan, of the Queen's College, Cork, who received them from the discoverer, Mr. Ryder. This is probably the most interesting plant which has been added to the Irish Flora for many years. Hitherto the only habitats known for it in the British Isles are two, both of which are in Scotland, one near Forfar, the other near Sutherlandshire. In the former it has disappeared, in consequence of the lakes having been drained where it grew. The new Irish locality will, therefore, be looked upon with much interest by British botanists. In Lapland and Norway it grows on low bogs and marshes, and in De Candolle's "Botanicum Gallicum," it is stated to grow in "paludosis vogesorum jurassi Alpium," &c. The county of Cork station is, therefore, intermediate, though the most westerly in Europe. It is also found in North America.

I have also to record another plant of nearly equal interest which has been discovered during the present year in the north of Ireland, the sweet flag, *Acorus calamus*. The discovery of it is due to Mr. Stewart, of Belfast, who has of late years investigated the plants in his neighbourhood with much ability and diligence. I saw the plant last September growing in great profusion in the Lurgan Canal, between Lisburn and Moira, where Mr. Stewart discovered it. Its principal habitats in the British Isles are the counties of Norfolk and Suffolk; but Mr. W. Wilson, the famous muscologist, pointed it out to me in September of last year growing near Warrington, in Lancashire. It is one of the plants which has hitherto been supposed not to have crossed the Irish Channel in its geographical range of distribution.

Dr. H. R. de Ricci, Upper Merrion-street, was elected an Ordinary Member of the Society.

The meeting then adjourned.

THURSDAY, JANUARY 3, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the Chair.

READ the Minutes of the previous meeting, which were signed.

The following paper was then read :—

NOTE ON THE “BLUE MIST.” By J. J. LALOR, F. R. G. S. I.

AGREEABLE to the request of the Council expressed at our last meeting, I take from my note-book the memoranda I made therein relative to the occurrence of the so-called “Blue Mist,” or “Fog,” supposed by many to accompany the “cholera plague.” Had I known at the time that the subject would have been thought worthy of recording in the “Proceedings” of our Society, I should have endeavoured to give you a fuller account thereof, and also endeavoured to note the total disappearance of it from my neighbourhood.

On Friday, the 28th September, shortly after 4 o'clock, walking from Foxrock-road towards Kill-o'-the-Grange, nearly due east, I first noticed this peculiar atmospheric phenomenon, resembling the vapour emitted from a greenwood fire, after all the dense smoke had passed away. It extended to the height of about twelve feet from the ground, oscillating in a gentle manner, similar to the elevation and depression of the sea after a storm, when the wind has completely lulled and the surface remains unbroken. The extent of this alternate change did not appear to exceed one foot. The second time I noticed it was on the following Sunday, from half-past 12 till past 3 o'clock, when the cloud-like vapour was distinctly visible, but more so when viewed southward and westward—denser towards the earth; but the same oscillation was distinctly visible on the top, and in no instance could I perceive the phenomena at a greater height than fourteen feet. On both occasions the day was fine, and on Sunday the sun shone brightly throughout the time I observed this peculiar appearance.

In conclusion, I may observe, that when trees were in the vicinity the effect was intensified, as they served as a screen, whereby the effect was concentrated.

It is possibly worthy of note, that the Saturday, Sunday, and Monday were the most fatal days of the epidemic in Kingstown and neighbourhood, the attacks being numerous and rapid in the various stages, and almost all proved fatal. Though the deaths on some days exceeded these, still the time of the duration of the attack was more lengthened in every other instance traceable by me. In confirmation, I beg to call attention to the pamphlet, just published, edited by Dr. Thomas More Madden, M. R. I. A., and by the late Charles Halliday, M. R. I. A.*

* “A Statistical Inquiry into the Sanitary Condition of Kingstown,” p. 7.

THE EPIDEMIC CHOLERA IN KINGSTOWN.—Notwithstanding its constant intercourse with Dublin, the epidemic cholera, which commenced in Dublin on the 27th July, did not reach Kingstown till the 18th of September, when the first case occurred in Upper George's-street; but from that time it raged with greater severity, in proportion to the population there, than it did in Dublin. During nine weeks from its appearance in Kingstown, 124 deaths were reported from that cause.

The following Table, showing the number of deaths from cholera and diarrhœa in Kingstown each week, from the commencement to the cessation of the epidemic there, is founded on the weekly reports of the Registrar-General:—

Deaths.	WEEK ENDING									
	September 15th, 22nd, 29th.			October 5th, 13th, 20th, 27th.				November 3rd, 10th, 17th.		
Cholera, . . .	10	1	7	19	15	27	24	13	10	8
Diarrhœa, . . .	2	1	1	0	3	0	0	3	3	0
Total from all causes, } }	7	7	15	30	23	42	33	24	21	12

These observations, being compiled from a totally independent source, I think them worthy to bring under the notice of the Society.

The following paper was read:—

REMARKS ON THE GENERA ZYGOGONIUM (DE BARY) AND ZYGOGONIUM (KÜTZ.), WITH DESCRIPTION OF THE CONJUGATED STATE OF THE PLANT BELIEVED TO BE IDENTICAL WITH ZYGOGONIUM LÆVE (KÜTZ.), BUT WHICH IS REFERABLE RATHER TO THE GENUS MOUGEOTIA (DE BARY, NON AGARDH). By WILLIAM ARCHER.

A MINUTE, simple, filamentous, green Alga—that is, a series of short cylindrical cells, of different lengths, combined in an unbranched linear series—might at first sight be regarded perhaps as hardly worthy of prolonged examination—an organism which boasts no gay coloration, no striking form, which probably occurs mingled with a multitude of others perhaps equally unattractive to a casual observer, might indeed seem to possess no very great points of interest to arrest attention, or to claim our study; nay, so lowly a plant as that which we have now to do with might seem as hardly even *sui generis*, as hardly possessing a proper individuality amongst the other, probably numerous, simple forms by which it may be surrounded. But the little filament, the occurrence of which in the conjugated state suggests the materials for the following remarks, simple as it is, I should hold can be readily recognised when recent, even in the barren state; and the characters then presented, combined with those of the conjugated condition, are sufficiently

marked, so far as I can see, to stamp its genus amongst the Conjugatæ with abundant accuracy.

On referring to Professor de Bary's most valuable work on the Conjugatæ, and to his figure of *Zyogonium didymum* (Rabh.),* one might be almost at first sight disposed to think that my plant (Pl. IV., Figs. 1, 2, 3), was congeneric, if not specifically identical therewith; but, if de Bary be correct in his appreciation of the characters of his plant—and he is always so accurate that it is difficult to suppose him to be in error in this instance—a more careful comparison will show that they are by no means congeneric.

It has always appeared to me a course to be avoided, and a system to be deprecated, that of authors employing an old generic name in a new or much modified sense. This procedure necessarily involves the name of the author in whose sense one wishes the name to be understood to be constantly appended, and, to make more certain, it would also seem to require the addition of "not of" (non)—the second author (by name). Even with this precaution, the fact of one name being simultaneously current in two senses appears to me to be calculated to lead not unfrequently to considerable ambiguity and misunderstanding.

From the fact, then, that *Zyogonium* (Kütz.) and *Zyogonium* (de Bary) are not by any means one and the same thing, it may be desirable here to explain Kützing's genus, and then the other related genus of de Bary; afterwards to describe the particular plant now drawn attention to, which I think is truly identical with that named *Zyogonium leve* by Kützing, and thereupon to point out its divergencies from either genus, notwithstanding its resemblance to de Bary's, and its seeming identity with Kützing's, plant; and finally to indicate what is, I think, no doubt its proper generic location.

Although de Bary in his quoted work employs the name *Zyogonium*, he does not do so, as has been mentioned, in Kützing's sense. The name *Zyogonium* is one of Kützing's; and his genus, so denominated, may most briefly be defined by saying that for the most part it comprehends those *Zygnemata* in which the zygospore is formed in the tube halfway between the two conjugating joints, the cell-contents presenting a doubly-stellate arrangement, but sometimes in a band, or scattered; whereas to the genus *Zygnema*, as understood by him, Kützing would consign those forms only in which the zygospore becomes formed within one of the parent conjugating joints, the cell-contents of the ordinary plants presenting the doubly-stellate arrangement. Thus *Zyogonium* (Kütz.) seems a somewhat heterogeneous assemblage, because it is made to contain forms with arrangement of contents like the *Zygnemata*, along with others in which another arrangement prevails. De Bary, without doubt, is quite right in placing all the forms with the doubly-stellate arrangement of the cell-contents of the joints, no matter whether the spore is formed within one of the parent conjugating joints or in the

* "Untersuchungen über die Familie der Conjugaten," t. viii., ff. 18, 19.

transverse tube, in one genus—Zygnema. I have said that Kützing seems to have intended his genus Zygonium to include those Zygnemata in which the zygospore is formed in the transverse tube; but, no doubt, he further includes some forms in that genus in which the conjugated state has not yet been seen. As to such it is manifestly premature to judge; therefore, upon what grounds he *assumes* their genus it is not easy to perceive, seeing that his essential generic distinction does not depend on the character presented by the barren state. But as regards those whose endochrome is not doubly-stellate, but in a single compressed mass or band, and whose conjugated state is also unknown, it is still less easy to see why he places them in the same genus. If, as I should think, in accordance with de Bary, we ought to do, we place all the forms with the doubly-stellate arrangement of the endochrome in the genus Zygnema, then such forms, at least (be they all truly distinct or not), as Kützing's *Zygonium conspicuum*, *Z. decussatum*, *Z. affine*, *Z. parvulum*, *Z. immersum*, *Z. æquale*, *Z. nivale*, *Z. lutescens*, *Z. anomalum*, and others, are to be considered as belonging to Zygnema. *Zygonium pleurospermum* (Kütz.) has been shown by de Bary to be truly a Mesocarpus (just as the false genus "Rhynconema" is strictly referrible to Spirogyra). There then seems to remain, perhaps, such forms as *Zygonium ericetorum* (Kütz.), *Z. torulosum* (Kütz.), and *Z. læve* (Kütz.), of the forms enumerated by Kützing, which cannot be referred to Zygnema, judging even from their barren state. And it is for such forms as these last mentioned, with quite another mode of conjugation, according to de Bary, that the latter would make a genus under the same name, having removed to the genus Zygnema, as before mentioned, the other forms referred by Kützing to his Zygonium.

Why Kützing should have placed a plant like his *Zygonium læve*, with its axile bands of endochrome quite unlike the forms with the arrangement of the contents as in Zygnema, in the genus Zygonium at all, the more especially as he was unaware seemingly of the conjugated state of this form, seems to me not readily to be perceived.

Now, having supposed all the forms possessing the arrangement of the endochrome in the unconjugated joints which I have characterized as "doubly-stellate," whether the zygospore be formed in the parent joints or in the transverse tube, as collectively included in the genus Zygnema, it is proper to allude to a common character which pervades the whole of the forms alluded to, and which belongs to them, in common with the other genera of the Zygnemæ (de Bary), as compared with the Mesocarpæ (de Bary). I allude to the zygospore being the result of the fusion of the entire cell-contents, "primordial utricles" and all, of the pair of conjugating joints, the spore not becoming shut off from the original common cavity formed by the fusion of the two united parent cells, thus not cutting off portions of their contents very poor in endochrome. This may be said to be but a negative character; but it well distinguishes these from the Mesocarpæ, in which latter this dividing-off of portions of the common cavity formed by the union of the pair of conjugated joints, and therewith likewise shutting off portions of their

original cell-contents, though these be poor in endochrome, the central cell containing the spore, takes place.

Such then being the characters of the genus *Zygnema* (Ag.)—viz., joints containing two axile, more or less distinctly stellate chlorophyll-bodies, each surrounding a starch granule, and connected by the central nucleus, or in a “resting” condition, becoming so densely filled with endochrome that the stellate appearance becomes lost, zygospores formed either in the connecting tube or in one of the parent cells, and this by the complete fusion of the whole of the cell-contents of the parent cells—such being, I say, the characters of the genus, there can be no question that, relying on the correctness of his description as regards the plant named *Zyggonium didyimum*, de Bary is quite right in making a new genus for the same. All that I venture to deprecate is his not coining a new name for it, in order to avoid ambiguity.

But, in order to compare our plant with de Bary’s, and this for the purpose of showing that they are not identical, it will be advisable here to give de Bary’s description of *his* *Zyggonium*, inasmuch as I believe it does not occur in any English book, and this is as follows:*

Cells cylindrical or barrel-shaped, with thick, often many-layered cell-wall, towards the middle at each side an irregular chlorophyll-corpusele, furnished with a starch granule; both often confluent into an axile string (in the very thick-walled cells, mostly covered with granules); union of the conjugating filaments ladder-formed; the processes of the two cells of the filament, which grow opposite one another, and take up the chlorophyll contents, become shut off as fructification cells, which then become fused together into a non-contracted zygospore.†

The type of this genus so defined is supposed to be the common *Z. ericetorum*; but, as it appears, according to de Bary, that the typical *Z. ericetorum* has not been found conjugated, his allusion to the process in the generic diagnosis is founded on dried examples, from Professor Rabenhorst’s collection, of a form named *Z. didyimum*, which he (Professor de Bary) considers, however, very closely to resemble the water-form of *Z. ericetorum*.

Now, my plant (Fig. 1) has short cells, varying in this regard from nearly quadrate to three or four times longer than broad, according to the interval of time elapsed since division; the contents bright herbaceous green, forming an axile compressed band, with a central therein

* “Untersuchungen,” &c., p. 79.

† I would here, as regards this latter character, remind those who may consult de Bary’s drawings (l. c.) of his *Zyggonium didyimum*, although his Fig. 18 does not show any granular contents as left behind in the cavities of the parent conjugated joints (as in Fig. 19), that he expressly mentions, in the explanation of the Plate, that in all the cells of these figures “a primordial utricle, with contents, was present, where left out in the drawings”—otherwise, indeed, they could not accord with the character and description given of his plant.

more or less immersed, pellucid orbicular nucleus with nucleolus (never separate stellate chlorophyll bodies, as in *Zygnema*); the conjugation takes place by short, wide processes (Figs. 2, 3), which circumstance, along with the shortness of the cells or joints, gives the pair of conjugating filaments somewhat the appearance of a perforated ribbon-like structure; the total mass of cell-contents of each pair of conjugating joints becomes combined with the other into an elliptic zygospore within the inflated transverse tube; the longer diameter of the zygospore is placed vertically to the length of the filaments; the middle space occupied thereby not becoming shut off from the cavities formed by the union of the parent joints (Figs. 2, 3).

That the total cell-contents, "primordial utricle" and all, wholly coalesce to form the zygospore, I have completely satisfied myself, both by there being no granular matter whatever left behind in the parent conjugating joints, and by no further contraction of any contents taking place on the application of reagents. In the same way it is equally evident that the zygospore is not cut off from the cavities of the parent-cells, but lies freely in the inflated transverse tube, though frequently in contact with its walls about the middle.

A seemingly fair figure of this type is given by Rabenhorst;* but the plant is referred by that author to *Zygogonium* in the Kützingian sense, and de Bary's characters are not taken into consideration. Little information can be drawn from the figure referred to as regards the arrangement of the endochrome in the unconjugated joint; but it does not seem either doubly-stellate or forming a compressed band, but scattered. If the former, it would be a *Zygnema*, with the zygospore in the middle. It might possibly be assumed, indeed, that the figure may represent the broad or flat view of the band of endochrome as towards the observer. Therefore Rabenhorst's figure would be still more likely to represent a plant congeneric with the present, seeing that here the whole cell-contents are represented as fused into the spore, no part of the whole united mass of contents being shut off from the spore itself, but the cavity being empty, with the exception, of course, of the centre of the transverse tube occupied by the spore; but I hardly think his plant specifically alike, owing to the endochrome therein not forming a compressed axile band.

Now, the foregoing characters of the plant, here drawn attention to, as has been described, would seem at once so decisive, that it should be referred to *Mougeotia* (de Bary, non Agardh), and not to *Zygogonium* in either sense, that it might almost be asked why there should be any question on the subject, or any allusion to the genus *Zygogonium* (de Bary), or *Zygogonium* (Kütz.), as connected with it. The reason for this I shall presently advert to.

Having thus reached the genus to which I am disposed to believe our plant truly belongs, it is perhaps well that I should here try to

* "Kryptogamen-Flora von Sachsen," &c., p. 162.

define it, especially as the genus *Mougeotia* (de Bary) is not at all the same thing as *Mougeotia* (Ag.), being in fact another instance of what I regard, as I before mentioned, as a thing to be regretted—that of the revival of an old name in a new sense.

The type of the genus *Mougeotia* (Ag.) is the ordinary *M. genuflexa* (Ag. et Auct.), remarkable for the curious manner in which the filaments come into contact, and become mutually attached at the obtuse angles formed by the knee-like bending of the joints, the true conjugation, however, taking place, as shown by de Bary, by the union of the contents of a joint with those of a neighbouring joint of the same filament by means of an arch- or bridge-like communication formed between them, a portion of the so-united contents, poor in endochrome, being shut off in each parent-cell, the central portion contained in the arch-like connexion becoming the spore. This is, the latter circumstance excepted, similar to the mode which takes place in the false genus *Rhynconema*, as compared with that of *Spirogyra*. From the circumstance alluded to, and inasmuch likewise as the contents of the ordinary joints form a compressed band, like that of *Mesocarpus*, de Bary is surely correct in referring *Mougeotia genuflexa* (Ag. et Auct.) to that genus, which he does under the name *Mesocarpus pleurocarpus*. (Why not, however, under the name *Mesocarpus genuflexus*?)

Now, the type of de Bary's new genus *Mougeotia*—for new genus it must be regarded, though called by an old name—is the plant named by him *Mougeotia glyptosperma*. This is a very beautiful and very marked plant, found in spring, rather abundantly conjugated, in certain heath pools. This plant, as de Bary well points out, could not be placed alongside of *Mesocarpus pleurocarpus*, ejus (= *Mougeotia genuflexa* Auct.), nor could it be referred to *Mesocarpus* (Hass.) at all, (though it may possibly have been previously recorded under the name *Mesocarpus intricatus*). It is no doubt related on the one hand to the latter genus: like it, the endochrome forms a compressed longitudinal band; and like it, too (so far as the circumstance is of value), the zygospore is formed halfway between the two conjugating joints; but it is distinguished strongly by the fact that here the whole cell-contents, "primordial utricle" and all, of the two conjugating joints completely coalesce, leaving the cavity of the parent joints empty, in order to form the zygospore; whilst in *Mesocarpus* the contact of the "primordial utricles" of the two conjugating joints is not followed by a fusion of the whole united mass into the zygospore, but this latter is formed by a concentration of the principal part of the green and solid contents in the connecting canal halfway between the two conjugating joints and the shutting off thereupon of the residue of the pale granular contents remaining in each parent joint, which latter becomes eventually effete and lost. Hence in the genus *Mougeotia* (de Bary, non Ag.) the spore is the actual result of the complete fusion of the entire of the cell-contents of the two conjugating joints—it is the true zygospore, whilst in *Mesocarpus* the spore is a further ultimate development or daughter-cell formed from a portion only of the primary zygospore. Therefore, on

the other hand, this plant shows an affinity to *Zygnema*, *Spirogyra*, and *Sirogonium*; but it is, of course, completely distinct in its compressed band of endochrome, not doubly-stellate, as in the former genus, and not forming a parietal spiral band, as in the two latter genera. The complete emptying out of the conjugating cells in *Mougeotia glyptosperma* (de Bary) imparts a peculiar smooth, almost shining aspect to the filaments, which, coupled with the peculiar grooved and ridged spores, gives a mass in the conjugated state a remarkably pretty appearance. Excellent figures of this plant are given by de Bary.*

In my plant, then, the endochrome forms an axile band, and its zygospore is formed by the total fusion of the entire cell-contents of two conjugating joints into the zygospore within the transverse tube, and without any portion of the contents being shut off from the spore in the cavities of the parent joints. This plant is not a *Mesocarpus*, being quite excluded from that genus for the last reason mentioned. It is in truth a *Mougeotia*, in the de Baryan, but *not* the Agardhian sense. It is to be distinguished from *Mougeotia glyptosperma* (de Bary) by its much shorter and wider cells, much wider transverse tubes, by its cells not becoming kneed or curved during conjugation; but pending conjugation presenting (as before mentioned) the appearance of a perforated ribbon-like structure, not a wide-looped network; and, above all, by its zygospore being simply elliptic, and destitute of the grooves and ribs, and the somewhat acute keel, which form so distinguishing features of that of *M. glyptosperma*.

But a further reason for bringing *Zygonium* (de Bary) into the question in connexion with this plant, besides its no doubt considerable general resemblance thereto, is that at certain stages of the process of conjugation the present plant presents appearances so like de Bary's figure,† but perhaps still more like Rabenhorst's, as to lead to the view, as before mentioned, that it and they may be congeneric, notwithstanding that de Bary made a separate genus of his plant.

This circumstance alluded to is a standstill, as it were, sometimes noticeable, of the globular mass of the contents of each parent joint, just within the connecting tube, where they became definitively bounded, to appearance, as if distinct individualized cells, ultimately, however, coalescing to form the zygospore (Fig. 3).

Now, the question arises—May de Bary's figures (it will be noted made from dried specimens) have been possibly taken from examples arrested at this stage of advancement of the process of conjugation, and, from the same cause—that is, dried and deteriorated specimens—may he not have supposed these bodies, thus partially advanced towards conjugation, to be portions only, not the total cell-contents, wholly retracted from the cell-wall? May some external granules have lent to the specimens an appearance of certain granular contents left behind within

* *Op. cit.*, t. viii., figg. 20, 21, 22, 23, 24, 25.

† *Op. cit.*, t. viii., f. 18, a, b.

the parent conjugating cells; and, as regards the two bodies, not yet coalesced, represented by him as specially coated by a cell-wall, and separated by a septum from the parent-cells, may they not have been (like the condition in my Fig. 3, lower part) simply the contracted total cell-contents, without any special coat, arrested or caught at the point just before mutual fusion?

But, great as is the resemblance of the plant figured by de Bary, when we reflect on the beauty and accuracy of his observations in general, it is indeed with difficulty that we can bring ourselves to believe in his having misconceived the character of the plant he describes, and calls *Zygogonium didymum*; and if there be really, after all, no such misconception, then my plant cannot be *Zygogonium ericetorum*, nor any variety, nor can it indeed fall under the genus *Zygogonium* at all, either as *Zygogonium* (de Bary), or *Zygogonium* (Kütz.); for, as already mentioned, as will be seen from the characters above detailed, it must find its place truly in *Mougeotia* (de Bary, non Agardh). If, on the other hand, de Bary have really erred as regards his plant, the genus *Zygogonium*, as constituted by him, may possibly not stand, or at least it may have to remain contingent on its being necessary to retain it for the common plant *Zygogonium ericetorum* (Kütz.); for it should not certainly be maintained for those species of *Zygnema* only which form their zygospores within the transverse tube.

In endeavouring to identify this plant with any form already described, I venture to think that it comes quite close enough to *Zygogonium læve* (Kütz.) to render it probable that they are indeed one and the same thing, though Kützing describes only the barren plant. And if this view be correct, adopting the genus *Mougeotia* (de Bary, non Agardh), this species should be henceforth called *Mougeotia lævis*.

I have to apologize for the present somewhat roundabout description of this plant. It is not easy to convey at once a definite idea of the points dwelt upon, but I trust my meaning may be sufficiently apparent to observers who have made themselves acquainted with the peculiarities and the characters of these interesting Algæ. Those who have become familiarized with these forms will, I think, well know that these distinctions are by no means imaginary, and will accord with me in feeling that they each possess an individuality, and that without much difficulty we can know and recognise the same thing, time after time, when it offers itself to observation; and that feeling seems to be increased and strengthened when, as in the present instance, we are able to follow up the characters of a perhaps tolerably familiar form to its fructification, compare it in its various stages with its allies, and, though they are sometimes hard to describe, note its differences and its idiosyncrasies.

