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THE GLASGOW NATURALIST.

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The Glasgow :: Naturalist

THE JOURNAL OF THE
NATURAL HISTORY SOCIETY OF GLASGOW

(Including the *Transactions and Proceedings* of
the Society, Third Series).



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Volume VII.
EDITED BY
JOHN PATERSON.

1915.

GLASGOW: JOHN SMITH & SON (GLASGOW), LIMITED,
19 RENFIELD STREET.

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PRINTED BY
ROBERT ANDERSON, 142 WEST NILE STREET,
GLASGOW.

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The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VII., No. 1.]

[February, 1915.

The "Hydroid" Stage of *Lar sabellarum*, Gosse (new Firth of Clyde record).

By JAMES F. GEMMILL, M.A., M.D., D.Sc.

[Read 27th October, 1914.]

Lar sabellarum Gosse, one of the Hydromedusae, is a species of quite unusual interest. Though belonging to the Gymnoblastera, the hydropolyp is strikingly different from the usual gymnoblastic type, while the medusa shows characters to some extent intermediate between two great Sub-Orders, the Antho- and the Lepto-medusae. (See E. T. Browne in *Proc. Zool. Soc. Lond.*, 1896, p. 472.)

The hydroid in question was discovered, and described (*Trans. Linn. Soc.*, 1857, Vol. 22, pp. 113-116), as a new genus and species, by Gosse, who found a vigorous colony growing round the mouth of a *Sabella* tube in one of his aquaria. He gave a very lively account of the quaint mannikin-like individuals, and of their grotesque bending and swaying antics round the mouth of the tube, and he not inappropriately named his new genus "*Lar*," or domestic god of the Sabellids. The most striking feature of the genus is the possession of only two tentacles springing from one side of the base of a highly movable bilabiate "proboscis," which is separated by a slight constriction from the rest of the body.

In 1872, near Ilfracombe, Hincks dredged up another colony on a *Sabella* tube. He was fortunate enough to observe liberation of the young medusae, and he described their characters as

well as those of the reproductive individuals (*Ann. Nat. Hist.*, Ser. 4, Vol. X., pp. 313-317). The latter are slender, destitute of tentacles, terminated by a slight globular enlargement, and bearing the gonozooids in clusters of three or four on the sides of their outer portions.

E. T. Browne (*op. cit.*, pp. 468-472) described the series of stages through which the young medusa reaches its adult form, and pointed out that one of these stages had been figured and described by Edward Forbes ("British Naked-Eyed Medusae," *London Ray Society*, 1848) under the name of *Willsia stellata*.

As regards West of Scotland records, the medusa of *Lar* was found by E. T. Browne (*Proc. Roy. Soc. Edinb.*, 1905, Vol. 25, p. 753) in Firth of Clyde Plankton, from July to November in 1901 and 1902. Since then Mr. James Dick has noted it during the same months and also during May and June.

The Hydroid stage, however, does not appear to have been found. See *Handbook on Nat. Hist., Glasgow & West of Scotland*: British Association, 1901 (edited by Scott Elliot, Laurie, and Barclay Murdoch), and *Ann. Report, 1911, Marine Biolog. Assoc. West Scot.* (Lists edited by L. A. L. King). However, in autumn 1913, along with Mr. Elmhirst, Superintendent of the Millport Marine Station, I did some dredging at Tarbert, Loch Fyne, bringing a little of the material alive to Glasgow, where it was kept under "convection-current" circulation (*Journ. Roy. Micro. Soc.*, 1913, pp. 247-9). The material included small Sabellids, and in course of time a few tiny hydroid-like growths were observed near the open ends of two of their tubes, but the specimens were not suitably placed in the aquarium for examination under moderately high magnification. However, from May to July, 1914, several gonozooids were budded off from the colony, and Mr. James Dick identified these as being the first stage of the medusa of *Lar sabellarum*. In one case I noted that intermittent contractions of the umbrella took place at least 12 hours prior to liberation. Two of the gonozooids remained alive for three or four weeks. The upper end of a colony-bearing tube was cut off and preserved, and this enabled the diagnosis of the hydroid itself to be established. The tube in question was exhibited by Dr. Gemmill to the Society.

Notes on Microfungi observed in the Lochlomond District.

By D. A. BOYD.