George Andrews, Esq., Williamstown Castle, and Dr. David Basil Hewitt, 35, York-street, were elected Ordinary Members of the Society.

The meeting then adjourned.

THURSDAY, FEBRUARY 7, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the Chair.

The Minutes of the previous meeting were read, and signed.

A paper was then read, entitled

ZOOLOGICAL NOTES. By W. ANDREWS, M. R. I. A., V. P.

I HAVE always felt an interest in exploring the tide-marks of lines of coast or shores that have been but imperfectly investigated; for often after gales of wind will be found among rejectamenta, relics of facts of importance to knowledge, and of forms new to zoological science that inhabit the deeper soundings off the coast brought to note.

My intention this evening was to have submitted some records of interest with regard to two specimens of Tetraodon, obtained in that part of the Bay of Brandon, coast of Kerry, that stretches towards the point of the Magherees, on the shores of which, during violent north-west gales, the heavy seas of the Atlantic roll, sending in numerous specimens of zoology to notice, some exhibiting rare forms of the warmer shores of the coast of Portugal and the Mediterranean, and others which are characteristic of a northern zone.

I place but little importance upon the often-supposed influence of the Gulf-stream, and of the peculiar features of the soundings of the Nymph Bank, which sweeps around the south-west coast of Ireland, extending to some distance to deep Atlantic soundings; or of those currents whose warm influence is presumed to give a Lusitanian character to the zoology and to the botany of the south and western parts of our island. We have instances of a mixed character of the Fauna and Flora, but they give no indications of any decided feature of importance. No doubt, our western and southern shores are much influenced by insular position, and by the expanse of the Atlantic Ocean, that from prevailing winds cause a mild and moist climatic effect. The saxifrages of the Pyrenees, *Arenaria ciliata*, *Erica Mediterranea*, *E. Hibernica*, and other forms, show a Lusitanian character like that of Portugal, while numerous species of marine zoology are representatives of the shores of that country and of the Mediterranean. The Red-band fish—*Cepola rubescens*, *Mullus Surmuletus*, *Polyprion Cernium*, common to the Mediterranean, are recorded as rare on our shores, because only rarely taken; but I believe them not to be so, if proper means of capture were practised. The flying fish (*Exocetus evolvans*) has been found in Galway Bay, and numbers of living specimens were seen in Dingle Bay. In fact, numerous Mediterranean species could be recorded, and other forms of marine zoology, still unnoticed, for want of means of opportunity of searching investigation. Northern forms are equally numerous, such as the Greenland Bullhead, *Cottus Grælandicus*, *Sebastes Norvegicus*, and the species of the Syngnathus (*Siphonostomom Typhle*), is most abundant

on our south-west shores, a species peculiarly existing in northern latitudes where the *Syngnathus acus* is rare or not known.

The species of Tetraodon that I had proposed to submit this evening was cast ashore in Brandon Bay, and as it appeared to be a form hitherto unknown to the British shores, I thought it prudent to defer any particular notice until, aided by my friend Dr. Carte, the able Director of the Museum of the Royal Dublin Society, I could obtain through him reference to those works in which the several known species of that genus are recorded and described.

The Tetraodons belong to that section of the family Gymnodontes, that have the jaws furnished with an ivory-like substance, presenting the appearance of true teeth. Thus the Tetraodons have the jaws divided by a suture in the middle, as to give the appearance of four teeth. The Diodon has the jaws divided, while those of the Triodon have only the upper jaw divided. These are chiefly ground-feeding fish, their strong jaws enabling them to feed on crustacea and molluscous animals; thence they are but seldom captured, except when accidentally cast ashore.

Cast ashore, in the same bay, was obtained a rare species of Delphinorhynchus, the second specimen only obtained in the British seas, and the second male specimen known to the European Fauna. Of this a record will hereafter be given.

In looking through the recent works of British Ichthyologists many of our rare species of fish seem to have passed unnoticed—those works professing to be the records of Great Britain and of Ireland. As I have been alluding to the Diodontidæ, one of the most remarkable belonging to that order is the oblong sun-fish (*Orthagoriscus oblongus*), of which no record has been given of its existence on the coasts of Ireland. This brilliantly marked fish was taken in a living state off Tramore Bay, county of Waterford, early in the month of October, 1846, when the beautiful and accurate drawing, which I now exhibit, was made while its vivid markings and colourings were in the freshest state, an opportunity which no authentic specimen seems to have afforded. Some difficulties occurred as to the right of possession, and, therefore, the means of a satisfactory examination of its internal organization were not given until decomposition was too far advanced. The fish was finally obtained by the late Dr. Farren, and presented to the Society. So far as I was at the time enabled I made notes of its structure, its measurements, and characteristics that confirm its specific distinctions. These, however, I will not intrude upon the meeting, but retain them for insertion in our "Proceedings," as no notice has as yet appeared in any journal of its record.

A very able paper was given on the *Orthagoriscus mola*, the short sun-fish, by the late Dr. Bellingham, and published in the "Magazine of Natural History" for 1840, at page 235. The specimen is in the Museum of this Society. The *O. oblongus* not only differs much from *O. mola*, or short sun-fish, by the beauty of its colours and markings, but by the oblong form of the body, the pointed pectoral fins, the skin

perfectly smooth, and divided into irregularly formed hexagonal compartments, the sutures of which fit smoothly into each other, the caudal fin truncate or square, not rounded, and the true caudal fin being immediately connected with the dorsal and anal fins. It has no natatory bladder. In one of my rambles with Colonel the Hon. D. B. de Moleyns, who is a keen and ardent observer of natural history objects, we for some time noticed from the cliffs of Brandon Head the singular action of a fine specimen of the short sun-fish. The fish, which was of large size, appeared altogether of a whitish or silvery colour, and continued for a considerable time on the surface of the water, sometimes floating with its side uppermost, displaying its large dorsal and anal fins, at other times with its dorsal fin high out of the water. We had much delay in getting a canoe, and when we rounded the headland the heaviness of the sea prevented our getting a glimpse of the fish. The short sun-fish is not unfrequent on that part of the coast, and is known by the native name of Lappeen, or Lappadan.

Another rare fish, which scarcely appears fully recorded, although noticed in the "Zoologist" as Pennant's Globe-fish (*Tetraodon Pennantii*), was taken on the coast of Wexford in 1850. The fish was taken at Curracloe in September, 1850. The original sketch, with the description, was sent to me; it measured 2 feet 2 inches in length, and the girth of the air-sac was 26 inches.

In conclusion, I must allude to a singular species of *Diodon*, which was washed on board the brig "Ganges," of Boston, in the Atlantic. It is the smallest of the genus, and is described and figured in the "Annals of the Lyceum of Natural History of New York," 1828, as *Diodon carinatus*.

Dr. E. Perceval Wright, F. L. S., said that the Natural History Society ought to be glad to receive notices of every well-authenticated addition to the Irish Fauna, and it would be important to have the record of any species of *Tetraodon* on our shores, even should it be *T. Pennantii*. As to the *Orthogoriscus oblongus*, he would like very much to see the coloured drawing exhibited by Mr. Andrews appear in the "Proceedings" of the Society. He had seen drawings of the species such as those in Yarrell, which he believed to be correct in outline; but coloured drawings from the living specimen were of great importance. At the time Mr. Andrews first exhibited this species, the Society did not publish their "Proceedings" in any permanent form, and the record of its occurrence would have been lost but for Mr. Thompson's work. He trusted this would show the importance of having all the papers read before the Society speedily published in its Journal, where they would just as surely be noticed and recorded as if they were printed in the Journals of the Berlin or Vienna Academies. He had heard a rumour that the Council were rather opposed to spending the Society's money on printing and illustrating papers. If this were true, then, as Mr. Andrews himself remarked, they would not get papers of any value. For his part, he would rather the Society were to die in producing one

good large volume of "Proceedings" than that it should live on, daily decaying through inanition caused by the want of scientific food. In order that he might call the attention of the Council to the great importance of publishing, and to the wishes of the Society itself on this subject, he would, with the permission of the President, and he hoped with the sanction of all the Members present, move the following Resolution:—

"That Mr. Andrews's paper 'On the Occurrence of some rare Fish on the Irish Coast' be referred to the Council, with a request that it may be published *in extenso*, and illustrated in the Journal of the Society."

Mr. Dixon seconded this resolution, which, being put from the chair, was declared by the President to have passed unanimously.

The meeting adjourned to the first Thursday in March.

THURSDAY, MARCH 7, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the Chair.

The previous Minutes having been duly confirmed, the following paper, in the author's absence, was read by Dr. E. Perceval Wright:—

ON BOTHRIOCEPHALUS LATUS, OR BROAD TAPEWORM—ITS OCCURRENCE IN IRELAND; WITH REMARKS ON ITS CLAIM FOR ADMISSION INTO THE LIST OF OUR INDIGENOUS FAUNA. By DR. WILLIAM FRAZER, M. R. I. A., &c.; Hon. Member Montreal Medico-Chirurgical Society.

TAPEWORMS are of rather rare occurrence in Ireland, though both *Tenia solium* and *T. mediocanellata* are met with, the latter being comparatively seldom seen—or perhaps it would be more correct to say, seldom recognised; for the first instance in which it was detected was recorded by myself in "The Medical Press and Circular" a few months since. I have reason to believe, however, that it has heretofore been confounded with the *T. solium*, and is far more common than generally supposed throughout the country. There can be no question that the broad Tapeworm, or Bothriocephalus, is by far the rarest of this class of Entozoa; for the fourth recorded case of its having been discovered in Ireland was described by me in the pages of the "Press" for April 10, 1867. The present case is, therefore, the fifth instance where it has fallen under medical observation; and it possesses peculiar interest, from the fact that, whilst in almost every patient infested by this animal there were grounds for ascribing the vermination to some foreign and Continental source, the patient from whom the present example was obtained had never travelled beyond the limits of Great Britain and Ireland. So far as can be ascertained, all the Bothriocephali yet expelled were referable to *B. latus*: the species *B. cordatus*—common

in dogs in North Greenland, and occasionally finding entrance into the bodies of their masters in that bleak territory—has not been found in Ireland, at least in the human body.

The geographical range of distribution of *B. latus* is ascertained with tolerable accuracy in Northern Europe; its southern limits are less thoroughly known. It prevails extensively in the departments of Switzerland, and spreads from the South of France through Central Germany and Poland, at least to the Eastern borders of European Russia. A gentleman informs me he has observed it at Kazan, where it is often met with, though less prevalent there than the true *Tænia*. Northwards its habitat extends through the Baltic provinces and Holland; and Dr. Huss, of Sweden, describes it as extensively prevalent on part of the Lapland frontier, in Finland, and on the shores of the Gulf of Bothnia. In the South of Europe it has been recognised in certain of the Italian cities; and there are reasons to believe it reaches even to Northern Africa, Algeria, and Abyssinia. It is also quite possible it may yet be discovered spreading far eastwards, through the regions of Central and Northern Asia; for Küchenmeister more than suggests it was imported into Europe from these lands, following the direction of Tartar and Mongol migrations from their primitive Asiatic settlements: still he admits the important qualifying fact, that in all those localities where it has become naturalized its favourite haunts are damp, low situations—extensive marshy districts, reaching along “the shores of rivers and lakes, and of the sea, and especially in parts exposed to inundations.” The observations of Dr. Huss lead to similar conclusions: he says—“On the coasts there is scarcely a family altogether free from its presence; old and young, rich and poor, natives and emigrants, alike suffer from the worm.” On passing inwards the liability to become infested decreases; and eight or ten leagues from the coast, rivers, or lakes, it almost ceases to be found. These statements regarding the favoured situations where *Bothriocephali* flourish, being marshy soil, near lakes or sheets of water, are confirmed by the history of the case I wish to record.

In collating the antecedent history of individuals from whom *Bothriocephali* were expelled, either here or in England, it will be noticed there is one striking feature almost invariably present—namely, they have either visited or resided in some Continental locality where this worm is known to abound; and the presumption almost becomes a certainty that they must have obtained their parasites during their sojourn abroad. The exceptions to this rule are of extreme rarity. Thus, of the six specimens that are preserved in the Museum of the London College of Surgeons, one was got from a native of Switzerland; another, from a Russian, attached to the Russian Embassy, London; a third, from a person who had travelled in Switzerland; the fourth came from a native of Russia, who, after long residing in England, revisited his native land, and on his return brought back with him his parasite; the fifth happened in the practice of Dr. Gull; it was expelled from a little girl who resided at Woolwich, and is the only case of the series where the worm can be

considered of indigenous origin : the history of the sixth case is unrecorded. The example which fell under my own observation, in April last, was obtained from a gentleman long resident in Dublin ; originally a native of Russian Poland, he may have acquired his parasite when resident in the marshy districts of that land, or have become its host whilst travelling afterwards through Central Germany and the Baltic provinces, previous to settling here. Strange to state, until the joints were expelled which he brought me, he never entertained the slightest suspicion of harbouring worms. There is a valuable paper of Dr. Cobbold's published in the "Journal of the Linnæan Society" for November, 1867, which treats of the Entozoa that infest the dog. When describing the Bothriocephali, he states the difficulty that exists in determining the exact number of species that animal may harbour. Still it is admitted that *B. latus* does occur both in man and in the dog : as proof of this fact, "one such cestoid may be seen in the Museum of the Royal Veterinary College, and no doubt can be entertained that it belongs to this species." Unfortunately, there is no clue given of the previous history of the animal : probably, like most human beings, it got the worm as a result of visiting the Continent. To complete the subject of the geographical distribution of this Entozoon, it should be stated that it is unknown across the Atlantic, save when imported into America from Europe. Thus Weinland asserts: "We have seen two specimens of the worm in this country [America]: the first was expelled from a Swiss, soon after his arrival ; the second was from an Englishman, in Richmond, Virginia, who had perhaps travelled in Switzerland, and, like the German anatomist and physiologist, Sæmmering, and many other travellers, brought away with him this *vade-mecum* from the land of William Tell. We have not yet seen a specimen which came from an American ; nor has Professor Leidy, of Philadelphia, as he informs us by letter."*

The life history and mode of propagation of this Entozoon, before it finds entrance into the human being, will require additional research to elucidate its mysteries. Too many of the statements on this subject are repetitions of clever guesswork and surmises. Dr. Knoch, of St. Petersburg, believed he had succeeded in rearing this worm in dogs by the direct experiment of feeding them with its embryos ; but more careful experiments by Leuckart establish clearly the necessity of some "intermediary bearer," as is now well known to happen with our ordinary Tapeworms.† Carl Vogt considered it was propagated by using sewage waters that contained its ova. This is less probable than the theory widely circulated, and having many corroborative facts to allege in its support—namely, that it has been transmitted through the agency of fish used for human food. Dr. Huss, who adopts this opinion, would ascribe it to the use of salmon : so far as Ireland is con-

* "Essay on the Tapeworms of Man," p. 59.

† See Dr. Cobbold's paper in the "Journal of the Linnæan Society."

cerned, either this cannot be true, or else our salmon enjoy a special and enviable exemption from a parasitic pest that must be very prevalent in other countries. Again, Küchenmeister has supported the view that its scolex passes its existence in some low marshy or aquatic animal, and finds admission within our bodies suspended in the water, or adhering to raw vegetables. This is far from improbable, considering the present state of our knowledge of its wide distribution over numerous countries where marshes abound.

The patient from whom the present specimen was procured resided in a healthy district in Ireland, far removed from the sea shore, though close to an extensive lake, in one of our Northern counties. The symptoms complained of were debility and impaired digestion; and, though no reason was assigned for the supposition, a conviction was expressed that the damaged state of health depended on "worms." As I thought it possible ascarides might be present, a full dose of santonine was exhibited. This produced its well-known influence on vision—imparting to surrounding objects a green or yellow tint for a few days—but it failed to expel any worms. The negative result of administering santonine shows that it exercises no power over *Bothriocephalus*, however potent and reliable it is for destroying *Ascaris lumbricoides*. Two or three weeks after, a few detached fragments of Tapeworm, consisting of adhering joints, were forwarded to me, immersed in spirit. These were so shrivelled and altered in appearance, that it was impossible to do more than ascertain their cestoid character, and also that they were quite unlike our ordinary Tapeworms. The patient, at my request, removed to town for treatment; a brisk aperient was directed, and soft diet continued for twenty-four hours; after which a full dose of oil of male fern was taken, made into emulsion with yolk of egg, and flavoured by a few drops of essence of peppermint. In the course of three hours the worm was expelled, dead, and quite perfect. I obtained the head of the animal, with fourteen feet of adhering joints. It is needless to say that the recovery was satisfactory.

The host in this case was born in Ireland, and has always resided here, with a brief interval, about four years since, when at school for six months at a small town in Lincolnshire. It was impossible to ascertain when the worm took up its residence, and the history throws no light on the origin of the parasite. Küchenmeister's observation of its preference for lake or marshy districts is supported by the patient's home being near a large lake of fresh water; and the temporary abode in Lincolnshire was on the borders of a county notorious for its fenny districts. Whether the patient obtained the animal in Ireland, or whilst at school in England, this undoubted example of "Russian"—or, as it is often termed, "Swiss"—Tapeworm, deserves to be considered of indigenous origin, and therefore "British." Ireland prides itself on being free from Ophidian reptiles: there is less truth in the oft-repeated statement that we have no toads; for a flourishing colony of true natterjacks reside in a district in Kerry, and I had rather record their extension over half the island in moderate quantity, than establish our claim

to the *Bothriocephalus latus*. It is fortunate that the patient's history admits of a degree of ambiguity; and, should any zealous naturalist desire to monopolize the parentage of the Entozoon for the other side of the Channel, I will offer no objection; admitting they possess at least one other example of its attacking the human being, and another less decisive of its occurring in the lower animals, to support their demand. I fear, however, the evidence afforded by the present case is too conclusive to permit our refusing it admission into the lists of the British Fauna, though with a strong hope that it may continue conspicuous amongst our native Entozoa by its exceptional rarity.

E. M. Hodgson, Esq., 19, Garville-avenue, Rathgar, was elected an Ordinary Member of the Society.

The Meeting then adjourned.

THURSDAY, APRIL 4, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the chair.

The minutes of the preceding meeting were read and confirmed.

A paper was then read, entitled

NOTES ON SOME LARVA CASES FROM AUSTRALIA. By ALEXANDER MACALISTER, M. D., L. R. C. S. I., Demonstrator of Anatomy, Royal College of Surgeons, Ireland.

I HAVE recently obtained several rather rare specimens of insect architecture from Australia, some from Gipps Land, and some from Angaston, in South Australia; the former were sent to me by Hugh Macalister, Esq., late of Ormeo, the latter by Dr. Samuel Carey, of Adelaide. I have found some little difficulty in identifying these habitations, but have succeeded in almost every instance, with some assistance from Professor Westwood, of Oxford, who kindly helped me to a determination in a doubtful case. I have scarcely any remains of the builders themselves, but as in most of the cases they have been seen and described, this is not so very important; and, therefore, in the subjoined remarks I will confine myself entirely to the description of the dwellings, referring to Professor Westwood's paper* for further information regarding the animals.

These, with one exception, are the constructions of creatures of the genus *Oiketicus*, established by the Rev. Landsdown Guilding for the reception of two West Indian Insects, which he has named *O. Kirbyi*, and *O. Macleayi*. To this genus Westwood refers one British insect, *O. nigricans*, formerly described by Curtis, as belonging to the genus

* "Proceedings of the Zoological Society of London," 1854.

Pentophera. The limits of the genus have been extended by the discovery of numerous Australian, Ceylon, and East Indian species, but it has been broken up by some authors into several different smaller genera, very unnecessarily, however, it seems to me. These extraordinary insects present some remarkable peculiarities in their life history, as observed by Saunders, Guilding, and Westwood, and in their affinities they rank beside the Psychidæ, or "Sackträger" of the Germans. These constitute a sub-division of the Heterocerous Lepidoptera.

The first and best known individual of the series is the case of *Oiketiscus Saundersii* (*O. elongatus*, Saunders),* and my specimen is probably the habitation of the female insect, whose dwelling is always longer and wider than that of the male. My specimen measures about seven inches in length, is somewhat ovato-lanceolate in shape, wider towards the upper or oral end, and being about two inches and a-half in circumference at its widest part, tapering to a soft flocculent open extremity at its distal end. The oral extremity is open, soft, and leathery, tearing with considerable difficulty. The exterior is of a dark grey colour, but the interior is of a light yellowish brown, very much resembling the hue of chamois leather. On the exterior there are to be seen a large number of small portions of twigs one inch in length, and all about the same degree of thickness. These are arranged in a double spiral row, one alternating with the other in such a manner as to give to these twigs on each side a quincuncial appearance. They are sunk one-third of their thickness into the wall of the structure, to which they are firmly adherent, and separable with very great difficulty, the connection being maintained by the adhesion of the woolly threads of the nest wall to all the irregularities on the extremities and cortical layer of the sticks. These surface twigs are not, except in rare cases, in contact with each other, and they are all arranged parallel to the long axis of the nest. Those immediately surrounding the inferior end are only attached to the nest by one extremity, and hang loosely around the soft distal extremity, being free for about three-fourths of their extent. The material of the nest wall is tough, and cuts like felt, which in reality it is. On the inner surface it very closely resembles chamois leather or very fine flannel in appearance, and no traces of the external twigs are visible on this aspect. Externally it was covered with a soft brownish or greyish nap or fur, which, however, is worn off in many parts, and this rests on the grey, firmer basis of felt. Microscopically this nest consists of delicate interlacing somewhat compressed or flattened threads, not branching, but felted together to form a dense stratum, and in this respect the tissue is similar on both surfaces of the wall. These threads are an animal nitrogenised secretion; they evolve an odour when burning like the smell of burnt bones, and agree in chemical nature with silk. Scattered on the outer walls are a number of rigid black or brownish hairs, also probably animal in their nature. The

* "Trans., Entom. Soc.," 1847, vol. v., p. 43.

twigs are of some exogenous plant—probably an acacia. The extremities of these appendages are rounded, and have evidently been so shaped by the strong jaws of the larva. The felted fibres of the wall occasionally cross over them, and thus form collars to bind them in their place. The adhesion of these sticks to the wall is so firm that they can be detached only by great force, and Mrs. Meredith in her “Notes and Sketches of New South Wales” says that in attempting to tear the wall the twigs will often tear across along with their silky envelope. Mr. Stephenson, whose observations are quoted by Professor Westwood, describes these cases as being hung upon the branches of *Lystospermum* or *Melaleuca*; and Mrs. Meredith notes that the insect seems to select those trees whose branches are nearly the colour of its own nest. It is described as being very swift in the reparation of any injury to the structure of its house; a breach is healed up with such expedition and accuracy that the nicest eye could not detect the patching. For figures and description of this species I would refer to Professor Westwood’s paper.*

The second individual is the case of *Oiketicus Lewinii*—probably that of the male figured by Westwood.† These houses will be seen to be solid, firmly built, nearly cylindrical in shape, and varying from an inch and a-quarter to an inch and a-half in length, and from an inch to an inch and a-quarter in circumference. The extremity is nearly flat at the oral end and obtusely conical or acuminate at the distal; externally they appear as cylindrical bundles of twigs; the interspaces between the component rods are so narrow that very little of the proper wall tissue is visible outside. About fifteen to seventeen twigs surround each case, and these are portions of various trees, apparently selected at random, as two or three different species of plants may be found contributing to form the wall of one case. The most of these twigs are half a line to a line in thickness, and about an inch to an inch and a-half in length; but in each case there will be one or two nearly double the length of the others, and projecting towards the distal end. Sometimes a few project on the oral end for a short distance, but the greater prolongations are invariably in the other direction. These twigs have all distinctly rounded or gnawed ends, and they are united by a felted matting similar to that in *O. Saundersii*. A thin lamina of this silky material is continued between each of the mural twigs, and comes to the external surface when it can be seen distinctly. The interior is lined by a firm, fine smooth silky stratum, closely bound to the interior of the twigs, and containing a loose flocculent down; and in one which I have opened there still remained the fragments of an annulated puparium. One specimen was firmly tied by a very stout root of strong twisted silky fibres to the bark of a plant, which I think was an Eu-

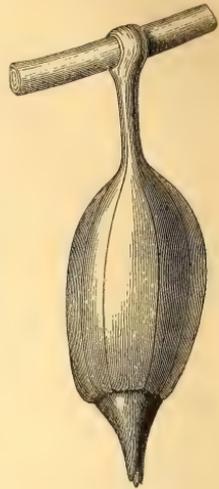
* “Proc. Zool. Soc.,” 1854, p. 223, Pl. 35, and to Mr. Sanders’s “Proc. Entomol. Soc.” vol. v., p. 43.

† “Proc. Zool. Soc.,” 1854, p. 37, and described at p. 231 of the same work.

calyptus, and a cluster of little red resinous drops were entangled in this adhesion.

The third, and, perhaps, most interesting, structure is the dwelling of *O. Herrichii* (Fig. 1), figured by Westwood,* but the plate is not quite in accordance with the present specimen. This case consists of three parts—a pedicle, body, and peristome. In general shape it resembles the capsule of a gigantic moss, with which, indeed, it was at first confounded. The pedicle by which it was suspended is a longitudinally furrowed cord, a little over four lines in length, widening to its distal extremity, and narrow at its basal end, which is firmly and structurally united with the base of the body. Its distal end exhibits a most beautiful and perfect elliptical loop, a line in length, resembling the eye of a large needle, and made of a flat band of interlaced fibres arching over from one lip of the end of the pedicle to the other. The component threads in it are firmer than those of the rest of the soft flexible pedicle, and its use was to support the case. When found it was thrown around a small branch, and thus the case was suspended. This portion of the habitation is extremely unlike the plate given by Mr. Westwood, in which the attachment is represented by a short thick lock of some irregular fibres. The body of the dwelling is ovate in outline, greyish white in colour, not ornamented with twigs, like the other species, and about 10 lines to $1\frac{1}{4}$ th inch in length. Its surface is marked by seven prominent ridges, which, by their projection, give its transversely sectional view the appearance of a heptagon with concave sides. These ribs or keels commence in the ridges of the pedicle, but extend for about a line or two on the base of the body as soft, prominent lines; then suddenly becoming stiff and rigid, they extend as the arcs of large circles as far as the oral extremity, there suddenly stopping. They are of the same composition as the rest of the nest wall, but harder and firmer, without any basis of foreign matter. Under the microscope this wall can be resolved into a dense coriaceous felted stratum of fibres, closely resembling those of the former species. The proximal extremity of the body is projected into a slight collar that overlays the base of the oral end or peristome, which is conical in shape, narrowing to a soft point. This wall exhibits from ten to fifteen acute, wavy plications, and ends in a soft fimbriated margin, with four or five teeth surrounding the door of the dwelling. The interior is lined by an extremely delicate but copious downy mass, and into its cavity there is but one passage. The specimen

Fig. 1.



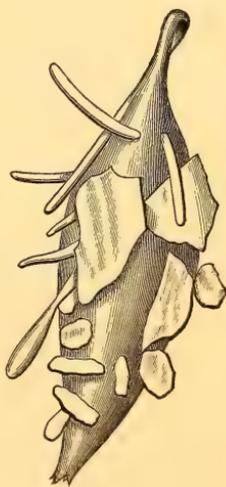
* *Loc. cit.*, Pl. 37, Fig. 3.

differs from that figured by Mr. Westwood, as before mentioned, in the structure of its stalk, and, secondly, in its not being so prominently keeled on its surface.

The fourth species I have identified with the case of *O. Hubneri*, figured by Westwood.* This specimen measures $1\frac{1}{2}$ inch, and is ovato-lanceolate in outline, and perforate at both extremities. Its wall is constructed of a felt mass similar to that already referred to, and its oral end is wider than its distal, which, though perforated, is narrower and somewhat tubular; the wall is garnished with numerous pendulous twigs, mostly placed in a longitudinal direction, but a few being hung obliquely. Although these appendages are only attached by a very small point of their length, yet they are firmly tied, so as to be torn off with considerable difficulty. These ornaments are of two different kinds, one set superiorly, long, light, brownish, and slender or flattened twigs; and the second, below which are leaves or phyllodia, short, flat, and acuminate. These are of use in concealing from predaceous birds the existence within the body of a soft caterpillar, making the case appear like a cluster of withered leaves. Their attached end is always towards the mouth end, and those nearest the neck of the sac overlap by their free extremities the attached ends of those more remote, and thus in progression they will oppose no barrier to the onward movement of the creature. This case has a slight downy lining, and contained the dried remains of the larva similar to that described and figured by Mr. Westwood.†

The fifth case (Fig. 2) belongs to another species of this genus as yet undescribed; it is elongate-oval in shape, the widest end being below; this is attached to the branch of a tree, probably an acacia, and is of a brownish grey colour, extremely soft, and light yellow within; a whitish yellow down forms a thick and copious padding in the interior, and a few fragments of the puparium existed at the upper end; long, slender twigs, few in number, ornament the outer side near the neck, and a number of thin, flat, cortical-looking dry flakes, irregular in outline, and firmly but loosely hanging on the wall. The species to which this seems most closely allied is the first unnamed case figured by Mr. Westwood, ‡ but it differs in many particulars, in not being leaf-covered, in not being similar in shape, being more distinctly fusiform, and thus may belong to a new species which might be provisionally named *Oiketicus Careyi*, after the discoverer of the case.

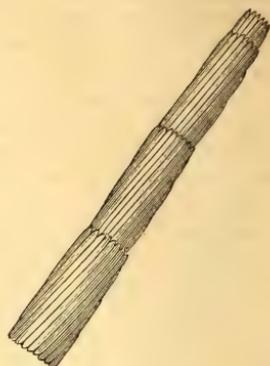
Fig. 2.

* *Op. cit.*, Pl. 26.† *Loc. cit.*, Pl. 34, Fig. 5.

‡ "Proc. Zool. Soc.," p. 228.

The sixth individual (Fig. 3) is one of very great beauty and interest. In shape it is long, slightly tapering, cylindrical, open at the narrow end, closed and fastened to branches by its thickest extremity. It consists of four or five storeys of short, regular, and very fine rods, like small grass stems. The whole structure is about an inch and an eighth in length. The first storey is about three lines and a half long; the second very nearly three lines in length; third about two and a-half; the fourth and fifth are each about two in length. Each of these are even, and the sizes of the component twigs gradually diminish to the topmost point. In the first part of the column, barely a line and a-half in diameter, there are from ten to sometimes twelve of these; in the second there are sixteen to eighteen, much finer; in the third about twelve, still smaller; the fourth and fifth vary in the number of their mural rods, but they are generally about ten in the fourth and eight in the fifth; the last storey, however, is not always present. These branches forming the wall have a slight twist, so that the two ends are not quite on the same plane, but are placed obliquely, after the plan of the chambering of an Armstrong gun. Each storey joins its neighbour very nearly at the one level, giving a remarkably regular appearance to the whole. The interior is smooth, firm, fine, and slightly silky; the adhesion of the twigs is by means of a felted material like the preceding. I have not succeeded in identifying this remarkable dwelling with the construction of any known "Sackträger." Its closest ally would seem to be the Ceylon species *O. Crameri*; but this is much shorter, and only presents three fascies—one central long bundle and two terminal shorter. This, perhaps, may be the representative of the habitation of a new species, which, upon the principle adopted by Mr. Westwood, provisionally might be named after its discoverer, Mr. Hugh Macalister, an accurate and skilful observer, as *Oiketius Macalisteri*.

Fig. 3.



From the cases themselves some assistance might be derived in the classification of this group. There are two natural divisions into which they might be arranged—first, those perforated at both ends; and, secondly, those with but one pervious end. Of the first group we have—First, those with the twigs adherent for their whole length, including *O. Saundersii* and *O. Lewinii*, distinguished from each other by the first having sticks disposed spirally and separate, and the second having but one row extending for the whole length of the sac, and being nearly closed at one end. Secondly, those with twigs pendulous, attached by but one extremity, as *O. Hubneri*. Of those in which the perforation is but at one end we have three forms—first not ornamented with twigs, as *O. Herrichii*; secondly, with irregularly disposed twigs,

as *O. Careyi*; thirdly, with even, regular fascies of twigs in storeys, as *O. Crameri* and *O. Macalisteri*.

The geographical range of the genus is not accurately defined as yet, but seems to be widespread. Species have been described from the West Indies by the Rev. Lawnsdown Guilding, from Great Britain by Westwood, from the East Indies by Westwood, from Ceylon by Templeton,* and from Australia. Some of the species even seem to have a wide range, for Mr. Westwood mentions that specimens of a Ceylon species, *O. Templetoni* (Westwood, the *O. tertius* of Templeton), were sent by Bowring from Hongkong.

The last specimen which I have to describe is one of great delicacy and beauty, and though not an *Oiketeticus*, belongs to the neighbouring family of *Bombyx*. It is an elliptic ovate sac, open at one end, and measuring two inches in length and two inches in circumference; it tapers nearly equally to both extremities. The walls were covered with short, stiff, branching hairs standing at right angles with the surface, from which they are readily detached, and they are liable, when the nest is being handled, to pierce the fingers. They are most numerous at the fundus of the sac, and become scantier towards the small jagged orifice. The substance of the wall, which is of a somewhat papyrous texture, is composed of five interlacing cylindrical threads of a silky nature. These threads are twisted, and appear interwoven roughly, differing thus from those composing the last structure, which is merely felted. The hairs on the exterior are dark brown in colour, and form very beautiful objects when viewed by polarised light. They taper from about their centre towards the base, where they are small, but obtusely pointed. Towards the free extremity they first pass cylindrically, then sending off six or eight lateral ascending pointed branches, which taper rapidly to acute apices. The continued stem ends in a stiff, sharp point, about four times the length of any of the lateral processes. These lines are made up of an external hyaline cutical matter with a slightly waved lateral border, especially towards the base, and a central granular medullary structure. A few longitudinal striæ were visible on the exterior of some of them, and a few were seen which, after a short cylindrical course, ended in a tuft of straight branches. Internally a number of fine chitinous, finely corrugated fragments of the puparium, were found, covered with a few single hairs. There were not data sufficient to name this species; it seems, however, to be a new species.

Mr. Andrews said he had listened with much pleasure to the interesting and pleasing statements given by Dr. Macalister in his paper on the larva cases from South Australia of the genus *Oiketeticus*. The thanks of the society were due to Dr. Macalister for the very pretty illustrations he exhibited of the varied forms of those cases. He hoped

* "Proc. Entom. Soc." vol. v., p. 5.

that the Society would in the Proceedings give that paper in full, and figures of the new species *Macalisteri* and *Careyi*. As such a subject was before the meeting, Mr. Andrews thought it might be of interest to show some very pretty specimens with the larva of the *Cicada Zelandica*, brought recently from New Zealand. These beautiful insects, which are the *Tettigonia Cingolata* (Fabr.), are of a lively green, and prettily barred or striated. Near Wellington, New Zealand, they are in great abundance, frequenting willows, and especially on *Cordyline Rumphii*, or *Dracæna Australis*, which forms jungles on the alluvial banks of the rivers. On a sunny day they are exceedingly noisy; their chirping sounds are heard at some distance. The New Zealand flax, *Phormium tenax*, is also a favourite locality. The Maori name for them is Tarakihi.

The following Paper was then read:—

ON TWO NEW SPECIES IN SAPROLEGNIEÆ, REFERABLE RESPECTIVELY TO THE GENUS SAPROLEGNIA (NEES V. ESENB.) AND ACHLYA (NEES V. ESENB.) By WILLIAM ARCHER (with Plate VI.).

EVEN at the risk of being, perhaps, considered as somewhat premature in coming forward to describe two new species in the family Saprolegnieæ, without being quite satisfied as to the particular genus to which I assume, from certain data afforded, that they each respectively belong, I still venture to do so, inasmuch as the reproductive parts offer abundant characters to establish them as, indeed, distinct, undescribed species, although their generic position may remain uncertain.

As is now known, the generic characters in this family seem to depend on the mode of formation and evolution of the zoospores, and the specific characters on the conditions of the sexually developed reproductive organization, and on the special figure of the oogonia. Hence, unless one be successful in finding one of these plants in a sufficiently early condition to gain a view of the formation of the zoospores, which ordinarily precedes the true fructification, its generic position cannot be definitely predicated. On the other hand, if one see the zoospores only, and thus establish the genus, but fail to get a view of the conditions of the other type of fructification, the species to which any particular plant belongs must remain undetermined. So far as more modern research goes, and so far as I have myself had the fortune to find any of these plants in a fertile state, it appears to me that here there exist various forms which, at least, seem to maintain an identity of conditions, and individually to present the same recurring characters. On this point, however, I dare not as yet speak definitively. The extended experience of various observers of these productions in their different stages may be requisite to solve the question. All we can as yet go upon is experience hitherto. The possibility that some of these forms may have stages of development which take place out of water, does not seem to speak against their indi-

viduality. The views of some authors, if hereafter borne out by future observation, that some of these run through certain early stages upon house flies—having, as is stated, actually commenced their growth in their blood—and that they perfect their development as Saprolegniæ only on falling accidentally into water, would merely show that here an “alternation of generation” may occur, not less surprising than that which has been already established in other departments. The same plants—forms which give rise to an evidently fertilized oospore—again and again present themselves. These, I should hold, must have descended either directly, or through whatever may be the characteristic intervening stages, from a similar pre-existent plant. This would, at least, appear to me a more reasonable supposition than that any number of given germs evolved from the same parent form should, some of them, develop into one definite form, with a certain set of conditions, and that others of them should develop into some other equally definite forms, with certain other sets of conditions.

Hence, I think, when we meet with certain combinations of conditions, and certain specialities in figure, of the reproductive organs, not shown by known forms in this group, we are justified in looking upon such as distinct species. The present forms, then, in themselves quite distinct, seem to demand a record.

When I met with the first form to which I would draw attention (Plate VI., fig. 1), I was momentarily under the impression that I had encountered a *gynandrosporous* type of fructification in the Saprolegniæ. The existence of this type one might, *à priori*, be disposed to believe likely, even were it not, indeed, all but directly proved by Pringsheim's observations.* But a closer inspection speedily proves, not only that there is here merely a superficial resemblance to the gynandrosporous type, but also, as will be seen, that the plant is truly monœcious, though presenting what seems to be a sufficiently noteworthy modification of the structure in other described monœcious species.

Beyond doubt, the present plant seems to be a very well-marked new species; but, as before mentioned, from not seeing the zoospore-condition, its generic location remains uncertain. However, I should be disposed to regard it as most probable that this plant, should it be again met with, may be found to appertain to the genus Saprolegnia. The reason for leaning to this genus is that, in one instance, in the mass made by the plant, three seeming sporangia evacuated by zoospores, one *within* the other, each showing a terminal opening, were observed—so far characteristic of Saprolegnia.

Setting aside, however, the generic characters, this plant is specifically characterized (I believe from every other Saprolegniaceous plant yet described) by its true fruit, in the following manner:—

Saprolegnia androgyna, sp. nov. Fig. 1.

* “Jahrbücher für wissenschaftliche Botanik,” Band ii., p. 213, “Nachträge zur Morphologie der Saprolegnien.”

Plant monoecious; oogonia large, barrel-shaped or elliptic, mostly in an uninterrupted terminal series, though occasionally interstitial; the terminal oogonium the oldest in a series, the oogonia thus showing gradually different degrees of development down to the basal one, which is the youngest; the lateral male branches (Nebenäste, Pringsheim), with the exception of those fertilizing the lowest oogonium of a series, are not derived either from the principal stem of the plant, or from any neighbouring portion of the general plant, but these are given off from the oogonium itself which is next immediately beneath the oogonium which is fertilized by them, and so on down to the lowest or basal oogonium of a series, to which last are given off lateral male branchlets from the original filament or stem immediately thereunder. The tube or cavity of each lateral male branchlet becomes shut off by a septum formed a short distance above its origin, the portion of the contents above the septum being developed into the male element—that portion of the contents below the septum retaining its characters, and being returned back into the oogonium, whence it originated, in time to become employed, with the remainder of the contents, in the formation of the oospores. Oospores large, about $\frac{1}{8}$ th of an inch in diameter, mostly numerous, but very variable in number—sometimes, though rarely, as few as even one. They occasionally exhibit what appears to be a roundish excentric vacuole. The whole plant large and coarse as compared with other described forms in this family.

If thus, for sake of illustration, we call the upper (mostly terminal) oogonium A, that beneath it B, that beneath the latter C, and so on down, let us suppose, to G; then oogonium A is fertilized by the lateral male branchlets emanating from and in direct continuation with B; the oogonium B is fertilized by the lateral male branchlets, in the same way emanating from C, and so on down to F, which is fertilized by the male branchlets emanating from G; but G is itself fertilized by the lateral male branchlets emanating from the supporting stem, for G has no oogonium beneath. So, of the whole chain of oogonia, the oospores in each, those of the lowest one excepted, are fertilized by the male elements derived from the branchlets given off by the oogonium immediately below. The terminal oogonium does not, of course, give off any male branchlets; they would have no duty to do, no function to perform. The contents of the oogonia, which in their turn successively give off lateral male branchlets, do not become formed into oospores until the septa, cutting off the upper portion to become the male element, are duly formed in the branchlets, nor until the granular contents beneath such septa become turned back into the oogonium in time to participate with the remainder of the contents in the formation of the oospores. As in other Saprolegniæ, the whole contents of each oogonium become used up to form the oospores, whatever may be their number. The male branchlets seem to penetrate the wall of the oogonium at any accidental point, no special apertures being formed in anticipation, thus unlike certain forms as described by Pringsheim.

Thus, this species, whilst it agrees with other monoecious forms in

the character implied, differs from them in presenting so curious an example of confusion of parts with a maintenance of clear distinctness of function—a male-female or a female-male, yet male and female elements distinct *per se*. In this character, then, it differs from every Saprolegniaceous form described, as well as (with another form, to the figures of which I shall presently draw attention), in the oogonia being formed, not solitary and terminating lateral branches, but in a usually uninterrupted series, mostly terminating a filament, but sometimes produced at some point along its length.

On looking at this plant at first sight, from what has been said, it will not, perhaps, appear surprising that it should have been momentarily taken as a gynandrosporous form—the lateral male branchlets emanating from each oogonium, and reaching up to the oogonium immediately above, looking not unlike dwarf male plants of separate origin seated on the outward surface of each oogonium. But a closer examination reveals their true nature, and proves that these are in direct continuation with the oogonium giving them off, like the thumb of a glove; but casually viewed, however, there is, no doubt, some amount of resemblance to the gynandrosporous type, and I even looked for some time for the male element in another direction, trying to find the mother-cells of androspores; but this was only when I had as yet seen but a single specimen of the fruit, which did not show its true structure as clearly as the numerous ones which afterwards presented themselves.

The second form to which I venture to direct attention is a diœcious plant (figs. 2–6). Unfortunately, however, as in the previous instance, I did not meet with it in a stage sufficiently early to see the evolution of the zoospores, and thus to determine the genus. Still, combining two indications furnished from other sources, presently to be mentioned, the evidence seems sufficiently strong to point to the genus *Achlya* as the proper location of this species.

I have mentioned that this form is diœcious, but I had the good fortune to meet with the empty mother-cells only of the spermatozoids. Their structure and mode of development, however, agreed so completely with that part of the fructification in *Achlya dioica*, as figured by Pringsheim, that there is no need here to give a drawing.* A terminal portion of one of the tubular filaments of which the plant is composed was divided by transverse septa into several cavities, two or three-times longer than broad; these cavities were densely filled by empty globular hyaline coats, which had evidently been evacuated by the contents. The only difference from Pringsheim's figure consisted in these special mother-cells being somewhat smaller and more numerous.

Now, whereas in *Achlya dioica* (Pringsh.) the spermatozoids are produced by unskinning from a special mother-cell, as are also the zoospores, so also I think we may feel justified in assuming from analogy, inasmuch as the spermatozoids in the present instance are formed by

* "Jahrbücher für wiss. Bot." Band. ii., t. xxiii. fig. 2.

unskinning from a special mother-cell, that likewise so too are the zoospores. If so, this plant would fall under the genus *Achlya*.

Another indication pointing to the genus *Achlya* is as follows:—

In this new species, not infrequently just under a terminal oogonium, the main filament gives off one, or two, or three lateral branches in a kind of proliferous manner, and these are usually of considerably less diameter than that of the supporting stem. These, at first sight, might be supposed to look not unlike what might be intended to become lateral male branches (fig. 5), sufficiently puzzling after one has previously found that the species is a dioecious one; but when we notice that the oospores are here fully formed, and yet that this lateral branch still retains its contents, and is not in contact with the oogonium, such a mistake is prevented. Such a form as that drawn in fig. 6 at once, however, explains the former case. Here we see the ends of these become inflated, densely filled with contents, and shut off as oogonia. In these secondary oogonia I never noticed more than one oospore, although the first-formed oogonia might contain perhaps as many as eight or ten, though ordinarily fewer.

Now, this proliferous manner of growth is the second circumstance which points to the genus *Achlya*. In that genus the zoospores, besides being the product of a number of a special mother-cells (not, as in *Saprolegnia*, simple primordial cells formed from the contents of the sporangium), the sporangia themselves are, moreover, produced, one or more generations after the first, by being given off laterally at the base of the first (not terminal, as in *Saprolegnia*, and the new sporangium being pushed up within its now empty predecessor). Now, may not this tendency, seeming inherent in *Achlya*, to put forth fresh growth laterally, when about to form new sporangia, be again evinced when about to put forth new oogonia? May not this kind of innovation, so to speak, be characteristic of the genus *Achlya*, so far as it is worth?

The following may serve as a description of this plant:—

Achlya cornuta, sp. nov. Figs. 2-6.

Plant dioecious; oogonia large, mostly terminal, often in an uninterrupted series, the outer wall drawn out into numerous horn-like extensions of varying and often considerable length, sometimes bifid; the apex of the terminal one drawn out generally very long, and occasionally the supporting filament or stem giving off lateral branches by a kind of proliferous growth, each of which eventually terminates in an oogonium of a similar character, but usually of smaller size; oospores large, one or several in an oogonium; mother-cells of spermatozooids as in *Achlya dioica*. I have not been able to see any openings in the wall of the oogonium; they may doubtless exist, but the densely arranged cornua render the examination with this view very difficult. De Bary himself, in his *Aphanomyces stellatus*, found the same difficulty from the same cause. The uppermost oogonium is the oldest or first formed; the lowest the youngest or last formed, in the series.