[Read 29th December, 1914.]

ON account of the wide extent of its surface, and the rare beauty of its shores and islands, Lochlomond has been appropriately termed "The Queen of Scottish Lakes." From a naturalist's point of view, however, the attractions of the loch are materially enhanced by its interesting physical features, which differ from those of any other lake in Britain. One of its most remarkable characteristics is the low level of the surface, which stands only 25 feet above that of the sea itself. On the other hand, in striking contrast are the lofty mountain-peaks which form the watershed between the Lochlomond basin and Lochlong, Lochfyne, Strathfillan, and the head-streams of the River Forth. These include the highest summits attained anywhere within the Clyde Area, and possess a flora of a more alpine character than is to be found elsewhere within that region. In the neighbourhood of the loch, as well as in many of the rocky glens through which the tributary streams make a rapid descent, and on the mountains themselves, the prevailing schistose rocks afford a fertile soil peculiarly favourable to the development of a rich and varied flora. Another interesting feature is the proximity of the high peaks in Glenfalloch to those bordering on Strathfillan and the Breadalbane range. As the latter form one of the most fertile botanical regions in Britain, it is probable that the minute spores of such cryptogams as mosses, hepatics, fungi, and lichens, may often be carried by the wind from one lofty mountain to another, and find on the latter a congenial soil on which to germinate and grow.

So far as the investigation of its mycology is concerned, the Lochlomond district appears to have hitherto been almost neglected. Very little published information on the subject is anywhere obtainable, with the exception of a few notices of

species observed from time to time at our own excursions or those of the Andersonian Naturalists' Society. On such occasions, however, the limited time available did not usually admit of more than a very hasty and superficial search being made. The following notes are therefore submitted in the hope that they may serve to bring more prominently into notice the remarkable richness of the district as a field for research in cryptogamic botany, and its claim to a much larger amount of attention than has as yet been bestowed upon it.

As the River Leven forms the outlet from Lochlomond into the River Clyde, reference may be made to several interesting microfungi observed in those portions of the parishes of Bonhill and Kilmarnock which drain into the former stream. These were visited at an excursion of the Andersonian Naturalists' Society, on 2nd August, 1913.

Near Balloch, many of the Black Currant bushes in a roadside garden were found to be affected by *Glæosporium curvatum* Oud., which produced small brownish pustules or blisters on the surface of the living leaves. The species is noteworthy as a comparatively recent addition to the British list, having been reported from Ayrshire and afterwards detected in various other parts of the West of Scotland. It seems to have been long confused with *G. ribis* (Lib.) Mont. & Desm., which occurs commonly on living leaves of Red Currant, and produces pustules very similar in appearance to those caused by *G. curvatum*. The spores of *G. ribis*, however, are hyaline, oblong, regularly curved, and measure $\cdot 010 \times \cdot 005$ mm.; while those of *G. curvatum* measure $\cdot 014 - \cdot 020 \times \cdot 005 - \cdot 007$ mm., and are much more irregular in shape and curvature. Nearly all the specimens of diseased Black Currant leaves I have recently examined show the attacking fungus to be *G. curvatum*, while those of Red Currant appear generally to be affected by *G. ribis*. Another interesting species observed in the neighbourhood of Balloch was *Ovularia sphæroidea* Sacc., a parasitic mould which produced rather dense snow-white patches of fertile threads on the under surface of the Greater Bird's-foot Trefoil. As is implied by the specific name, the conidia are mostly spherical in shape, and measure from $\cdot 008$ to $\cdot 010$ mm. in diameter.