Here, as is seen, the oogonia occur in a continuous series, several being in succession, separated merely by a septum, or they may be few

or even solitary; they mostly terminate a filament, and rarely occur along its length. In this respect they differ, so far as I know, from those of other Saprolegniæ recorded, except *S. androgyna* above described; but, if I am right, this form not only falls under a distinct genus from that just described above, but, even if the evidence were in favour of their belonging to one genus, they are abundantly specifically distinct in that the present plant is diœcious, the former monœcious, and that on a seemingly novel plan. Moreover, *A. cornuta* is altogether distinct, owing to the remarkable horn-like extensions, numerous and often long, and occasionally bifid, which are presented by this form: on one occasion a curious depressed and equally lobed form of these cornua presented itself (fig. 4, the second oogonium to the right near the base). This reminds one somewhat of the form of the oogonium in *Edogonium Itzigsohni* (de Bary); and to those who have seen that plant in fructification the comparison will at once call to mind the figure of this peculiar lobed extension. I, of course, mean to institute no further comparison between them. This new species, too, seems thus quite distinct from *Achlya dioica* by the character mentioned. *A. dioica* has globular oogonia, destitute of cornua, and are seemingly always solitary—in fact, so far as they go, quite like those of *Saprolegnia monoica*, except that they are smaller. The projecting cornua call to mind the similar but smaller ones of *Aphanomyces stellatus* (de Bary);* but, setting aside the evidence of this plant belonging to the genus *Achlya*, all the species of *Aphanomyces* described are monœcious, that is, furnished with lateral male branchlets emanating from another part of the filament. As regards *Saprolegnia asterophora* (de Bary), † even setting aside, as in the previous comparisons, the evidence as to the generic location of this plant in *Achlya*, it is again well distinguished by being diœcious, whilst *Saprolegnia asterophora* is, like *Aphanomyces stellatus*, monœcious. It is, besides, different from all these forms mentioned by its larger and coarser size, as well as often producing several oospores in the oogonia, whilst all the species referred to very rarely produce more than a single oospore.

* Jahrbücher für wiss. Bot., "Bd. ii., p. 178, t. xix., 1-13.

† *Loc. cit.*, p. 189, t. xx., 25-27.

WEDNESDAY, MAY 2, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the Chair.

The Minutes of the preceding Meeting were read, and confirmed.

NOTES ON *TÆNIA MEDIOCANELLATA* (KÜCHENMEISTER), (*T. INERMIS*, MOQUIN-TANDON), BEING ITS FIRST RECORDED OCCURRENCE IN IRELAND.
By DR. W. FRAZER, M. R. I. A., Honorary Member Medical Chirurgical Society of Montreal, &c.

TAPE-WORM cannot be considered a common affection in Dublin, nor does it seem very prevalent in any part of Ireland. From patients seen in private practice, I have seldom obtained more than three to six specimens each year on an average, though sometimes two or three of these cases will present themselves in rapid succession. The subject of entozoa having recently attracted more of my attention than usual, I became convinced, from investigating the history and symptoms complained of by those individuals I had seen, that there were in Ireland at least two distinct varieties of tape-worm, which I had before always confounded together, and failed to determine their specific characters with that strict carefulness the question demanded, and there were grounds for concluding these would prove to be the common *T. solium*, and its more formidable relation, *T. mediocanellata*, a correct description of which we owe to Küchenmeister. My surmises respecting the latter worm received ample confirmation a few days since, by a gentleman bringing me the specimen now recorded, which, so far as I can ascertain, is the first recognised example of *T. mediocanellata* of indigenous origin.

The host of this parasite, a gentleman in the prime of life, of robust frame, in perfect health and good condition, consulted me for an eruption of isolated patches of psoriasis scattered over his limbs and body. He also stated that for at least fourteen years past, and possibly for a longer period, he was infested with tape-worm. Its presence caused him great annoyance, as the mature isolated joints of the animal passed from him at irregular intervals, with or without alvine dejections, several of them in succession escaping whilst he was walking about his occupations, or when warm in bed. He had endeavoured to get rid of his unwelcome guest by using the ordinary round of vermifuges, and related his experience with Kosso and Kamela. He preferred the Kamela, its dose being smaller and therefore easier taken, and it had the advantage of being tasteless; he also thought it more effectual, for he succeeded by its means in removing (besides a few small detached fragments) one continuous mass of adhering joints, 15 feet in length, which he measured after its expulsion, whilst still alive and in motion.

He was anxious to have his pest thoroughly expelled, and volunteered, with this design, to carry out any reasonable directions. I recommended him to take early in the morning a full dose of castor-oil, and use for that day soft food and soup, &c., to expose the animal more

completely to the action of the special vermifuge selected. This consisted of ethereal extract of male fern, which he took fasting next morning, made into emulsion with yolk of egg, and flavoured by essence of peppermint. It operated briskly, and expelled, quite dead, a good specimen of *T. mediocanellata*, which measured seven feet in length in one unbroken piece, in addition to some small segments and detached joints belonging to the upper portion of the animal. The head was not obtained, it seldom comes away with the joints after medical treatment, at least far less often than is supposed. As these creatures contract in size considerably after death, its length, when living, must have reached eight or perhaps nine feet.

The constitutional symptoms caused by this worm were obscure, and insufficient to diagnose its existence, which was best recognised through the constant expulsion of its joints. Close inquiry elicited from the patient that his appetite was irregular, and at times craving, that he felt uneasiness and unpleasant sensations in his left hypochondriac region, and, though more seldom, some pains were experienced in the region of the heart, and extending down the left arm.

The proglottides at the upper portion of the animal are considerably broader than long, the transverse exceeding the longitudinal measurement by at least five or six times. Seventeen of these adhering segments occupy a space of one inch. They are easily detached from each other, possessing slight cohesion when compared with the more developed and larger joints. About eight inches lower down fourteen segments were contained within the inch. After this they rapidly became elongated, and assumed the ordinary appearance of common tapeworm, but the ultimate large segments reached the bulk of 6-10ths of an inch. This striking resemblance of the upper joints of *T. mediocanellata* to the broad shallow joints of the rare *Bothriocephalus*, or Russian tapeworm, is a distinctive character of the animal. They are easily separated by observing the different position of the sexual aperture, which is lateral in the *Tænæ*, and median in *Bothriocephalus*.

To sum up the principal distinctions which separate the two tapeworms found in these countries, the following brief particulars will suffice:—

1st. *T. mediocanellata* is a larger animal, it acquires greater length, is thicker, and its segments broader than the *T. solium*. According to Küchenmeister, when mature, its average length is at least double that of the latter.

2nd. The proglottides are reproduced with great rapidity, and are remarkable for the freedom with which they escape from the patient: “proglottides permagnæ et pervivaces, sæpissime sponte et sine fœcibus humanis ex ano demissæ.”

3rd. Its head, which, as already mentioned, is seldom obtained by medical treatment, is “unarmed.” It presents no ring of hooklets, is destitute of rostellum, and studded by four conspicuous dark-coloured suckorial discs or acetabula.

4th. The sexual apertures, which are disposed in *T. solium* with considerable regularity on alternate sides of the successive joints, are distributed in mediocanellata with exceptional irregularity of arrangement, though always opening on the lateral aspect; they are conspicuous apertures that lead to a complicated, much branched, and peculiarly arranged sexual system. The trivial name of the entozoon is derived from a median thick-walled canal or tube, which Küchenmeister considers continuous, extending from joint to joint.

Experiments carried out by Leuckart, and repeated by Meisner and others, have traced the development of this cestoid animal with much success. When calves are fed with mature joints they soon suffer from severe febrile symptoms, and other evidences of acute disease; after a short time their muscles are found permeated by innumerable minute hydatid cysts, each containing within its cavity heads of cysticerci, resembling in every particular those of the mature worm. Leuckart failed in inoculating the sheep or the pig, and other observers have confirmed his statements.

Professor Aitken, at Netley, obtained several specimens of this tapeworm from soldiers, principally from men who had returned from serving at the Cape of Good Hope, and Professor Cobbold remarks in his work on Entozoa that he was surprised on looking over the collection of tapeworms at Middlesex Hospital, to find at least half their number referable to this species. I believe it will be found equally common in Ireland with the ordinary *Tænia solium*, though the present instance is the first I am acquainted with in which its characters were recognised, and its claims advocated to be considered a member of our indigenous fauna.

The following paper was then read :—

NOTE ON "ASTERIDIA" OCCURRING IN *PENIUM DIGITUS* (BRÉB.)
By WILLIAM ARCHER.

SOME time ago I made a gathering of some minute Algæ from a pool near Enniskerry, on the road going towards Lough Bray. Amongst these a number of globular, densely-spined bodies, with green contents, conspicuously presented themselves. The spines densely covering these were very numerous, very slender throughout, and acute. The bodies themselves were mostly to be found distributed in pairs over the field of view. These might easily be taken for so many zygospores of some desmidian; but, much as such a structure resembled a possible zygospore, these bodies were not like that known of any species of the family of Desmidiæ, nor was there any evidence in the gathering that they might actually be zygospores of any form not yet known in the conjugated state.

Hence, but for an observation made by me on a previous occasion, the source of these curious bodies would have been not a little puzzling.

In a gathering which I had made in the previous year—not, however, from the same locality—I took a quantity of the common desmidian, *Penium digitus* (Bréb.), and a considerable number of them showed, some individuals one, the majority two, and a few three, quite identical stellate bodies in the interior of each cell; these seemed to me evidently to have been formed at the expense of the individual *Penium* in which they occurred. Some of the *Penia* showed their cell-contents partially absorbed, and the remainder dead and brown; whilst others did not exhibit a trace of the original contents, but contained the (generally) two spinous bodies, green and vigorous, one in each half of the old cell-cavity of the *Penium*, the outer wall of which still enveloped them, but afterwards these bodies might be found abundantly without the encompassing old membrane of the *Penium*, and usually distributed in pairs over the field (Pl. VIII., Fig. 4).

Now, although in the second instance (the first here mentioned) in which I had found these curious-looking spinous or stellate bodies I was unable to trace them back to a *Penium*, their identity in appearance in every way, and the fact of their having been found distributed in pairs (as if left behind by the dissolved or decayed outer membrane of a *Penium*), seems most strongly to indicate that both were one and the same thing, and, in fact, that in both instances these spinous bodies owed their origin to *Penium digitus*.

These bodies are, in fact, the “Asteridia” of the *Penium*, to adopt Shadbolt’s and Thwaites’ term as applied to the still enigmatical stellate or spinous bodies occurring within the cells of other *Conjugatæ*,* and, like such similar bodies, these, too, must be regarded, I apprehend, as parasitic growths. These are, indeed, altogether unlike the smooth, rounded, or irregularly-shaped, opaque, brownish, spore-like bodies often seen in various species of *Desmidiæ*, whose nature continues equally problematical. The latter, indeed, may be possibly related to *Chytridium* (Al. Br.), or to *Pythium* (Pringsh.).

In the same gathering I presently noticed likewise a number of slightly smaller green and smooth cells, in some of which a directly transverse well-marked light line could be seen, indicating a commencing self-division. A few such bodies were seen loosely invested by a colourless coat, which coat was externally covered by slender spines; these loose external coats stood off somewhat from the inner spherical, smoothly rounded bodies; the latter afterwards made an exit by a large rent in the spinous outer coat.

Now, Pringsheim records a similar condition in certain “Asteridia”

* Similar bodies also occur in the cells of other plants—as, for instance, in *Nitella*—as recorded by Reinsch (“Morphologische, anatomische und physiologische Fragmente,” p. 8, t. ii., f. 11). Shadbolt first mentioned them in a *Ulothrix*, and de Bary has observed similar in *Vaucheria* (*op. cit.*, p. 62). Pringsheim, de Bary, and Reinsch seem to lean to the view that they are of parasitic nature.

in a Spirogyra,* and I have myself seen the same slipping-out by a rent in the spinous outer coat of the "Asteridia" in a Mesocarpus, and the commencement of self-division. Therefore, be the true nature of the so-called "Asteridia" (Shadbold, Thwaites) what it may, there can be little doubt but that the bodies I describe belonging to *Penium digitus* are of one and the same nature.

Thwaites† and Pringsheim‡ seem to hold that these bodies are not at all formed at the expense of the contents of the cell of the Confervoid in which they occur, and yet they both seem to regard them as of truly parasitic nature. If the former view be correct, they could not be parasites in the strict sense of the word. But here, in the case in question, though these "Asteridia" were with green contents, like the other forms hitherto noticed, the fact of the original contents of the *Penium* seeming to have become in most instances all absorbed, or if not all absorbed, the residue becoming quite effete and brown, seems to speak for their actual parasitic nature.

It is true that Itzigsohn has sought to establish that these "Asteridia," as well as the very different bodies he calls "Spermatosphæria," are not parasitic, but to be regarded as forming a part of the fructification of the plants in which they occur: that they, in fact, represent the male element, and that their contents exert a fertilizing influence on the remainder of the contents of the original cell in which they occur; nay, he even circumstantially explains the process by assuming that the spines are tubules through which permeate whatever the influence may be which is supposed to emanate from the "Asteridium" to the remainder of the contents of the original cell—a curious fertilization truly, which in *Penium digitus* kills what it acts upon. This fancy seems to find a kind of parallel in Hassal's somewhat similar assumption, that the nucleus in Spirogyra is the male organ, the fertilization of the parietal contents being assumed by him to be effected in some unexplained way through the agency of the protoplasmic threads radiating therefrom.§ But these assumptions need nowadays, I should think, no refutation; Pringsheim has long demolished several of Itzigsohn's hypotheses. The fact is that, while imagination has been largely drawn upon to find a reproductive process in Conjugatæ, the true one has been overlooked and been regarded as simply a fortuitous or insignificant act; because the process of *conjugation* is so common and so simple, it is ignored, though the many grades and phases, in the various types which it presents, speak loudly, as it seems to me, for an acknowledgment of its true significance.

* "Zur Kritik und Geschichte der Untersuchungen über das Algen-Geschlecht," p. 46.

† "Annals of Natural History," vol. xvii., p. 262.

‡ *Loc. cit.*, p. 47.

§ "British Fresh-water Algæ," Intr., p. 6.

Although, then, this crude note possesses no value in assisting to throw a further light on these problematic structures, yet perhaps it may not be considered altogether without interest, for the following three reasons:— (1), that their strictly parasitic nature in this instance seems to be rendered very probable by reason of the destruction of the Penium during their formation; (2), as being the first instance (so far as I am aware) of the occurrence of "Asteridia" in the Desmidiæ; and (3), as being of a form and size not before noted in any of the various "Asteridia" recorded (Fig. 4). So marked, indeed, in appearance are the present examples, and looking at the same time upon "Asteridia" in general as parasitic growths, the idea becomes suggested that there may be distinct and constant forms amongst them, and that collectively they ought to form a distinct genus. This suggestion I venture only to throw out; its confirmation or refutation will depend, of course, on time and on a great number of independent observations.

After which was likewise read the following paper:—

ON THE CONJUGATION OF *SPIROTÆNIA CONDENSATA* (BRÉB.), AND OF *SPIROTÆNIA TRUNCATA* (ARCH.). By WILLIAM ARCHER.

THE two minute unicellular algæ which form the subject of the following brief communication belong to a genus—*Spirotænia* (Bréb.)—comprising several well-marked forms.

Most of these species are rare. In certain localities, however, the first species now in question, *Spirotænia condensata* (Bréb.), is common; the other, *Spirotænia truncata* (mihi), belongs to the most rare, having been, so far as I am aware, found only by myself, and that in but one locality ("Feather-bed" Mountain). But it is not to be understood, as regards *Spirotænia condensata*, that any waters may present this pretty species, for it must be sought for in suitable situations; then, indeed, it is frequently encountered.

But often as *S. condensata* presents itself to notice, distributed, as it appears to be, in Europe, and familiarised, as we cannot fail to be, with this the commonest and at the same time the most beautiful representative of its genus, both it and its congeners have hitherto resolutely refused to reveal to us their mode of fructification or reproduction. Yet all the species are very constant to their characteristics, and one could not resist the feeling, as regards them, unlike, perhaps, many of the simple plants, that they must prove to be truly *sui generis*.

It is true, indeed, that *à priori* we would be justified in assuming that the mode of reproduction in this genus, like that of *Spirogyra*, &c., when found, would be seen to be by conjugation, and hence the genus has been by most authors referred to the Desmidiæ; nevertheless, pending a knowledge of the actual process from direct observation, the true position of the genus has remained hitherto in doubt. Thus, only the other day, in Reinsch's lately published work on 'The

Freshwater Algæ of Franconia,* it is stated by that writer—"The position of the Spirotæniæ in the system is still very uncertain; they belong, with Eremosphæra, most probably to the Palmellaceæ." Again, in de Bary's work on the Conjugatæ, as regards this genus, he states—"On account of the fructification being unknown, the position of the entire genus is not quite certain."†

That this genus should be relegated to the Desmidiaceæ will, I think, be considered proven from the following description of the conjugated state, as it differently presents itself in two distinct species, now for the first time recorded, and this notwithstanding Reinsch's views expressed on the conjugation in Palmogloea,‡ a genus he still retains, notwithstanding de Bary's beautiful researches.§

Before, however, proceeding to describe the conjugation of *S. condensata*, it would seem to me to be desirable to draw attention to the seemingly noteworthy fact, that in this species the nucleus is parietal, not central. It forms a somewhat large elevation, rounded on one side and straight on the other, the convex side projecting into the cavity of the cell and gradually sloping off all round, and its flat side towards the wall; it is ordinarily placed equidistantly from either end of the Spirotænia. It has imbedded in the very centre a minute, light-coloured, distinctly marked nucleolus. The broad spiral band of endochrome, in making its revolutions, twice underlies the body of the nucleus, which fact will convey an idea of the extent of space covered by its flat side. The nucleolus always occupies a position just over the vacant interval between the two parts of the spiral band which underlie the nucleus, thus the more readily disclosing itself to view, as there is there no chlorophyll-mass intervening to obscure or hide it.

The figure described for the nucleus is, of course, that presented by it when seen from the side; when seen from above or below it naturally offers a rounded outline, and might then be readily taken as a globular and central nucleus.

It must be noted, however, that this characteristic of the nucleus is plainly to be seen only in specimens kept for some time in the house; in such examples the band of endochrome becomes much more sharply defined, with a smooth edge, like a little ribbon—those granules, which ordinarily are more or less scattered, and which thus tend in a certain degree to obscure the actual characteristic spiral arrangement of the endochrome, seem then to be absent—then the nucleus and its nucleolus come out to view in perfection. Indeed, it is hardly possible to see a more elegant object than a favourable specimen of this handsome species, which shows the nucleus in side view and the light so shed from the condenser as to fully illuminate the whole cavity, and clearly to display its characteristic and beautiful arrangement.

* "Die Algenflora des mittleren Theiles von Franken," p. 203.

† "Untersuchungen über die Familie der Conjugaten," p. 75.

‡ Reinsch, *op. cit.*, p. 202.

§ De Bary, *op. cit.*, p. 30.

I have not yet been able to detect a nucleus in any other species of Spirotænia; perhaps, as in *S. condensata*, it requires favourable circumstances to reveal it. I am, however, the more desirous to draw attention to it as it exists in the species under consideration, inasmuch as it forms a seemingly noteworthy exception to other Desmidiaceæ in this regard. In all other species in which the nucleus can be seen it is orbicular and central; nor does de Bary, in his work on the Conjugatæ, draw attention to the peculiarity in this species which I have pointed out—nay, his figure* leads to the idea that he regarded the nucleus as central; but this may, indeed, arise from his having seen and drawn it either from above or below, and not from the side, which, as I have shown, would be deceptive.

Another reason which causes me to think it advisable that attention should be drawn to the form and position of the nucleus in this species is the possibility that observers might imagine, upon casually viewing an example, that it perhaps represented nothing but a detached joint of a Spirogyra. Such a mistake, indeed, I could hardly imagine possible when sufficiently closely examined; but even if it be possible, I think, due regard being had to the circumstance that the nucleus in *Spirotænia condensata* is semiorbicular and parietal, whilst in Spirogyra it is equally compressed and central, ought at once to preclude the chance of any confusion.

To pass on to the conjugated state.

When I first examined the gathering, in which this species occurred more than usually copiously, my attention was attracted by the number of cells lying side by side over the field of view in parallel pairs. Under such circumstances it is always well not to lose sight of the specimens of whatever species may be so encountered, as it betokens impending conjugation; accordingly I placed these aside for further observation. Nor was there any disappointment in this case.

The following is the process:—

Shortly the cell-contents of each opposite parent cell so lying side by side become separated into two portions, which by degrees become more and more contracted into a shorter and shorter elliptic mass. As the contraction of each half of the contents of each cell advances, the spiral arrangement becomes more and more obliterated, until finally there is little or no trace left of the original spiral band (Pl. VIII., fig. 5.).

It is to be regretted that the observation is here insofar incomplete that I can give no record of what becomes of the nucleus during this process. Even though it disappeared along with the separation of the cell-contents into two portions, and were there actually a new nucleus formed in each half, they could not be indeed now seen, as the green contents become so much more densely packed than when, as a spiral band, they occupied the whole cavity of the parent cell.

* *Op. cit.*, t. v., Fig. 12.

The outer wall of the parent cell, now enclosing the two elliptic masses of contents, is still to be seen (fig. 5); it is thin, and hardly presents a double contour. By degrees it seems to get more and more faint, vanishing finally, probably by solution.

Now begins the conjugation. Each elliptic mass derived from one of the parent-cells passes over and becomes conjugated by complete fusion with the corresponding opposite portions derived from the other parent-cell (fig. 6). That is, although the two portions of each original parent-cell may now be regarded as physiologically distinct sister-cells, being in fact daughter-cells without a special wall, they do not conjugate with each other, but with the respective halves or daughter-cells opposite to them. In other words, regarding the original parent-cells as placed side by side vertically; the upper half of the contents of the left-hand cell becomes conjugated with the upper half of the contents of the right-hand cell, whilst simultaneously therewith the lower half of the contents of the left-hand cell becomes conjugated with the lower half of the contents of the right-hand cell. Consequently, in every case of conjugation in this plant there are two zygospores formed, the four masses having become mutually amalgamated into two.

At an early stage each zygospore becomes surrounded by a *halo* of mucus, which by degrees seems to become more and more dense and more definitely bounded. Each nascent zygospore, at first of a more or less irregular figure-of-eight shape, finally wholly coalesces to a spherical form; and each then acquires a definite, smoothly bounded cell-wall, the contents being densely granular (fig. 7).

Now, if observation ceased here we should have but an inadequate and imperfect idea of the ultimate characteristics of these pretty and singular zygospores. On keeping the specimens, it was found that they were not destined to remain, like the zygospores of some species, absolutely smooth, and without external decoration. Presently there begins to arise what seems to be a kind of border of short linear spines, when an optical section, as it were, is brought into focus (fig. 8). But a more close examination shows that this is not a covering of spines, but the beginning or basis of a honeycomb-like structure all over the surface of the zygospore, and the spine-like lines are merely the angles of the cells of the "honeycomb" structure, a little thicker than their walls. By degrees this "honeycomb" structure rises and enlarges; its cells become deeper and deeper; then the walls of the cells of the "honeycomb" become a little rounded externally, and each zygospore is complete (figs. 9, 10).

By focussing an empty cell-wall of a zygospore, one can see down into the cavities or "cells" of the "honeycomb" structure at that part of the globe nearest to the observer, and by degrees more and more obliquely as they pass round to the circumference, where they are, of course, as in the zygospore retaining its contents, seen sideways (fig. 11). By describing this remarkable structure as "honeycombed," I do not mean to infer that the cells, or cavities, or interspaces are al-

ways hexagonal; they are, indeed, more or less irregular, being three-, four-, five-, or six-sided.

Thus, the conjugated state of this most marked species presents two noteworthy characteristics—one the doubly formed, as it were twin, zygospores; the other the remarkable “honeycomb” structure externally decorating them. The doubly formed or twin zygospores have their parallel in a very few instances only, such as *Closterium lineatum* (Ehr.), and *Closterium Ehrenbergii* (Menegh.). In these the conjugation of the parent pair of cells gives rise to two spores, not one only, as in by far the overwhelming majority of instances. But, though so far agreeing with the species mentioned, there are differences of detail, as is seen, proper to the species now in question.

In the second circumstance, the “honeycomb” structure, this zygospore is, so far as I know, absolutely unique.

Indeed, these zygospores could not possibly in themselves be mistaken for any other unicellular algal form that I know of, if examined with the requisite degree of attention. Viewed under a moderate power, there is just a possibility of the curious “asteridium” recorded by me, appertaining to *Penium digitus*,* being confounded with it (Fig. 4). The densely arranged short, linear spines of that structure form to the eye a kind of border, which momentarily might be thought to resemble the border produced by the honeycomb structure on the zygospores of *Spirotænia condensata*; and the bodies themselves are, moreover, much about the same size. The prevalent occurrence in pairs, too, of the former, after the original wall of the *Penium* has disappeared, might help to lend them a further resemblance. But I need hardly insist on their wide distinctions when carefully viewed; yet it is, perhaps, not quite out of place to draw attention to these very different structures simultaneously.

As regards the second species of *Spirotænia* which it has been my good fortune to find conjugated, *Spirotænia truncata* (mihi),† I regret that I cannot give any account of the early stages of the process. I am only in a position to offer a figure of the fully-formed zygospore. Here, as in by far the most of the *Desmidiæ*, there is one spore only formed. It is, however, of a novel form, so much so as that I feel satisfied it could not be mistaken for that of any other species whatever yet known, nor for any other described unicellular algal structure. The zygospore here is equally lobate, the lobes or projections being of a triangular or conical outline, the apices subacute; there are no spines; the tint of the cell-membrane appears to be of a kind of straw colour, and the contents seem to form a globose mass in the centre, leaving the angular lobes void. The four empty halves of the pair of parent-cells seem to remain loosely appended, each pair diametrically opposite to the other, the zygospore between (Fig. 12).

* *Ante.*, p. 144.

† “Proceedings of the Natural History Society of Dublin.” vol. iii., p. 83, Pl. II., Figs. 29–31; also “Quarterly Journal of Microscopical Science,” N. S., vol. ii., Pl. XII., Figs. 29–31.

As regards the plant itself in the unconjugated state, I might mention that the cells seemed to be somewhat more minute than when I saw it on the first occasion; also the spiral band was rather more narrow and definitely margined, and sometimes appeared to branch or subdivide, and the enveloping gelatinous envelope was less marked. The latter circumstances might, perhaps, be accounted for, as in *S. condensata*, by the gathering in which they were detected being for some time in the house. But though the spiral band was more sharply defined, and any scattered granules likely to impede the view into the interior of the cavity of the cell were likewise fewer than when I previously had seen this species, I was yet unable to perceive a nucleus satisfactorily. The narrow truncate extremities and the characteristic little space in each, now with one quiescent darkish granule, were there as before, which, combined with the solitary band of endochrome and the cylindrical figure, tapering towards the ends, rendered it without doubt one and the same plant. I was much pleased, therefore, to find this very distinct species a second time after so long an interval, especially in the conjugated state, forming, indeed, the second known instance of conjugation in the genus.

I have alluded to the recent work of Reinsch, in which he denies to "*Palmoglæa macrococca*" (Kütz.)—more properly, surely, regarded as a species of *Mesotænium*—a place amongst *Desmidiaceæ*, and this because he believes the plan of conjugation in that plant to hold a middle place between that of a typical *Desmidium* and the *Zygnemaceæ*. He holds that each parent-membrane of the conjugating cells of *Mesotænium* (which, notwithstanding the heterogeneous and incongruous character of Kützing's genus *Palmoglæa*, he still is inclined to refer thereto) actually takes a share in the formation of the zygospore itself—nay, even that the two coalesce so as to form its special membrane, and that hence it cannot be placed with *Desmidiaceæ* on the one hand, nor with *Zygnemaceæ* on the other. At least, then, a place in the *Desmidiaceæ* could not be refused to *Spirotenia condensata* nor to *S. truncata* on the same grounds. Here, manifestly, the parent-membranes take no share in the formation of the zygospore—not even so much as to form a connecting canal, as in *Spirogyra* or *Zygnemaceæ* generally. But, though it may be in a measure apart from the subject proper of this communication, I cannot refrain from expressing my conviction that Reinsch is in error in the view he expresses as regards the process of conjugation in *Mesotænium* (*Palmoglæa macrococca*, Kütz.). I venture to say that here the membranes of the parent-cells do *not* take a part in the formation of the zygospore, but that during the conjugation they are gradually thrown off, and probably become dissolved, and help so to increase the surrounding gelatinous matter. They, in fact, come away, leaving the contents to become mutually fused, quite as they do in *Penium* or in *Cylindrocystis*, &c., only they are more fugitive. See on this point de Bary's figures* in *Mesotænium* as well as *Cylindrocystis*,

* "Untersuchungen," &c., t. vii.; also my own communication, "Proceedings of the Natural History Society of Dublin," vol. iv., p. 12, Pl. I., Figs. 8-14, *Mesotænium*, and

which genera, along with some others, as well as some as yet uncertain forms, make up the old incongruous genus *Palmoglœa* (Kütz.).

That in *Spirotœnia*, as in other *Desmidiaceæ*, the new growth, during self-division, is produced between the two older halves, seems evidenced by the blunt extremities as seen after division, and by the varying position of the nucleus as regards the extremities. The genus *Spirotœnia*, in fact, seems as truly to belong to *Desmidiaceæ* as do *Penium*, *Cylindrocystis*, or *Mesotœnium*; the place, in fact, which has been assigned to this genus so long, even though it were but provisionally, seems to be its legitimate position, sustained as that view is by the fact, now here for the first time recorded in two species, that its fructification takes place by conjugation.

THURSDAY EVENING, JUNE 6, 1867.

ROBERT CALLWELL, M. R. I. A., President, in the Chair.

The Minutes of the preceding Meeting were read, and signed.

DR. JOHN BARKER sent for exhibition a Skeleton of *Platycercus eximius*, or Rosehill Parroquet. In Dr. Barker's absence, the Honorary Secretary read the following letter upon the skeleton exhibited:—

“The matters which I think worthy of attention connected with the skeleton of the Parroquet exhibited are—first, the absence almost entirely of furcula, and the immense size of the breast-bone, its depth being almost as great as in any other bird I have dissected. It may be in the recollection of the Society that I exhibited a specimen of a Parroquet in which the furcula was altogether absent. This was what was called the Carolina parrot. In this bird there was not a vestige of furcula, and although the keel of the breast-bone was very deep, it is stated that its flight is neither long nor vigorous. In the present instance there is, as can be well seen in the skeleton on the table, a rudiment of a clavicle on each side close to the corocoid bone, and the depth of the keel of the sternum is very remarkable. The structure, too, in the keel shows an arrangement of the fibres and bone cells suitable for giving this appendage a great increase of strength, in a longitudinal direction, somewhat analogous to the form of Fairbairn's lifting crane; the sternal muscles were of very great size and weight, and, being placed so far back abdominally, the direction of their action would be upwards greatly and backwards, and would give the bird a power of upward flight, which its long tail would well direct; while by the muscles of flight having their origin from the most moveable parts of the ribs and sternum, its flight would be expected to present a series of curves, like some of our smaller birds, to allow of the movements of respiration. Now,

the flight of this Parroquet corresponds very much with these inferences. It is a ground species, indulging in short flights, and whose flights form a curve much crenated. These flights, too, do not appear at all in proportion either in length or vigour to the depth of the keel of the sternum. This bird is common about Adelaide, and goes by the name of the Rose-hill Parroquet."

After which was read the following paper:—

OCCASIONAL NOTES ON THE OCCURRENCE OF RARE BIRDS IN THE VICINITY OF THE SHORES OF THE RIVER MOY AND KILLALA BAY. No. V.—ON THE OCCURRENCE OF THE SPOTTED REDSHANK AND WILD SWAN. By R. WARREN, JUN., Corresponding Member.

I HAVE much pleasure in bringing under the notice of the meeting the occurrence in this locality of that rare bird, the Spotted Redshank (*Totanus fuscus*), a fine specimen of which I obtained quite unexpectedly on the 14th of January last. I was returning from snipe shooting in a small marsh at Killanly, near the River Moy, when I observed, about fifty yards distant, what I thought was a common Redshank, feeding on a little mudbank left bare by the receding tide. The evening was becoming very dark, and as I wished to discharge my gun, before returning home, in preparation for cleaning it, I took a chance shot at the bird and fortunately knocked it over; my dog fetched it in, and on taking it from her I merely remarked that it differed from the common redshank in the greater length and delicacy of the bill and legs, there not being sufficient light to perceive any difference of plumage. I thought it only a variety of the common redshank, and put it in my bag along with the other birds I had shot. However, next morning on looking over the produce of my day's shooting, I immediately recognised it as the spotted redshank. On measuring it I found its dimensions to be as follows:—Total length from bill to tail, $12\frac{3}{8}$ inches; length of bill from rictus $2\frac{1}{2}$ inches; length of bill from forehead, $2\frac{1}{4}$ inches; length of tarsus, $2\frac{1}{2}$ inches; length of middle toe and nail, nearly $1\frac{1}{2}$ inches; length of bare part of thigh, $1\frac{1}{4}$ inches; length of carpus, $6\frac{1}{4}$ inches. The legs were of the same pale orange colour as those of the common redshank, and even paler than those of one I shot for comparison, and not of the bright red colour mentioned in some authors' descriptions. As far as I have been able to ascertain, this bird is, I believe, only the second specimen taken in Ireland, there not being an Irish killed specimen in any of the collections with which I am acquainted, and the only authentic record of the capture of the spotted redshank in Ireland, that I know of, is that given by William Thompson in the second vol., page 200, of his "Birds of Ireland." He there mentions having shot a specimen of the spotted redshank in Belfast Bay, on the borders of Holywood rabbit-warren, on the 22nd of August, 1823, but the bird was unfortunately lost as a specimen, having been

cooked by mistake, and served up at table with a curlew and other vulgar denizens of the shore.

The visits of the spotted redshank to our shores may not be of such rare occurrence as is generally supposed, as from its similarity to the common redshank it may possibly be overlooked; for, unless seen on the wing together, the two species are not easily distinguished from each other; but whenever seen on the wing, the total absence of the broad white band, which is so conspicuous on the secondaries of the wing of the common redshank when in flight, will always serve as an unerring mark to distinguish the species.

During the severe frost in January I was told that a Wild Swan was observed for some days to frequent the river near Belleek, but I did not meet it until the 18th, when I saw it flying towards the Moyview shore, and alighting in the river where it was clear of ice, about one hundred yards from where I was standing. It evidently wished to come ashore, but could not pass the immense sheets of ice that lay along the shore. It then swam down the river looking for some opening in the ice to get to shallow water to feed. In consequence of the thick fog at the time I was unable to keep it within sight, although I was very anxious to get a shot at it. I could not be certain of its species, but am inclined to consider it *Bewickii*, for this reason, that when it pitched on the water it swam about with its neck stretched out, uttering low calls, something like the words *hong, haw*, in a low, sweet tone. Yarrell says the call of the *Cygnus Bewickii* is similar to the words *hong, haw, haw*, long drawn out; so it is very probable that the bird in question was of this species.

A paper was then read entitled:—

ON NEW FORMS OF DIATOMACEÆ, FROM DREDGINGS OFF THE ARRAN ISLANDS, COUNTY GALWAY. Second Series. By THE REV. EUGENE O' MEARA, A.M.

IN my first communication on this subject I ventured to express my opinion, that a more careful examination of the material would lead to the discovery of other new and interesting forms; and I have now the gratification to inform you that my anticipations have been fully verified. I have been engaged from time to time, as opportunity was afforded, in examining the material with most satisfactory results. Some few of the forms recently discovered I shall submit to your notice.

Coscinodiscus fasciculatus.—Fig. 1. $\times 600$. N. sp., O'M. Diameter .0033.; valve areolate; the areolæ in parallel fasciuli about sixteen in number; each fasciculus contains nine parallel moniliform lines; the central lines reach from the centre to the circumference; the next lines on either side of the same length, each successive pair terminating at a greater distance from the centre.

This form is exceedingly rare; only one specimen has as yet come under my notice—and this an imperfect one—but still sufficient to indicate the characteristics; it is, therefore, not without some misgivings I venture to notice it, although the marked peculiarities of it, as I consider, justify me in doing so.

In respect of the fasciculate arrangement of the areolæ, there is a great similarity between this species and *Cos. symmetricus*, and *Cos. Normanni*. The areolæ, however, are smaller than in the former, and larger than in the latter.

Eupodiscus eccentricus.—Fig. 2, $\times 800$, N. sp., O'M. Diameter about $\cdot 0014$; surface of the valves distinctly areolate; the areolæ, which are larger towards the centre than towards the circumference, are arranged eccentrically; there is a marginal blank space, in which the processes, about twenty in number, are placed at equal distances.

Stauroneis rhombica.—Fig. 3, $\times 600$, N. sp., O'M. Length of valve, $\cdot 0017$; greatest breadth, $\cdot 0012$; rhomboido-elliptical, with narrow lanceolate apices; striæ very fine, punctate, and parallel; staurons narrow; the transverse limb of uniform breadth, and equal in length to half the breadth of the valve.

Stauroneis costata.—Fig. 4, $\times 600$, N. sp., O'M. Length of valve, $\cdot 0021$; breadth, $\cdot 0009$; narrow-elliptical, rounded at the ends; striæ distinctly costate, and gently waved; the transverse limb of the staurons short, and of equal breadth throughout.

Cocconeis clavigera.—Fig. 5, $\times 600$, N. sp., O'M. Valve broadly elliptical; length, $\cdot 0014$; breadth, $\cdot 0011$; striæ costate; the costæ radiate, club-shaped, and very fine at the median line, and gradually expanding towards the margin; not reaching the margin.

Cocconeis Wrightii.—Fig. 6, $\times 800$, N. sp., O'M. Valve broadly elliptical; length, $\cdot 0017$; breadth, $\cdot 0012$; a narrow border is closely studded with slightly elongated cellules; the central nodule is expanded in the form of two crescents, touching at their convex centre, and radiating towards the apices; striæ moniliform, arranged in curves, nearly parallel with the limbs of the crescent-like expansions of the central nodule.

Cocconeis Portei.—Fig. 7. $\times 800$; N. sp., O'M. Valve very minute; length, $\cdot 0009$; breadth, $\cdot 0007$; broadly elliptical, with a narrow border; striæ radiate, punctate; the puncta very minute at the median line, and gradually enlarging towards the outer margin; the median line broad.

Rhaphoneis liburnica, var.—Fig. 8, $\times 600$. Valve broadly elliptical; length, $\cdot 0018$; breadth, $\cdot 0014$; striæ radiate; the cellules, which are not more than six in the longest stria, appear slightly projected above the surface of the valve, are quadrangular at the base, narrower and rounded towards the top; rhaps narrow, elliptical; valve without border, margin striated. At first I was disposed to regard this form as a distinct species, but, on consideration, preferred to refer it to *Rhaphoneis liburnica*, Grunow.

The specific description of *R. liburnica* given by that author agrees

with the general characters of this form; but the hispid appearance of the cellules, and their quadrangular figure at the base, entitle it to be regarded as a variety.

Rhaphoneis suborbicularis.—Fig. 9, $\times 600$; N. sp., O'M. Valves nearly orbicular; length, $\cdot 0022$; breadth $\cdot 0019$; divided into compartments by short costæ—eight on one side, nine on the other, alternately disposed; the spaces between the costæ filled up by three lines of puncta, the two outer lines receiving the central vacant space or rhapshe; the intermediate line much shorter. This species, in its general characters, very much resembles a form figured by Grunow, and with hesitation regarded by him as a variety of *Cocconeis Grevillii*.

The absence of a central line and central nodule, as well as the presence of a distinct rhapshe, mark the present form as belonging to the genus *Rhaphoneis*. The form figured by Grunow is narrow-elliptical; mine is nearly orbicular. These differences notwithstanding, I am disposed to think that Grunow's forms and mine are, at best, but varieties of the same species.

Rhaphoneis Jonesii.—Fig. 10, $\times 600$; N. sp., O'M. Valve broadly elliptical; length, $\cdot 0018$; breadth, $\cdot 0014$; striæ radiate, moniliform, cellular, close, compressed, very large at the margin, and gradually decreasing in size towards the rhapshe, which is narrow and elliptical.

Rhaphoneis Moorei.—Fig. 11, $\times 600$; N. sp., O'M. Valve broadly elliptical; length, $\cdot 0016$; breadth, $\cdot 0011$; striæ radiate, moniliform; cellules of the same size throughout; rhapshe narrow. At first inspection of the figures it might appear that this form is identical with the preceding; but, on consideration, the differences are so great as to warrant me in regarding them as distinct species.

The rhapshe in the former, though narrow, is wider than in the present; the former has a distinct border, this has none; but the most marked difference is to be found in the character of the striæ. In the case of *R. Moorei* the cellules which form the striæ are all of nearly the same size, round and distant; whereas, in the case of *R. Jonesii*, the cellules are so close as to give a costate appearance to the striæ; they are also flattened, and decrease in size from the margin towards the rhapshe.

Rhaphoneis Archeri.—Fig. 12, $\times 600$; N. sp., O'M. Valve elliptical; striæ slightly radiate, distinctly costate, distant; rhapshe lanceolate. A form described by Grunow, and by him called *Rhaphoneis scutelloides*, so far as the figure is concerned, so closely resembles the present, that at first I was disposed to regard mine as identical with it, but from the description there is no doubt it is distinct. The striæ of *R. scutelloides* are described by Grunow as "indistincté punctatis;" in *R. Archeri* they are distinctly costate.

Mr. John Good exhibited some barnacles found attached to a fragment of timber in the channel. He was disposed to regard them as of foreign origin, and that they had propagated there during the time he

supposed the wood had been submerged, estimated at over twenty years.

Dr. Arthur Wynne Foot exhibited two species of grosbeak, living, one *Coccothraustes vulgaris*, the other *Cardinalis virginicus*, or Virginian nightingale.

The meeting then adjourned.

THURSDAY EVENING, JUNE 27, 1867.

JOHN GOOD, Esq., in the Chair.

The Minutes of the preceding meeting having been read and signed, the following paper was then read :—

NOTE OF SOME SPECIES OF MOSSES NEW TO THE IRISH FLORA. BY DAVID MOORE, Ph. D., F. L. S., M. R. I. A., &c.

FOR the purpose of collecting some plants for the Botanic Gardens, and for Continental correspondents, I was enabled to visit some parts of the counties of Antrim and Donegal during the autumn of last year, 1866. Among the mosses collected on that occasion, a few of them have not hitherto been recorded as Irish species. It therefore affords me additional pleasure to be able to continue further contributions in that department of our Flora.

The first I shall notice is *Tortula Mülleri*, Bryol. Eur. (Müller's Screw Moss.)

Habitat—On basaltic rocks facing the north, about a mile from Glenarm, on the way to Larne, September, 1866.—This fine species grew in some quantity where it was found, but the fruit, which is produced in spring, had withered up a good deal. The Synoicous inflorescence was, however, sufficient to distinguish it from *Tortula laevipila*, the only other British species for which it is likely to be taken.

Mnium affine, Bland (Many-fruited Thyme Thread Moss).

Habitat—On the sandy rabbit warren near Dunfanaghy, county Donegal, September, 1866. The male plants grow on the sandy warrens near the little village of Dunfanaghy in great abundance, but I could not find any fruit, either fresh or withered, after making a long search for it. If the female plants occur in that locality, there are only very few of them.

Cylindrothecium concinnum, De Notaris (Braided Cylinder Moss).

Habitat—On limestone rocks, and also on sandy ground, near Dunfanaghy, September, 1866. This fine species was found growing sparingly among other mosses, and was not distinguished by me as the plant; but on sending another species to Mr. Wilson for his opinion, he recognised the *Cylindrothecium* mixed with it, which led to its discovery. No fruit was found, only the male plant.

In connection with these additions, I may mention that Mr. Isaac Carroll, of Cork, sent me fine specimens in fruit of *Hypnum illecebrum* (Linn.), which he gathered last year near Passage, county Cork. This is a very little-known moss in Ireland, and its discovery in so perfect a state is worthy of being recorded.

Campylopus Schwarzii, Schimper (Schwarz's Moss), was also observed in considerable abundance on Muckish Mountain, county of Donegal, by me last September. It had not been found previously in the North of Ireland.

After which was read the following paper—

ON THE STINGING PROPERTIES OF THE PHYSALIA, OR PORTUGUESE MAN-OF-WAR. By ARTHUR WYNNE FOOT, M.D.

IN the summer of 1864 I had an opportunity of observing the urticating powers of the Physalia, or Portuguese Man-of-War, under the following circumstances:—From on board a large schooner yacht, which was drifting with the tide in a dead calm, about fifteen miles west of Cape Ortegal, a Physalia was observed at a little distance, with its bladder, pneumatocyst, fully distended, and shining like an immense opal; the bladder was surmounted by a beautiful purple corrugated crest, and one end of it was shaped like the beak of a bird. With the view of capturing it for examination, the dingy was lowered, with two hands in it, and sent in pursuit. As the yacht was drifting faster than the Physalia, the latter was some distance astern by the time the boat had been lowered and pulled up to it; the animal did not collapse on the approach of the boat; it was seized, and hastily deposited in the bottom of the boat. As the dingy was pulling up to overtake the yacht, I observed the man who had caught the animal, and who was one of the most able of the crew, to be alternately wringing his hands and washing them over the side of the boat: when they got on board he went forward at once, not waiting to lift his prize out of the dingy. Going forward to the fore-part of the vessel to see what had happened, I found him lying on the deck, writhing with pain, and with tears in his eyes; the right hand was already swollen, and the back of the hand and wrist red, as if taken out of scalding water; both hands had still a great deal of the mucus, with which the Physalia covers those who handle it, adherent to them; the right one was the most hurt, being the one which had most come in contact with the animal; the hands were washed with hartshorn and fresh water to remove the mucus, and wrapt up in rags steeped in laudanum and water, while a liberal allowance of brandy was served out as an internal remedy. When asked what the pain in his hands was like, he said they were "burning as if in a fire." In fifteen minutes after he came on board pain was shooting up along the arms into each armpit, and he had a lightness, "like an ache," across his chest. He could not keep the cloths on his arms, preferring to dip the hands in a bucket of seawater to anything else. In less than half an hour after he had been stung, a papular rash came out on the front of his right wrist and forearm, extending nearly to the elbow, of a pinkish colour, slightly elevated. A thermometer placed at this time between the swollen fingers of the right hand stood at 93°, while one in a similar position, in the less injured hand, marked 89°; the comparative lowness was due to the hand being just taken out of

the bucket of salt water, but it shows the relative difference of temperature, which was very perceptible when the parts were touched. The pain began to get less in about an hour, ceasing first in the chest and shoulders; his pulse did not exceed 76 at any time. The men had various experiences to relate in reference to the effects of meddling with Portuguese Men-of-War. The captain predicted confidently that the pain would cease entirely at sunset; the mate said it would last three hours, because he had once kicked one of "them stingers" with his bare foot as it lay stranded on the sea shore, and the pain had lasted that length of time. The captain's prediction was nearer the truth, as the man was stung at 6 P.M., and by sunset, which was about 7.40, the pain was very much less; but he had a bad headache, and was quite unable to make any use of his hand. Next morning the rash had disappeared; the hand was swollen, and could not be closed; the fingers were "numb," and upon testing the sensibility of the skin, I found that it was really absent; he could not haul a rope properly with the right hand for a couple of days. On going to look at the animal, which had done all this mischief, about half an hour after it had been caught, I found the *Physalia* with the bladder still distended, though shrivelled and quivering; the beautiful colours, which it had shown when afloat, were dimmed and disappearing, and the long fringed tails were sticking to the bottom of the boat, as was a quantity of mucus which they had discharged; it was difficult to get the air out of the bladder, even when stabbed with a knife. The men very willingly heaved it overboard, and mopped out the boat well, correctly believing that the mucous secretion from the animal long retained its stinging properties.