At Caldervan Loch, in the parish of Kilmarnock, I was pleased to find specimens of *Peronospora valerianæ* Trail, a very rare parasite, which occurred on leaves of Common Valerian. This species was discovered in Argyllshire many years ago by Professor Trail, Aberdeen, one of the Society's Corresponding Members. I am not aware that it has been recorded for any other locality in Britain, and its occurrence in the Clyde Area is therefore a fact of considerable interest. The conidia are developed on branched threads of a greyish-violet tinge, produced in lax clusters on the lower surface of the leaflets. The affected portions of the latter are somewhat pale or yellowish on the upper side, owing to the deficiency of chlorophyll in the cells. A peculiarity in this species, observed by Professor Trail in his original specimens, was the apparent absence of oospores in the affected tissues of the host; and it is interesting to note that in my own specimens, sent to the British Museum for preservation, the same feature has also been commented upon. This species must be carefully distinguished from *Ramularia valerianæ* (Speg.) Sacc., another parasitic mould which often attacks the same host. In the latter the threads are very much shorter, the conidia cylindrical in form, and the affected spots much smaller, and usually brownish or withered on the upper surface. In the same locality, on leaves of Bogbean, were found *Protomyces menyanthis* De Bary, which formed small purplish warts or swellings; and *Phyllosticta destructiva* Desm. and *Septoria menyanthis* Desm., which both produced discoloured spots on the affected foliage. Another interesting species, also a comparatively recent addition to the British list, was *Gnomonia lugubris* Karst., which occurred in some abundance on dead leaves of Marsh Cinquefoil. This, like others of its genus, is readily distinguished by the long beak attached to the mouth of the perithecium. The spores are fusiform-oblong, uniseptate, with four large guttulæ. Another recent addition to the British fungus-flora was *Glæosporium pruinosum* Bäumler, which produced its characteristic wart-like pustules on fading leaves of Brooklime.

Several of the wooded islands on Lochlomond afford ideal conditions for the development of many forms of fungus life, but very little information regarding them has as yet been

reported. At an excursion of our society to Inchlonaig, on 19th June, 1909, *Hormiscium pithyophilum* Nees, one of the brown moulds was observed on the bark of the ancient yew-trees on that island by Mr. John Paterson who, some years earlier, found the same fungus on the great yew-tree which gives its name to the Yew Tree Lodge at Rosdhu.

An excursion of our Society to Rowardennan, on 21st June, 1913, was productive of several interesting species; although the ground examined did not prove so rich as did other places situated on the opposite shores of the loch. The most notable fungi secured were mature and fully-expanded cups of *Sclerotinia Curreyana* (Berk.) Karst., developed from sclerotia formed in dead culms of the common Rush. These sclerotia are very common in most localities, and are usually found in rush-stems of a very pale-yellow colour. Although not externally visible, they are easily detected by subjecting the rush-stem to slight pressure and drawing it between the fore finger and thumb. When cut open, each sclerotium is internally of a pink colour, on which account it was at one time described as a distinct species of fungus under the name of *Sclerotium roseum* Kneiff. The developed cups are regarded as somewhat rare, although they may probably be often overlooked, owing to their close resemblance in colour to the rushes on which they grow. On dead Brackens were found the tiny cups of two minute Discomycetes, viz., *Urceolella pteridis* (A. & S.) Boud., which occurred on the stems, and *Micropodia grisella* (Rehm) Boud., very abundantly on the under surface of the withered pinnæ or leaflets when lying on the ground in damp places.

A brief exploration of the loch-side at Tarbet, on 17th September, 1913, led to several notable discoveries. On the under surface of living leaves of Blaeberry, the tiny black perithecia of *Podosphæra myrtillina* (Schub.) Kunze were abundant, and bore some resemblance to minute groups of spiders of truly microscopic dimensions. Among other records then obtained were *Coccomyces dentatus* (Kze. & Schm.) Sacc., on dead leaves of oak; *Venturia ilicifolia* Cooke, on dead leaves of Holly; *Septoria lysimachicæ* West., parasitic on leaves of Yellow Loosestrife; *S. virgaureæ* Desm., on those of Golden-rod; and *S. myricæ* Trail, on fading leaves of Bog Myrtle. In addition to

these species, reference may be made to several others observed by Professor Trail in the course of a brief visit made to the Tarbet district, and recorded by him in the *Scottish Naturalist* for 1888. Of these the most notable was *Ophiobolus immersus*, detected on dead stems of Nettle, and described by Professor Trail as new to science. This fungus is said to differ from all other species of *Ophiobolus* in having the perithecia embedded in the tissues of the host—a feature which might justify its being placed in a separate genus to be founded for its reception. Among other species recorded by him for Tarbet may be noted *Phyllosticta ligustri* Sacc., which occurred in withered spots on living leaves of Privet; and *Septoria prunellæ* Trail, on fading leaves of Selfheal.