Dr. George Bennett has described the effects of the sting of a *Physalia* upon himself, and they are so similar to those which I witnessed, that I prefer to quote his observations at length than to abridge it.* "On one occasion," he says, "I tried the experiment of its stinging powers upon myself intentionally, when, on seizing it by the bladder portion, it raised the long cables by muscular contraction of the bands situated at the base of the feelers, and, entwining the slender appendages about my hand and fingers, inflicted severe and peculiarly pungent pain, adhering most tenaciously at the same time, so as to be extremely difficult of removal. The stinging continued during the whole time that the minutest portion of the tentacula remained adherent to the skin. I soon found that the effects were not merely confined to the acute pungency inflicted, but produced a great degree of constitutional irritation; the pain extended upwards along the arm, increasing not only in extent but in severity, apparently acting along the course of the absorbents, and could only be compared to a severe rheumatic attack; the pulse was accelerated, and a feverish state of the whole system was produced; the muscles of the chest even were affected, the same dis-

* "Gatherings of a Naturalist in Australasia," p. 7.

trussing pain being felt on taking a full respiration as obtains in a case of acute rheumatism. The secondary effects were very severe, continuing for nearly three quarters of an hour; the duration of the pain being probably longer in consequence of the time and delay occasioned by removing the exciting and virulent tentacula from the skin, as they adhered to it, by the aid of the stinging capsules, with an annoying degree of tenacity. On the whole being removed, the pain began gradually to abate; but during the day a peculiar numbness was felt, accompanied also by an increased temperature in the limb upon which the stings had been inflicted. For some hours afterwards the skin displayed several white elevations, or wheals, on the parts stung, similar to those usually seen resulting from the poison of the stinging nettle. To remove the irritation, at first cold water was applied; but this, instead of alleviating, increased the evil; an application of vinegar relieved the unpleasant symptoms, and olive oil has produced a similar beneficial effect." Dr. Bennett observed that the irritative power is retained for some weeks after the death of the animal in the vesicles of the cables; and even linen cloth, which had been used for wiping off the adhering tentacula, when touched, still retained the pungency, although it had lost the power of producing such violent constitutional irritation.

Sir Hans Sloane (remarkable for having been the first medical practitioner advanced to the dignity of a baronetcy) has given a quaint account of his observations upon the Physalia in his large work, entitled "A Voyage to Jamaica," published in 1707. Sir Hans sailed to the West Indies in September of 1687, in the character of Physician to the Duke of Albemarle, who had been appointed Governor of Jamaica, and in his diary states, that when in forty-six degrees of northern latitude, he first saw what the seamen call a Caravel, or Portuguese Man-of-War; "They burn," he says, "more violently than the species of the North Sea," alluding, no doubt, to the stinging Medusæ of colder waters, several kinds of which are common in the Irish Channel, "and they do suck themselves so close to the skin that they do raise blisters, and cause sometimes St. Anthony's fire."

There are several species of this Acaleph, though not yet well distinguished from each other, found in the waters of the Mediterranean and Atlantic. The term Physalia (from *φυσάλις*, a bladder) was first employed by Lamarck; and the following account of its structure is taken from Eschscholtz:—"The very large swimming bladder is distended with air, in such a manner that its longest diameter is horizontal. In all the species there may be remarked at one end of the bladder a prolongation, also full of air, which is not provided with suckers, or prehensile filaments. In some species this part equals half the entire length of the bladder, while in others it is very short. The opposite end of the bladder, on the other hand, is, in all species, covered on one side with suckers, which, in young individuals, are much more imperfect than the others, which lie in the middle of the vesicle. Along the upper surface of the bladder there runs a plaited ridge,

which, in its common condition, is also filled with air; but the animal can, at will, press the air out of it, when the ridge collapses into a membranous fold, the bladder remaining distended. On the lower side of the bladder are the organs of nutrition, which consist of suckers and prehensile filaments; the former arise either singly from the bladder, or many spring together from a common stem; the prehensile filaments consist of rounded filaments, covered throughout their whole length on one side with a series of reniform acetabula, and on the other side supported by a narrow membrane, which accompanies them from the root to the point. At the root of each prehensile filament, of which there are many of different sizes on a single animal, is a long pointed receptacle of fluid, attracted throughout almost its whole length to the filaments, and only free at its apex. The acetabula of the prehensile filaments appear to be the organs which secrete the mucus which produces the irritation of the human skin, and by which animals which are seized are at once paralyzed."

One opinion as to the cause the of pain inflicted by these *Acalephæ* is, that the mucus from the tentacles, which is undoubtedly the vehicle of the irritation they cause, is possessed of some poisonous property; another, and the more received is, that the irritation is mechanical, due to the rupture of numerous *cnidæ*, or thread-cells, which cells, when ruptured, set free numerous fine barbed filaments, capable of penetrating the pores of the skin.

The *cnidæ*, or thread-cells, are ruptured under pressure or irritation, and the barbed filament or thread contained in the cell is brought in contact with the offender. These thread-cells are found unusually large in the *Physalia*, where they are spherical in figure, and attain a diameter of .003 of an inch.*

There are, moreover, reasons other than anatomical, for regarding the irritation of the skin from contact with these threads to be of a mechanical rather than of a poisonous or chemical nature. It has been shown by Kletzinsky that levigated asbestos rubbed upon the skin causes a rash, analogous to that produced by a nettle-sting, which is closely similar to that produced by the marine *Acalephæ*; and in the case of the nettle-sting, it has not been proved that the irritation is due to the assumed presence of formic acid in the leaves of this plant, while many think it more likely to be owing to the number of fine hairs from the leaf which enter the skin. Many setaceous larvæ, if handled, inflict severe so-called stings, followed by a rash and great irritation; the larvæ of the admiral butterfly, of the nettle tortoise-shell butterfly, of the gold-tailed moth, and of the procession-moth, have, in many instances, produced severe irritation of the skin, similar to that resulting from the hairs of the pods of *Dolichos pruriens*. In the case of some larvæ, as *Papilio urtica*, this stinging power has been illogically attributed to their feeding upon the leaves of nettles. Other

* "Manual of Cœlenterata," Greene.

marine productions, besides the hydrostatic Acalephæ, have urticating properties; Darwin mentions,* that he was a good deal surprised by finding two species of coral of the genus *Millepora* (*M. complanata* and *alcicornis*) possessed of the power of stinging; the stinging property seemed to vary in different specimens; when a piece was pressed or rubbed on the tender skin of the face or arm, a pricking sensation was usually caused, which came on after the interval of a second, and lasted for a few minutes; little red spots were produced on the tender skin of the arm, which appeared as if they would have formed watery pustules, but did not; the *Aphysia*, or sea-slug of the Cape de Verd Islands, a flexible coralline, allied to *Sertularia*, and in the East Indian Sea a species of sea weed, are said to be endowed with this power of stinging.

In connexion with this subject, I may be allowed to allude to the stinging power of some of the Medusæ of the Irish Sea. I have been stung myself by one of the species of *Cyanæa*, and had one leg and side covered with the nettle-rash, which generally results from contact with their long filamentary tentacles. The animal passed in front of me while swimming. It was moving horizontally through the water by the alternate contraction and dilatation of its umbrella-like disk, trailing its long appendages after it; not knowing its powers at the time, I swam across its path, dragging it up close to my side by doing so; though aware at once that it had stung me, the sensation was not in any degree painful until after I had come out of the water. The delicate skins of children, or tender parts, such as the mouth or eyes, suffer very much from contact with the stinging Medusæ of our seas. Dr. Tyrrell has published the case of a fisherman who lost the fore-finger of his right hand from mortification, consequent upon the sting of a Medusa. This man, in clearing out a net, took a Medusa from it, when he found a sudden stinging sensation run up his finger, which had been slightly wounded before. The pain gradually subsided, and he took no more notice of the matter for two days, when swelling and pain in the finger came on suddenly; in seven days after the receipt of the sting the whole finger was gangrenous, and had to be amputated in consequence.† The stinging Medusæ of our seas belong to the section of the Acalephæ, termed by Eschscholtz *Discophoræ*, from the shape of the upper portion of their bodies, which forms a hemispherical disk, and but two genera—*Aurelia* and *Cyanæa*—are endowed with this property in a marked degree. By those who, from a residence at the seaside, have had opportunities of observing the stinging effects, in autumn, of the *Aurelia aurita* and *Cyanæa capillata*, the application of an alkaline and stimulating lotion has been recommended: for example, a drachm of bicarbonate of potash, a drachm of sesquicarbonate of ammonia, dissolved in half an ounce of spirits of hartshorn, and six ounces of camphor mixture.‡

* "Naturalist's Voyage round the World," p. 464.

† "Dub. Quart. Jour. Med. Sci.," Aug., 1864, p. 210.

‡ "Brit. Med. Jour.," Jan. 5, 1861, p. 7.

A paper was read by Mr. W. Archer, entitled "Some desultory Remarks on certain Freshwater Rhizopoda, with descriptions of some new species, three of which form types of as many new genera in the Radiolaria."

The foregoing paper will appear hereafter in the Society's Journal. Mr. Archer is obliged to defer its publication until he is able to obtain recent specimens of one or two of the rarer Rhizopods, but comparatively seldom encountered, in order to endeavour to supply from these desiderata certain deficiencies in the figures intended to illustrate the forms referred to in this lowly but very interesting animal group.

Dr. Alexander Dickson, Professor of Botany, T.C.D., was elected an Ordinary Member of the Society.

The Society adjourned for the recess until November.

No. VI.

SOCIETIES AND INSTITUTIONS ENTITLED TO RECEIVE THE PROCEEDINGS OF THE NATURAL HISTORY SOCIETY OF DUBLIN.

The Societies are arranged in a single list, in the alphabetical order of the places in which they are established:—

ALNWICK, . . .	The Berwickshire Naturalists' Club.
ALTENBURG, . . .	Die naturforschende Gesellschaft.
AMSTERDAM, . . .	De Koninklijke Akademie van Wetenschappen.
„ . . .	Het Koninklijk Zöologisch Genootschap.
ANGERS, . . .	La Société Linnéene du Département de Maine-et-Loire.
AUGSBURG, . . .	Der naturhistorische Verein in Augsburg.
BAMBERG, . . .	Der naturhistorische Verein in Bamberg.
BASEL, . . .	Die naturforschende Gesellschaft.
BERLIN, . . .	Die königliche Akademie der Wissenschaften.
„ . . .	Der botanische Verein für die Provinz Brandenburg.
BERN, . . .	Die Schweizerische Gesellschaft für die gesammten Naturwissenschaften.
„ . . .	Die naturforschende Gesellschaft.
BOMBAY, . . .	The Royal Asiatic Society.
BONN, . . .	Der naturhistorische Verein der Preussischen Rheinlande und Westphalens.
BONN and BRES- LAU, . . .	{ Die kaiserliche Leopoldinisch-Carolinische Akademie der Naturfor- scher zu Bonn und Breslau.
BOURDEAUX, . . .	La Société Linnéenne de Bourdeaux.
BOSTON, . . .	The Boston Society of Natural History.
BREMEN, . . .	Der naturwissenschaftliche Verein.
BRESLAU, . . .	Die Schlesische Gesellschaft für vaterländische Cultur.
„ . . .	Der Akademische naturwissenschaftliche Verein zu Breslau.
BRUGES, . . .	La Société des Sciences naturelles de Bruges.
BRÜNN, . . .	Der naturforschende Verein.
BRUXELLES, . . .	L'Academie Royale des Sciences de Bruxelles.
CAEN, . . .	La Société Linnéenne de Normandie.
CALCUTTA, . . .	The Asiatic Society of Bengal.
CARLSRUHE, . . .	Der naturwissenschaftliche Verein.
CHAMBERY, . . .	La Société Academique de Savoie.
CHARLESTON, . . .	The Elliott Society of Natural History.
CHERBOURG, . . .	La Société Impériale des Sciences naturelles.
CHICAGO, . . .	The Academy of Sciences.
CHRISTIANA, . . .	Videnskabs Selskabet.
CHUR, . . .	Die naturforschende Gesellschaft Graubündens.
COLMAR, . . .	La Société d'Histoire naturelle de Colmar.
COPENHAGEN, . . .	Det Kongelige danske Videnskabernes Selskab, Kjöbenhavn.
DANZIG, . . .	Die naturforschende Gesellschaft.
DORPAT, . . .	Die Naturforscher-Gesellschaft.
DRESDEN, . . .	Die Gesellschaft für Natur- und Heilkunde.
„ . . .	Die naturwissenschaftliche Gesellschaft "Isis."
DUBLIN, . . .	The Royal Irish Academy.
„ . . .	The Royal Dublin Society.
„ . . .	The Royal Geological Society of Ireland.
EDINBURGH, . . .	The Botanical Society of Edinburgh.
„ . . .	The Royal Society of Edinburgh.
ELBERFELD, . . .	Der naturwissenschaftliche Verein von Elberfeld und Barmen.

FRANKFURT-AM-MAIN,	}	Die Senckenbergische naturforschende Gesellschaft.
"		Der mikroskopische Verein.
FREIBURG,		Die naturforschende Gesellschaft zu Freiburg im Breisgau.
GENEVE,		La Société de Physique et d'Histoire naturelle.
"		L'Institut National Genevois.
GIESSEN,		Die Oberhessische Gesellschaft für Natur- und Heilkunde.
GLASGOW,		The Natural History Society.
GÖRLITZ,		Die naturforschende Gesellschaft zu Görlitz.
GÖTTINGEN,		Die königliche Gesellschaft der Wissenschaften.
GRAZ,		Der naturforschende Verein für Steiermark, Graz.
HAARLEM,		De Hollandsche Maatschapij der Wetenschappn te Haarlem.
HALLE,		Die naturforschende Gesellschaft zu Halle.
"		Der naturwissenschaftliche Verein für Sachsen und Thüringen in Halle.
HAMBURG,		Der naturwissenschaftliche Verein in Hamburg.
HANAU,		Die Wetterauische Gesellschaft für die gesammte Naturkunde.
HANOVER,		Die naturhistorische Gesellschaft zu Hannover.
HEIDELBERG,		Der naturhistorisch-medicinische Verein.
HELSINGFORS,		Societas Scientiarum Fennica.
HERMANNSTADT,		Der Siebenbürgische Verein für Naturwissenschaften zu Hermannstadt.
HULL,		The Literary and Philosophical Society.
JENA,		Die kaiserliche Leopoldinsch-Carolinische deutsche Akademie der Naturforscher.
KIEL,		Der Verein jenseits der Elbe für Verbreitung naturwissenschaftlicher Kenntnisse.
KÖNIGSBERG,		Der Preussische botanische Verein.
"		Der Fauna-Verein.
LAUSANNE,		La Société Vaudoise des Sciences naturelles.
LAYBACH,		Der naturwissenschaftliche Verein.
LEEDS,		The Philosophical and Literary Society.
LEIPZIG,		Die königliche Sächsische Gesellschaft der Wissenschaften.
LIEGE,		La Société Royale des Sciences de Liège.
LIVERPOOL,		The Literary and Philosophical Society of Liverpool.
LONDON,		The Entomological Society of London.
"		The Linnean Society.
"		The Zoological Society.
LÜNEBURG,		Der naturwissenschaftliche Verein.
LUXEMBOURG,		La Société des Sciences naturelles du Grand-Duché de Luxembourg.
LYON,		La Société Linnéenne de Lyon.
MALVERN,		The Malvern Naturalists' Field Club.
MANCHESTER,		The Literary and Philosophical Society of Manchester.
MANNHEIM,		Der Verein für Naturkunde.
MARBURG,		Die Gesellschaft zur Beförderung der gesammten Naturwissenschaften.
MAURITIUS,		The Royal Society of Arts and Sciences.
MECKLENBURG,		Der Verein der Freunde der Naturgeschichte in Mecklenburg, Neu Brandenburg.
METZ,		La Société d'Histoire naturelle du Département de la Moselle.
MILAN,		Società Italiana di Scienze Naturali, Milano.
MONTREAL,		The Natural History Society of Montreal.
MOSCOW,		La Société Impériale des Naturalistes de Moscou.
MÜNICH,		Die königliche bayersche Akademie der Wissenschaft in München.

- NAPLES, . . . Societa Reale di Napoli—Accademia della Scienze fisiche e matematiche di Napoli.
- NEUCHATEL, . . La Société des Sciences naturelles de Neuchatel.
- NEUSTADT, . . . Der naturwissenschaftliche Verein der Bayerischen Pfalz.
- NEWCASTLE-ON-TYNE, . . . } The Tyneside Naturalists' Field Club.
- NEW ORLEANS, . . The Academy of Sciences.
- NEW YORK, . . . The Lyceum of Natural History.
- NÜRNBERG, . . . Die naturhistorische Gesellschaft.
- PALERMO, . . . Accademia di Scienze e Lettere di Palermo.
- PARIS, . . . L'Académie des Sciences.
- „ . . . L'Institut Impérial de France.
- „ . . . La Société Botanique de France.
- „ . . . La Société de Biologie.
- PEST, . . . Die königlich-ungarische Gesellschaft für Naturwissenschaften in Pest.
- PHILADELPHIA, . The Academy of Natural Sciences.
- PLYMOUTH, . . . The Plymouth Institution and Devon and Cornwall Natural History Society.
- PRAG, . . . Der naturhistorische Verein „Lotos.“
- PRESSBURG, . . Der Verein für Naturkunde.
- PRIVAS, . . . La Société des Sciences naturelles.
- REGENSBURG (Ratisbon), Der Zoologisch-mineralogische Verein in Regensburg.
- „ . . . Die k. bayerische botanische Gesellschaft zu Regensburg.
- RIGA, . . . Der naturforschende Verein.
- SHREWSBURY, . . The Shropshire and North Wales Natural History and Antiquarian Society.
- ST. FRANCISCO, . The Academy of Sciences.
- ST. GALL, . . . Die naturwissenschaftliche Gesellschaft.
- ST. LOUIS, . . . The Academy of Sciences.
- ST. PETERSBURG, L'Académie Impériale des Sciences de St. Petersburg.
- STOCKHOLM, . . . Kongl. Svenska Vetenskaps Akademien.
- STRASBOURG, . . La Société du Museum d'Histoire Naturelle de Strasbourg.
- STUTTGART, . . . Der Verein für vaterländische Naturkunde in Württemberg.
- TAUNTON, . . . The Somersetshire Archæological and Natural History Society.
- TORONTO, . . . Canadian Journal of Industry, Science, and Art.
- TURIN, . . . Real Accademia delle Scienze di Torino.
- UPSALA, . . . Kongl. Vetenskaps Societaten.
- VENICE, . . . Imper. Reg. Istituto Veneto di Scienze Lettere ed Arti.
- VIENNA, . . . Der k. k. zoologisch-botanische Verein in Wien.
- „ . . . Der Verein zur Verbreitung naturwissenschaftlicher Kenntnisse.
- „ . . . Die Kaiserliche Akademie der Wissenschaften in Wien.
- WASHINGTON, . The Smithsonian Institution.
- WIESBADEN, . . Der Verein für Naturkunde im Herzogthum Nassau.
- WÜRZBURG, . . . Die physicalisch-medicinische Gesellschaft in Würzburg.
- ZÜRICH, . . . Die Naturforschende Gesellschaft zu Zürich.
- „ . . . Die allgemeine schweizerische Gesellschaft für die gesammten Naturwissenschaften.

No. VII.

PUBLICATIONS OF SCIENTIFIC SOCIETIES RECEIVED.

(FROM NOVEMBER, 1866, TO NOVEMBER, 1867.) *

THE following Societies, arranged in the alphabetical order of the places in which they are established, have kindly sent their Publications for the acceptance of the Natural History Society of Dublin; and the safe receipt of same, as below specially detailed, is hereby, with best thanks, duly acknowledged:—

- ALNWICK, . . . Proceedings of the Berwickshire Naturalists' Club, 1866 [wants 1865].
 ALTENBURG, . . . Mittheilungen aus dem Osterlande; gemeinschaftlich herausgegeben vom Gewerbe-Vereine, von der naturforschenden Gesellschaft, dem bienenwirthschaftlichen Vereine zu Altenburg. Drittes und Viertes Heft, 1866.
- BASEL, . . . Verhandlungen der naturforschenden Gesellschaft in Basel, Band IV., Heft III. (1866).
 BONN, . . . Verhandlungen des naturhistorischen Vereines der preussischen Rheinlande und Westphalens, in Bonn. Dritte Folge; 3. Jahrgang 1. 2. Hälfte, nebst einer geologischen Uebersichtskarte der Rheinprovinz und der Provinz Westphalen, von H. V. Dechen.
 BRÜNN, . . . Verhandlungen des naturforschenden Vereines in Brünn; IV. Band, (1865).
 „ Desideraten-Verzeichniss des naturforschenden Vereines in Brünn, (1866).
- CALCUTTA, . . . Journal of the Asiatic Society of Bengal:—
 Part I., No. II., III., 1866.
 Part II., No. II., III., 1866.
 „ „ Special number (Ethnology), 1866.
- CHERBOURG, Mémoires de la Société Imperiale des Sciences naturelles de Cherbourg, Tome XI., 1865; Tome XII.. 1866.
- CHICAGO, . . . Proceedings of the Chicago Academy of Sciences, Vol. I., 1865.
- COPENHAGEN, Oversigt over det kongelige danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers Arbeider, 1865, No. 1, 2, 3, 4; 1866; No. 1-6, 1867, No. 1-3.
- DANZIG, . . . Schriften der naturforschenden Gesellschaft in Danzig. Neue Folge, Band I., Heft III., IV.
- DRESDEN, . . . Verhandlungen der Kaiserlichen Leopoldino-Carolinischen deutschen Akademie der Naturforscher (Acta Akademix C. L. C. G. naturæ curiosorum); Band XXXII.; Erste Abtheilung, 1865; Zweite Abtheilung, 1867.
 „ Sitzungsberichte der naturwissenschaftlichen Gesellschaft Isis zu Dresden; Jahrgang 1865 (No. 7-12); 1866 (No. 1-6, 7-9); 1867, No. 1-3).
 „ Schnee-Krystalle beobachtet in Dresden 1845-6; vom I. F. A. Franke.
 „ Verzeichniss der Mitglieder der Gesellschaft Isis im Mai 1866.
- DUBLIN, . . . Journal of the Royal Dublin Society, No. XXXIV., 1865; No. XXXV., 1866.
 „ Journal of the Royal Geological Society of Ireland, Vol. I., Part II., 1865-6.
- EDINBURGH, . . . Transactions of the Botanical Society of Edinburgh, Vol. VIII., Part III., 1866.

- FRANKFORT
ON
THE MAINE,
FREIBURG IM
BREISGAU, { Abhandlungen herausgegeben von der Senckenbergischen naturfor-
schenden Gesellschaft zu Frankfurt-am - Main, VI. Band, I, II,
Heft.
{ Berichte über die Verhandlungen der naturforschenden Gesellschaft zu
Freiburg im Breisgau, Band IV., Heft I., II.
- GENEVA, . . . Bulletin de l'Institut National Genevois. No. 22, 23, 1864; No. 29,
1866.
" Actes de la Société helvétique des Sciences naturelles, Genève, 1865.
- GIESSEN, . . . Bericht der oberhessischen Gesellschaft für Natur- und Heilkunde,
1854, 1867.
- GÖTTINGEN, . . . Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg-
Augustus-Universität in Göttingen, 1865, 1866.
- GRAZ, . . . Mittheilungen des naturwissenschaftlichen Vereines für Steiermark in
Graz. IV. Heft, 1867 [Heft III. fehlt].
- HAARLEM, . . . Archives néerlandaises des Sciences exactes et naturelles, publiées par
la Société Hollandaise des Sciences à Haarlem.
Tome I., 3, 4, 5, Livraison, 1866.
" II., 1, 2, " 1867.
- " Naturkundige Verhandlungen van de Hollandsche Maatschappij der
Wetenschappen te Haarlem, 1866.
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No. VIII.

LIST OF MEMBERS CORRECTED TO NOVEMBER, 1867.

Corrections of Errors or Omissions will be thankfully received by the Secretaries.

HONORARY MEMBERS.

Elected.

1863. 1. Agassiz, D. L., F. R. S., F. L. S., *Cambridge, U. S.*
 1858. 2. Bate, Charles Spence, F. R. S., F. L. S., 8, *Mulgrave-place, Plymouth.*
 1854. 3. Bell, Thomas, F. R. S., F. L. S., F. G. S., *Selborne, Hants.*
 1845. 4. Berkeley, Rev. Miles Joseph, M. A., F. L. S., *King's Cliff, Wandesford.*
 1863. 5. Carus, J. Victor, M. D., &c. *Leipzig.*
 1860. 6. de Brébisson, Alphonse, *Falaise, France.*
 1853. 7. Gray, John Edward, Ph. D., F. R. S., F. L. S., F. G. S., *British Museum.*
 1863. 8. Gray, Asa, M. D., *Cambridge, U. S.*
 1846. 9. Hincks, Rev. Dr., *Belfast.*
 1863. 10. Huxley, T., M. D., F. R. S., F. L. S., F. G. S., &c., 26, *Abbey-place, St. John's Wood*; and 28, *Jermyn-street, London.*
 1863. 11. Hyrtl, Joseph, M. D., Professor of Anatomy, *University of Vienna.*
 1841. 12. Jones, Thomas Rymer, F. R. S., 18, *St. Leonard's-terrace, Bloomfield-road, London.*
 1863. 13. Leidy, Joseph, M. D., *Philadelphia.*
 1863. 14. M'Coy, Frederick, F. G. S., *University of Melbourne.*
 1851. 15. Munroe, Colonel W., F. L. S., *39th Regiment.*
 1854. 16. Newman, Edward, F. L. S., 9, *Devonshire-street, Bishopsgate, London.*
 1854. 17. O'Kelly, M. J., *Rochestown House, Killiney.*
 1863. 18. Owen, Richard, D. C. L., LL. D., F. R. S., F. L. S., F. G. S., &c., *British Museum, London.*
 1859. 19. Patterson, Robert, M. R. I. A., *Belfast.*
 1841. 20. Boyle, Forbes, *King's College, London.*
 1854. 21. Sabine, Major-General Edward, R. A., D. C. L., LL. D., F. R. S., F. L. S., 13, *Ashley-place, Victoria-street, Westminster.*
 1854. 22. Westwood, Joseph, F. L. S.

LIFE MEMBERS.

1838. 1. Andrews, William, M. R. I. A., F. R. G. S. I., 4, *Nassau-street*; and "The Hill," *Monkstown.*
 1857. 2. Archer, William, 21, *Upper Pembroke-street.*
 1863. 3. Ball, Robert, 47, *Wellington-place.*
 1857. 4. Barnewall, Richard.
 1849. 5. Borough, Sir Edward, Bart., 4, *Nassau-street*; 61, *Fitzwilliam-square, N.*; and *Glenavena, Howth.*
 1860. 6. Corbett, J. H., *Queen's College, Cork.*
 1858. 7. Crowe, Edward, *Brighton-terrace, Bray.*
 1855. 8. Haughton, Rev. Samuel, M. D., F. T. C. D., F. R. S., M. R. I. A., V. P. R. G. S. I., *Wellington-road.*
 1845. 9. Hemphill, Robert, 3, *Great Clarence-street.*
 1838. 10. Hill, Lord George, M. R. I. A., *Gweedore, Dunfanaghy.*
 1848. 11. Hone, Nathaniel, M. R. I. A., *St. Dolough's.*
 1854. 12. Maxwell, Robert Perceval, *Groomsport, Bangor, Co. Down.*
 1848. 13. Montgomery, Robert John, 57, *Leinster-road, Rathmines.*
 1863. 14. M'Clintock, Sir Leopold, R. N., LL. D.
 1840. 15. Pollock, George A., *Oatlands, Navan.*

Elected.

1863. 16. Powerscourt, Right Hon. Lord Viscount, *Powerscourt Castle, Enniskerry*.
 1840. 17. Raye, Henry R., *Greencastle, Buncrana*.
 1847. 18. Renny, Henry Lawes, R. E., M. R. I. A.
 1850. 19. Smith, George, 71, *Lower Baggot-street*.
 1863. 20. Smyly, Ph. C., M. D., L. K. Q. C. P., F. R. C. S. I., 8, *Merrion-square*.
 1839. 21. Townsend, R. W.
 1856. 22. Whitty, John Irvine, LL. D., D. C. L.
 1838. 23. Williams, Richard Palmer, M. R. I. A., F. R. G. S. I., 38, *Dame-street*.

ANNUAL MEMBERS.

1863. 1. Andrews, Arthur, 4, *New Brighton, Monkstown*.
 1867. 2. Andrews, George, *Williamstown Castle*.
 1863. 3. Andrews, Henry, *Hastings, Ovoca-avenue, Blackrock*.
 1861. 4. Armstrong, Andrew, *Claddagh-terrace, Bray*.
 1866. 5. Bain, John, A. L. S., *College Botanic Garden*.
 1859. 6. Bagot, Andrew H., 24, *Leinster-road, Rathmines*.
 1858. 7. Baily, W. Hellier, F. L. S., F. G. S., *Belville, 135, Rathgar-road*.
 1863. 8. Barker, John, M. D., F. R. C. S. I., M. R. I. A., F. R. G. S. I., 83, *Waterloo-road*.
 1843. 9. Barrington, John, *Glenvar, Merrion-avenue, Blackrock*.
 1854. 10. Barton, Henry Malkin, 5, *Foster-place*; and 21, *Upper Fitzwilliam-street*.
 1863. 11. Bennett, E. H., M. D., F. R. C. S. I., F. R. G. S. I., 2, *Upper Fitzwilliam-street*.
 1860. 12. Bewley, Thomas, *Rockville, Newtownpark-avenue, Blackrock*.
 1863. 13. Bradshaw, G. B., F. R. G. S. I., 20, *Hardwicke-street*.
 1851. 14. Brady, Francis William, Q. C., 22, *Upper Leeson-street*.
 1863. 15. Brady, Thomas F., *Percy-place*.
 1865. 16. Brooke, Sir Victor A., Bart., *Colebrook, Brookeborough*.
 1863. 17. Brownrigg, William Bookey, A. B., Ex Sci. Sch., T. C. D., F. R. G. S. I., 18, *Adelaide-road*; and *Moorhill, Brannoxtown*.
 1865. 18. Byron, Ryland, 2, *Fitzwilliam-place*.
 1840. 19. Callwell, Robert, M. R. I. A., F. R. G. S. I., 25, *Herbert-place*.
 1864. 20. Cane, Richard, 60, *Dawson-street*.
 1864. 21. Carte, Alexander, M. D., F. R. C. S. I., F. L. S., M. R. I. A., F. R. G. S. I., *Royal Dublin Society, Kildare-street*; and *Kilmainham*.
 1863. 22. Carte, William, L. R. C. S. I., *Royal Hospital, Kilmainham*.
 1864. 23. Clermont, Right Hon. Thomas, Baron, M. R. I. A., *Ravensdale Park, Newry*.
 1865. 24. Codd, Francis, J. P., 88, *Harcourt-street*.
 1866. 25. Collis, Maurice H., M. B., 29, *Lower Baggot-street*.
 1839. 26. Croker, C. P., M. D., F. K. Q. C. P., M. R. I. A., F. R. G. S. I., Fellow Bot. Soc. Edinburgh, 7, *Merrion-square*.
 1860. 27. Dawson, George, *Peacock Lodge, Balbriggan*.
 1865. 28. Dickson, Rev. Benjamin, D. D., F. T. C. D., M. R. I. A., 1, *Kildare-place*.
 1867. 29. Dickson, Professor Alexander, M. D., 38, *Trinity College*.
 1858. 30. Dixon, George, F. R. G. S. I., 12, *Burlington-road*.
 1854. 31. Domville, William Compton, J. P., D. L., *Thornhill, Bray*.
 1856. 32. Doyle, John B., F. R. G. S. I., *Ballycastle, Co. Antrim*.
 1863. 33. Dunlop, A. A., 95, *Upper Baggot-street*.
 1863. 34. Edgeworth, R. L., M. B., *Kildare-street Club*.
 1866. 35. Ferrar, Rev. William Hugh, F. T. C. D.
 1856. 36. Frazer, William, L. K. Q. C. P., L. R. C. S. I., 124, *Stephen's-green*.
 1862. 37. Foot, Arthur Wynne, M. B., L. R. C. S. I., L. K. Q. C. P., 21, *Lower Pembroke-street*.
 1865. 38. Garnett, William Stawell, *Williamstown, Kells*.
 1863. 39. Geoghegan, Thomas Grace, M. D., F. R. C. S. I., 4, *Upper Merrion-street*.

Elected.

1864. 40. Geoghegan, Thomas, 4, *Upper Merrion-street*.
 1865. 41. Good, John, F. R. G. S. I., 17, *Creighton-street*.
 1866. 42. Grainger, Rev. John, *University Club*.
 1844. 43. Griffith, Sir Richard, Bart., LL. D., M. R. I. A., F. G. S., F. R. G. S. I., 2, *Fitzwilliam-place, South*.
 1863. 44. Grimshaw, Thomas W., M. B., C. M., L. R. C. S. I., 13, *Molesworth-street*.
 1854. 45. Haughton, James, *Chelsea Lodge, Duncannon, Co. Wexford*.
 1867. 46. Hewitt, David B., M. D., 35, *York-street*.
 1856. 47. Hodges, William, *Bank of Ireland*.
 1867. 48. Hodgson, E. M.,
 1865. 49. Howard, Francis John, *Kenilworth-square, Rathgar*.
 1863. 50. Hudson, Alfred, M. D., 2, *Merrion-square, North*.
 1864. 51. Jacob, A. H., M. D., F. R. C. S. I., 23, *Ely-place*.
 1861. 52. Johnston, Maziere, 7, *Synnott-place*.
 1863. 53. Jones, Admiral Theobald, F. L. S., F. G. S., 18, *Harcourt-street*.
 1863. 54. Jukes, Joseph Beete, Director G. S. I., F. R. S., M. R. I. A., 72, *Upper Leeson-street*.
 1855. 55. Kift, Thomas, *Minnowbrook, Roundtown*.
 1863. 56. Kinahan, Edward H., 11, *Merrion-square, North*.
 1858. 57. Lalor, John Joseph, 2, *Longford-terrace, Salthill*.
 1863. 58. Law, Robert, M. D., Hon. F. K. Q. C. P., M. R. I. A., 25, *Upper Merrion-street*.
 1863. 59. Lee, Rev. William, D. D., Archdeacon of Dublin, 50, *Lower Leeson-street*.
 1865. 60. Mackey, Alderman J. W., J. P., *Clonsilla House, Clonsilla*.
 1859. 61. Mathews, Edward, 62, *Middle Abbey-street*.
 1859. 62. Maziere, William, 1, *Gardiner's-place*.
 1867. 63. Minchin, Humphry, M. D., 56, *Lower Dominick-street*.
 1865. 64. de Moleyns, Lieut.-Col., the Hon. Dayrolles Blakeney, *Burnham House, Dingle*.
 1862. 65. Montgomery, Thomas Alexander, *Howth*.
 1862. 66. Montgomery, Alexander John, *Howth*.
 1863. 67. Moore, David, Ph. D., F. L. S., M. R. I. A., Director *Royal Dublin Society's Botanic Garden, Glasnevin*.
 1864. 68. Moore, Robert H., F. R. C. S. I., 28, *Upper Merrion-street*.
 1863. 69. Morgan, John, M. D., F. R. C. S. I., 23, *Stephen's-green, North*.
 1861. 70. Mulvany, John S., 50, *Lower Sackville-street*.
 1863. 71. Macalister, Alexander, L. K. Q. C. P., L. R. C. S. I., 11, *Gardiner's-place*.
 1863. 72. M'Donnell, Robert, M. D., F. R. C. S. I., F. R. S., M. R. I. A. 14, *Lower Pembroke-street*.
 1859. 73. M'Dowel, Benjamin G., M. D., C. M., F. R. C. S. I., 29, *Gardiner's-place*.
 1853. 74. M'Dougall, William, M. R. I. A., *Drumlisk House, Carrickbrack, Howth*.
 1863. 75. Napier, Right Hon. Sir Joseph, Bart., M. R. I. A., 4, *Merrion-square, South*.
 1866. 76. Nolan, Edward, 1, *Palmerston Villas, Upper Rathmines*.
 1854. 77. Norton, Captain John, *Goldsmith-terrace, Bray*.
 1840. 78. Nugent, Daniel, 7, *Denmark-street*.
 1860. 79. O'Brien, Octavius, F. R. G. S. I., 23, *Kildare-street*.
 1848. 80. O'Mahony, Rev. Thaddeus, 28, *Trinity College*; and 87, *Waterloo-road*.
 1859. 81. Peacock, Peter Leslie, *Merrion-square*.
 1866. 82. Perrin, Richard, 97, *Upper Mount-street*.
 1858. 83. Porte, George, M. R. I. A., F. R. G. S. I., *Lansdowne Lodge, Beggarbush-road*.
 1858. 84. Reeves, Robert, 22, *Merrion-square*.
 1864. 85. Reeves, Robert Cary, *Knock, Co. Clare*.
 1867. 86. de Ricci, Herman R., M. D., *Upper Merrion-street*.
 1856. 87. Roberts, Robert, *Bank of Ireland*.
 1854. 88. Sanders, Gilbert, M. R. I. A., F. R. G. S. I., *Foster-place*; and "The Hill," *Monkstown*.

Elected.

1866. 89. Smith, Fergus, 71, *Lower Baggot-street*.
 1855. 90. Smith, Robert William, M. D., F. R. C. S. I., M. R. I. A., F. R. G. S. I., 63, *Eccles-street*.
 1866. 91. Smith, Walter, 121, *Lower Baggot-street*.
 1856. 92. Stephens, Henry Colclough, 8, *Pembroke-place*; and *Greenwood, Shankill*.
 1863. 93. Stokes, William, Jun., M. D., C. M., L. R. C. S. I., 5, *Merrion-square, North*.
 1856. 94. Sutherland, Alexander, 60, *Upper Sackville-street*.
 1840. 95. Todhunter, Joseph, 3, *College-green*.
 1866. 96. Tyner, G. St. G., M. D., *Steevens' Hospital*.
 1859. 97. Vickers, Henry Thomas, 81, *Lower Leeson-street*.
 1864. 98. Waller, George A., 5, *Brighton Vale, Monkstown*.
 1862. 99. Walpole, William White, *Windsor Lodge, Monkstown*.
 1855. 100. West, Very Rev. John, D. D., M. R. I. A., Dean of St. Patrick's, 6, *Wilton-place*.
 1863. 101. Whiteside, Right Hon. J., Chief Justice Queen's Bench, 2, *Mountjoy-square*.
 1866. 102. Williams, William, *Bachelor's-walk*.
 1866. 103. Wilson, G. Orr, A. M., *Dunardagh, Blackrock*.
 1866. 104. Wilson, Henry, F. R. C. S. I., 29, *Lower Baggot-street*.
 1862. 105. Wilson, Thomas, 79, *Waterloo-road*.
 1865. 106. Woodworth, Joseph H., 37, *Dame-street*.
 1854. 107. Wright, E. Perceval, M. D., F. R. C. S. I., F. L. & Z. S., M. R. I. A., Professor of Zoology Dublin University, 5, *Trinity College*; and 10, *Clare-street*.

ASSOCIATE MEMBER.

1865. 1. Gloyne, C., 5, *Haddington-terrace*.

CORRESPONDING MEMBERS.

[Those marked with an asterisk (*) have paid 5s. Subscription for the last year, and are thus entitled to receive a Copy of the current Part of the "Proceedings."]

1865. 1. Alexander, Surgeon, R. N., *Queenstown*.
 1863. 2. Allman, George J., M. D., F. R. C. S. I., F. R. S., M. R. I. A., Regius Professor of Natural History, *University of Edinburgh*.
 1863. 3. Allman, R. L., *Bandon, Co. Cork*.
 *1863. 4. Babington, Charles Cardale, M. A., F. R. S., F. L. S., F. G. S., Professor of Botany, *St. John's College, Cambridge*.
 1863. 5. Baikie, W. Balfour, M. D., *Haslar Hospital, Gosport*.
 *1861. 6. Blackett, Edward R., M. D., *Southwold, Wangford, Sussex*.
 1863. 7. Bowerbank, J. Scott, LL. D., F. R. S., F. L. S., F. G. S., *Highbury Grove, Islington, London*.
 1865. 8. Brady, G. F., F. R. C. S. E., *Strabane*.
 1863. 9. Browne, Captain Thomas, F. L. S., *Manchester*.
 1863. 10. Bryce, James, Jun., F. G. S., *Glasgow*.
 1863. 11. Burkitt, Robert J., M. D., 5, *Lady-lane, Waterford*.
 1851. 12. Carroll, Isaac, *Cork*.
 1855. 13. Chandlee, Thomas, *Cork*.
 1863. 14. Clarke, Rev. Benjamin, A. M., *Tuam, Galway*.
 1863. 15. Crozier, Lieutenant, R. E.
 1863. 16. Dale, J. C., F. L. S., *Granville, Wootton, Sherborne, Dorset*.
 1865. 17. Delap, Rev. A., *Milford*.
 1863. 18. Dickie, George, M. D., F. L. S., Professor of Botany, *Aberdeen*.
 1860. 19. Divers, Edward, M. D.
 1857. 20. Dixon, Rev. Robert Vickers, D. D., Ex-F. T. C. D., *Clougherney Rectory, Dungannon*.
 1863. 21. Douglas, J. W., 6, *Kingswood Terrace, Lea, Kent*.
 1841. 22. Du Noyer, George V., M. R. I. A., *Blackrock*.

Elected.

1863. 23. Enniskillen, Right Hon. the Earl of, F. R. S., M. R. I. A., *Florence Court, Enniskillen.*
1856. 24. Emerson, Rev. J. M., *Ballininan, Athy.*
- *1857. 25. Foot, Frederick J., M. A., F. R. G. S. I., *Geological Survey, Boyle.*
- *1859. 26. Gage, R. Connolly, *Rathlin Island, Ballycastle.*
- *1864. 27. Gahan, Alfred, C. E., *Donegal.*
1863. 28. Garner, Robert, F. L. S., *Stoke-upon-Trent.*
- *1863. 29. Gordon, Rev. George, *The Manse, Birnie, Elgin, N. B.*
1863. 30. Gosse, Philip Henry, F. R. S., *Sandhurst, Torquay.*
1863. 31. Grainger, John, *Belfast.*
1863. 32. Greene, Rev. Joseph, *Cubbleby Rectory, Doveridge, Derbyshire.*
- *1864. 33. Harte, William, C. E., F. R. G. S. I., *Buncrana.*
1858. 34. Harvey, Rev. Robert, *Leck Glebe, Letterkenny.*
1841. 35. Hassall, A. H., M. D., *London.*
1865. 36. Haughton, Lieutenant, R. A., *St. Helena.*
1863. 37. Higgins, Rev. H., *Liverpool.*
1863. 38. Hodges, J. F., Professor of Agriculture, *Belfast.*
1863. 39. Hogan, Rev. A. R., M. A., *Shaftsbury, Dorsetshire.*
1863. 40. Hooker, J. Dalton, M. D., F. R. S., F. L. S., F. G. S., *Royal Botanic Gardens, Kew.*
1863. 41. Humphreys, John, *Cork.*
1863. 42. Hyndman, E. C., *Belfast.*
- *1863. 43. Ingham, Captain J. C., *Athlone.*
1863. 44. Janson, E. W., *London.*
1863. 45. Jardine, Sir W., F. R. S., F. L. S., *Jardine Hall, Dumfriesshire.*
1863. 46. Jeffreys, J. Gwynne, F. R. S., *Swansea.*
1858. 47. Jones, Rev. H. H., *Adare.*
1857. 48. Kennedy, William, *Rathkeale.*
- *1857. 49. Kinahan, George Henry, *Geological Survey, Galway.*
1863. 50. King, W., Professor of Geology, *Queen's College, Galway.*
1863. 51. Knox, Rev. Thomas, A. M., *Lurgan.*
1863. 52. Lankester, Edwin, M. D., LL. D., F. R. S., F. L. S., 8, *Savile-row, London.*
1863. 53. Lane, P. W., M. D., M. R. C. S. E., *Newtownlimavady.*
1858. 54. Lawson, Henry, M. D., *London.*
1863. 55. Lea, John Walter, *The Grange, Shepperton-green, Chertsey, Surrey.*
1857. 56. Leckey, W., *Valentia Island.*
1858. 57. Loughran, William, A. L. S., *Polperro.*
1852. 58. Lowe, Edward J., F. R. A. S., F. L. S., F. G. S., *Nottingham.*
1863. 59. M'Andrew, Robert, F. R. S., F. L. S., *Islesworth.*
1863. 60. M'Gee, William, M. D., *Donegal-square, Belfast.*
1863. 61. M'Irwaine, Rev. W., M. A., *Hampton, Belfast.*
1858. 62. Martin, J., *Portlaw.*
1861. 63. Mayne, Rev. Charles, A. M., *Killaloe.*
1863. 64. Meade, R. H., *Bradford, Yorkshire.*
1863. 65. Melville, Alexander, M. D., Professor of Natural History, *Queen's College, Galway.*
1865. 66. Murray, J. S., *Milford.*
1860. 67. Newton, Alfred, M. A., F. L. S., *Elvedon Hall, Chetford, Sussex.*
1860. 68. O'Brien, George, M. D., *Ennis.*
1857. 69. O'Kelly, Joseph, C. E., *Geological Survey.*
1863. 70. Ogilby, William, F. R. S., *Lisclean, Dunamanagh.*
- *1863. 71. O'Meara, Rev. Eugene, A. M., *Newcastle-Lyons Rectory, Hazelhatch.*
1858. 72. Palmer, Sandford, *Ballinlough, Roscrea.*
1863. 73. Phillips, John, M. A., LL. D., F. R. S., *Oxford.*
1863. 74. Portlock, Major-General, R. E., LL. D., F. R. S.
1863. 75. Redfern, P., M. D.
1863. 76. Robinson, Rev. G. T.
1860. 77. Roland, J., M. D., *Bangor.*
1863. 78. Sclater, Philip Lutley, M. A., Ph. D., F. R. S., F. L. S., 11, *Hanover-square, London.*
1860. 79. Sigerson, George, M. D.
1863. 80. Smith, Frederick, *British Museum, London.*
1863. 81. Stainton, H. T., F. L. S., F. G. S., *Lewisham, Kent.*

Elected.

- 1863. 82. Thompson, Wyville, LL. D., *Belfast.*
- 1851. 83. Townsend, Ven. Hamilton, *Collooney.*
- *1861. 84. Vize, Rev. John E., *Bath.*
- 1863. 85. Waller, Edward, *Lissenderry, Aughnacloy.*
- 1863. 86. Ward, N. B., F. R. S., F. L. S., *London.*
- *1859. 87. Warren, Robert, Jun., *Moyview, Ballina.*
- 1863. 88. Westwood, J. O., A. M., F. L. S., *Oxford.*
- 1845. 89. Wilson, Lieut., R. N.
- 1863. 90. Wollaston, Thomas Vernon, A. M., F. L. S., *Hereford-street, Park-lane, London.*
- *1857. 91. Wynne, A. B., *Geological Survey.*

TOTAL NUMBER OF MEMBERS OF THE SOCIETY AT NOVEMBER 1, 1867.

Honorary Members,	22
Life Members,	23
Annual Members,	107
Associate Member,	1
Corresponding Members,	91
	244

[*Corrections of Errors, or Omissions, will be thankfully received by the Secretaries, addressed, ROYAL IRISH ACADEMY HOUSE, DAWSON-STREET, DUBLIN.*]

No. IX.

NATURAL HISTORY SOCIETY OF DUBLIN IN ACCOUNT WITH THE TREASURER.

	Dr.		Cr.
	£ s. d.		£ s. d.
To Investment in New 3 per Cent. Stock,	50 0 0	By Balance forward,	65 12 3
— Postage and Freight of Books, &c., from November, 1866, to November, 1866,	8 2 0	— Subscriptions,	90 5 0
— Illustrative Plate, Dr. E. P. Wright,	7 10 0	— One Year's Dividend on £173 19s. 8d. New 3 per Cent. Stock,	5 2 7
— Printing, &c., for 1866,	3 19 0		
— Attendance at Meetings,	2 10 0		
— Warren, for Glasses, 1866,	0 9 6		
— Newspapers and Postage,	0 9 2		
— Collector's Commission,	5 18 6		
— Balance,	82 1 8		
	<u>£160 19 10</u>		<u>£160 19 10</u>

We have audited the above Accounts, and find them correct, the Balance being £82 1s. 8d., and Reserved Fund in the New 3 per Cents. £173 19s. 8d.

ARTHUR ANDREWS, *Treasurer.*
 GEORGE PORTE, } *Auditors.*
 MAZIERE JOHNSTON, }
 Nov. 12, 1867.

DESCRIPTION OF PLATE III.,

ILLUSTRATING

MR. ARCHER'S PAPER ON SAPROLEGNIEÆ

(p. 136).

- Fig. 1. . Chain of four oogonia in *Saprolegnia androgyna*, sp. nov., showing the lateral male branchlets emanating from the oogonia; the two upper oogonia with fully-formed oospores, the lowest but one showing the contents commencing to become formed into primordial cells, or oospheres (Befruchtungskugeln, Pringsh.)—the future oospores; the lowest oogonium with the granular contents dense, but unchanged.
- „ 2. . A single terminal oogonium of *Achlya cornuta*, sp. nov.; its granular contents not yet commenced to be formed into a primordial cell or cells.
- „ 3 and 4. Series of oogonia, the first smaller, and with one oospore each, the latter larger, with a greater (variable) number; to the right of middle oogonium (Fig. 4) is seen a curious depressed lobate form assumed by one of the extensions, instead of the usual tapering cornua.
- „ 5. . Shows the development of the lateral branch just under an oogonium; and,
- „ 6. . Three such branches, two of which have become shut off at their extremities and developed each an oogonium, each with a single oospore.
-

[*Note*.—By an unfortunate oversight the above Plate is referred to in the Paper on Saprolegnieæ (p. 136), as Plate VI., in place of Plate III.]

DESCRIPTION OF PLATE IV.,

ILLUSTRATING

MR. ARCHER'S THREE PAPERS—ON ZYGOGONIUM AND MOUGEOTIA (p. 114)—ON ASTERIDIA IN PENIUM DIGITUS (p. 144), AND ON THE CONJUGATION OF TWO SPECIES OF SPIROTÆNIA (p. 147).

Figs. 1-11 \times 300; Fig. 12 \times 400.

- Fig. 1. . . Ordinary sterile filament of *Mougeotia lævis*, Arch. (= *Zygonium læve* (Kütz.)? Unfortunately this figure is faulty in not displaying the central nucleus in each joint.
- „ 2 and 3. Conjugated state of same, showing the zygospores free in the cavity of the transverse tube, the whole contents of the parent cells being absorbed in their formation, and not a central portion only shut off in a special chamber, as in *Mesocarpus*.
- „ 4. . . A pair of Asteridia shown within the cavity of the cell of an example of *Penium digitus*, a portion of the original contents of which have become effete and brown coloured.
- „ 5. . . A pair of examples of *Spirotænia condensata* in juxta-position for the purpose of conjugation; the contents of both individualized into two portions, each becoming contracted into an elliptic figure, the spiral arrangement of the band of endochrome becoming effaced.
- „ 6. . . The opposite masses of the contents of the original pair of parent-cells now coalesced, and gradually assuming the globular figure and rigid cell-wall shown in next figure.
- „ 7. . . The pair of zygospores having now assumed a globular figure, but not yet showing the honeycomb external decoration.
- „ 8. . . The latter more advanced and coating of mucus more densely developed, with a sharply-defined boundary.
- „ 9. . . The pair of zygospores more fully formed, focussed down to the equatorial line, showing the honeycomb structure in side view.
- „ 10. . . The same focussed up a little, so as to see partially into the cavities of the honeycomb structure.
- „ 11. . . An empty zygospore, focussed above an equatorial line, showing the mouths of the cells of the honeycomb.
- „ 12. . . The angularly-lobed zygospore of *Spirotænia truncata* (Arch.), the four half-cells of the parent pair of cells still appended.

[*Note*.—By an unfortunate oversight the above Plate is referred to in the Paper on Asteridia in *Penium* (p. 144), and on *Spirotænia* (p. 147), as Plate VIII. in place of Plate IV.]

DESCRIPTION OF PLATE V.,

ILLUSTRATING

REV. E. O'MEARA'S PAPER ON NEW DIATOMS FROM DREDGINGS
MADE OFF ISLANDS OF ARRAN, CO. GALWAY (p. 106).

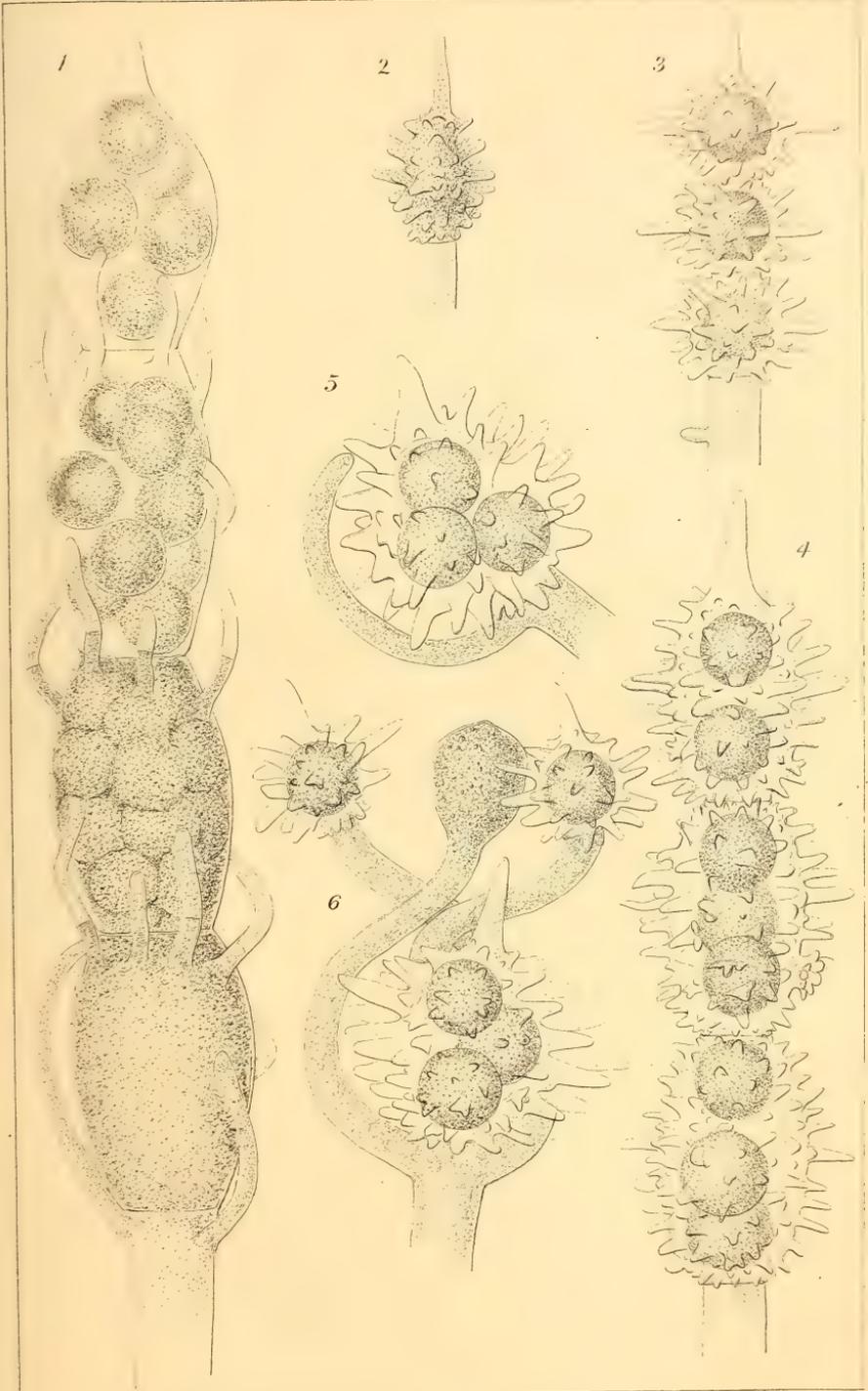
Fig. 1.	.	<i>Navicula hibernica</i> ,	.	.	.	× 400.
" 2.	.	"	<i>denticulata</i> ,			"
" 2b.	.	"	"	front view,		"
" 3.	.	"	<i>pellucida</i> ,			"
" 3b.	.	"	"	front view,		"
" 4.	.	"	<i>Wrightii</i> ,			"
" 4b.	.	"	"	variety,		"
" 5.	.	"	<i>amphoroides</i> ,			"
" 6.	.	<i>Pinnularia arraniensis</i> ,				"
" 7.	.	"	<i>divaricata</i> ,			"
" 8.	.	"	<i>constricta</i> ,			"
" 8b.	.	"	"	front view,		"
" 9.	.	"	<i>forficula</i> ,			"
" 10.	.	<i>Surirella pulcherrima</i> ,				"
" 11.	.	"	<i>gracilis</i> ,			"

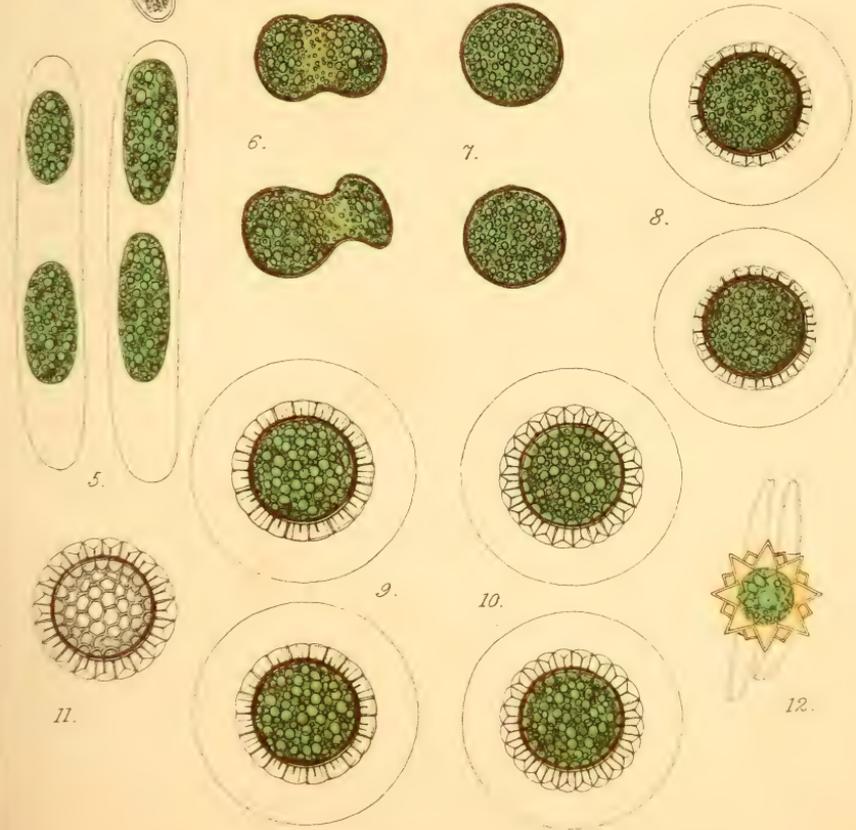
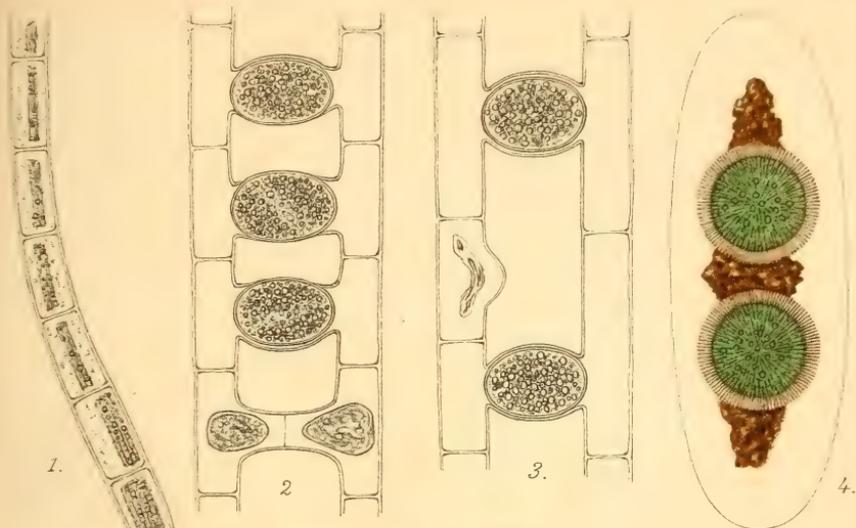
DESCRIPTION OF PLATE VII.,

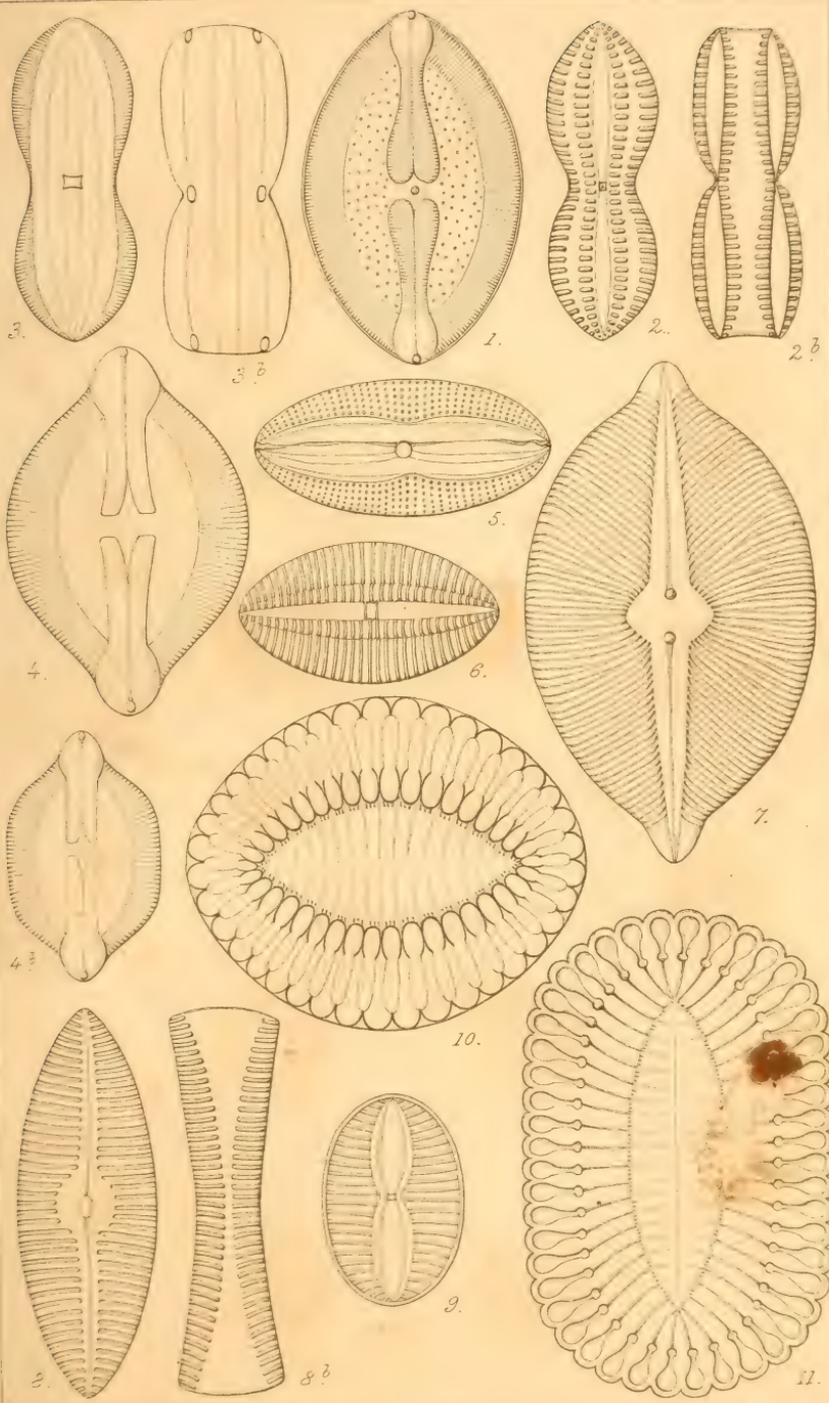
ILLUSTRATING

REV. E. O'MEARA'S SECOND PAPER ON NEW DIATOMS FROM DREDG-
INGS MADE OFF ISLANDS OF ARRAN, CO. GALWAY (p. 155).

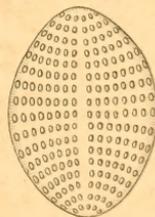
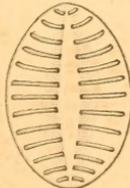
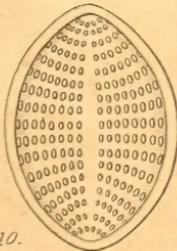
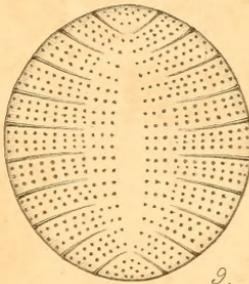
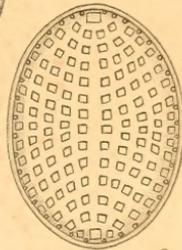
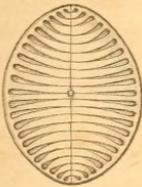
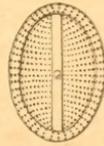
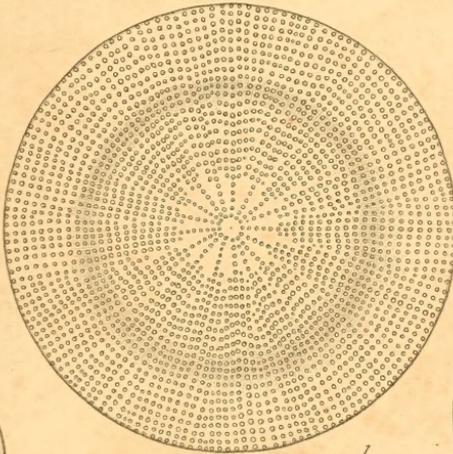
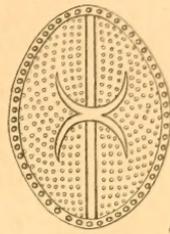
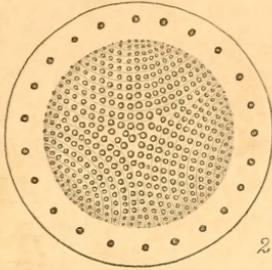
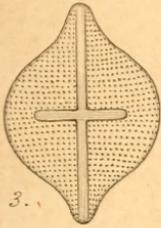
- Fig. 1. . *Coscinodiscus fasciculatus*, × 600.
" 2. . *Eupodiscus excentricus*, × 800.
" 3. . *Stauroneis rhombica*, × 600.
" 4. . " *costata*, × 600.
" 5. . *Cocconeis clavigera*, × 600.
" 6. . " *Wrightii*, × 800.
" 7. . " *Portei*, × 800.
" 8. . *Rhaphoneis liburnica*, var. × 600.
" 9. . " *suborbicularis*, × 600.
" 10. . " *Jonesii* × 600.
" 11. . " *Moorei* × 600.
" 12. . " *Archeri* × 600.















CONTENTS.

	PAGE.
With Plates III., IV., V., and VII. (Plate VI. appeared in preceding Part).	
1. Report from Council, presented 1st November, 1866,	93
2. Notes on the Flora of the Islands of Arran, West of Ireland. By E. PERCEVAL WRIGHT, M. D., F. L. S., &c.,	96
3. On some New Diatomaceæ collected off the Arran Islands by Dr. E. Perceval Wright. By the REV. EUGENE O'MEARA, A. M. (Plate V.),	106
4. On a new Station of <i>Hymenophyllum Wilsoni</i> and <i>H. Tunbridgensis</i> . By F. J. FOOT, M. A., F. R. G. S. I.,	110
5. On the Occurrence in Ireland of Two Plants new to the Irish Flora, <i>Eriophorum alpinum</i> and <i>Acorus calamus</i> . By DAVID MOORE, PH. D., F. L. S., M. R. I. A.,	112
6. Note on the "Blue Mist." By J. J. LALOR, F. R. G. S. I.,	113
7. Remarks on the Genera <i>Zygogonium</i> (de Bary) and <i>Zygogonium</i> (Kütz.), with Description of the conjugated state of the Plant believed to be identical with <i>Zygogonium læve</i> (Kütz.), but which is referable rather to the genus <i>Mougeotia</i> (de Bary, non Agardh). By WILLIAM ARCHER. (Plate IV.),	114
8. Zoological Notes. By WILLIAM ANDREWS, M. R. I. A.,	122
9. On <i>Bothriocephalus latus</i> , or Broad Tapeworm—its Occurrence in Ireland; with Remarks on its claim for admission into the List of our indigenous Fauna. By DR. WILLIAM FRAZER, M. R. I. A., &c.,	125
10. Notes on some Larva-cases from Australia. By DR. ALEXANDER MACALISTER,	129
11. On Two new Species of Saprolegniæ referable, respectively, to the genus <i>Saprolegnia</i> (Nees von Esenb.), and <i>Achlya</i> (Nees von Esenb.). By WILLIAM ARCHER. (Plate III.),	136
12. Notes on <i>Tenia mediocanellata</i> (Küchenmeister), being its first recorded occurrence in Ireland. By DR. WILLIAM FRAZER, M. R. I. A., &c.,	142
13. Note on "Asteridia" occurring in <i>Penium digitus</i> (Bréb.). By WILLIAM ARCHER. (Plate IV.),	144
14. On the Conjugation of <i>Spirotania condensata</i> (Bréb.), and of <i>Spirotania truncata</i> (Arch.). By WILLIAM ARCHER. (Plate IV.),	147
15. Notes on the Rose-hill Parroquet (<i>Platyercus eximius</i>). By JOHN BARKER, M. D., &c.,	153
16. Occasional Notes on the Occurrence of Rare Birds in the vicinity of the Shores of the River Moy and Killala Bay. No. V.—On the Occurrence of the Spotted Redshank and Wild Swan. By ROBERT WARREN, JUN.,	154
17. On New Forms of Diatomaceæ from Dredgings off the Arran Islands, Co. Galway. By the REV. EUGENE O'MEARA, A. M. (Plate VII.),	155
18. Note of Some Species of Mosses new to the Irish Flora. By DAVID MOORE, PH. D., F. L. S., M. R. I. A., &c.,	158
19. On the Stinging Properties of the Physalia or Portuguese Man-of-War. By A. W. FOOT, M. D., &c.,	159
Annual General Meeting; Council and Officers for 1866-67,	93
APPENDIX,	xiii-xxvii
Societies entitled to receive the "Proceedings,"	xiv
Publications of other Societies received,	xvii
List of Members of the Natural History Society of Dublin,	xxi
Treasurer's Account (to November, 1867),	xxvii

 To the Binder.—Please cancel Page xii. (bis) of Appendix, as furnished in last Part, as it is reprinted herewith (p. xiii.), in order that the pages might run continuously, without leaving succeeding page blank.