Early last century, various microfungi were recorded for the Lochlomond district by Dickson and others, and were probably obtained on the western shores of the lake. These include two species of Discomycetes bearing club-shaped ascophores, viz., *Microglossum viride* (Pers.) Gill., which usually develops its green clubs on the ground in woods; and *Mitruia phalloides* (Bull.) Chev., a beautiful little fungus which sometimes grows in immense numbers on decaying vegetation in shallow ditches, especially in highland districts, where its bright orange-coloured clubs are frequently so conspicuous as readily to attract the notice of every passer-by.

A walk through Glenfalloch, on the occasion of our Society's excursion to that district on the Glasgow autumn holiday (28th September, 1914), enabled material additions to be made to existing information regarding the microfungi of the portion of the district situated between Ardlui and the watershed south of Crianlarich. In a small marsh, a short distance above Ardlui, some specimens were obtained of *Doassansia Martianoffiana* Schroet., a species recently added to the British list. It occurs on leaves of *Potamogeton* growing in comparatively dry or shallow ditches or marshes on a peaty soil. The spore-clusters are produced under the epiderm, in pale yellowish spots, and are very easily seen when an affected leaf is held between the eye and the light. A welcome addition to the local list was afforded by *Uncinula prunastri* (DC.) Sacc., which was abundant on living leaves of Sloe, on the roadside between Ardlui and Inverarnan; while near the latter place, the leaves of currant-bushes in a

small garden were found to be affected by *Septoria ribis* Desm. Above Inverarnan, and in the ascent of Glenfalloch towards the Falls, the mycological richness of the locality was fully demonstrated. Leaves of Hawkweed showed the discoloured spots indicative of the presence of *Entyloma calendulæ* (Oud.) Schroet.; while on fronds of Hard-Fern and Common Polypody were noticed respectively the pale pustules of *Milesina blechni* Syd. and *M. Dieteliana* Magn.,—the latter a much-coveted rarity. *Podosphaera myrtillina* (Schub.) Kunze was very abundant on leaves of Blaeberry; *Phyllactinia corylea* (Pers.) Karst., on those of Birch; and *Septoria myricæ* Trail, on fading leaves of Bog Myrtle. Near the head of the glen, *Septoria acetosæ* Oud., a recent addition to the British list, occurred as a parasite on leaves of Sorrel; while *Septoria plantaginea* Pass. was also detected on fading leaves of Ribwort Plantain.

Several interesting microfungi have also been observed during former visits to Glenfalloch. In July, 1907, in the course of an ascent of the mountains at the head of the glen, I obtained specimens of *Synchytrium succisæ* De Bary & Wor., a parasite which produces yellowish warts on leaves, &c., of Devil's-bit Scabious; *Coccomyces Boydii* A. L. Smith, a remarkable species, found on dead branches of Bog Myrtle at two places on the hills, but not yet reported from any other locality; *Vibrissea truncorum* (A. & S.) Fr., on dead branches of Heather in very wet places; *Venturia atramentaria* Cooke, on dead leaves of Bog Whortleberry; *V. myrtilli* Cooke, on dead leaves of Blaeberry; *Synchytrium aureum* Schroet., on stems of Thyme growing at a height of over 2,000 feet; and another species of *Synchytrium* (unidentified), on stems of StoneBedstraw at a similar elevation. At Falls of Falloch have occurred *Coccomyces quadratus* (Kze. & Schm.) Karst., on dead twigs of Blaeberry; *Orbilbia Boydii* A. L. Sm. & Ramsb., on dead branches of the same shrub; and *Meliola Niessleana* Wint., on living leaves and twigs of Cowberry.

When visiting Glenfalloch on 28th September last, I obtained from a roadside garden, near Crianlarich, some Black Currant leaves affected with *Glæosporium curvatum* Oud.; but as these occurred on the northern side of the watershed, they must be reported as affording a record for the Tay Area rather than for Clyde.

Records of Microfungi for the Lochlomond District.

THE following list of records of Microfungi for the Lochlomond District is based for the most part on observations made during brief visits to the various localities mentioned. While therefore affording an indication of the general character of the flora, the list must obviously be defective as containing no reference to many of the more minute forms which can only be discovered after a careful search. It may be noted that species recorded for "Balloch" were found in the portion of the Parish of Bonhill situated between Balloch railway station and the parochial boundary near Caldarvan;* while those reported for "Ardlui" occurred between the railway station and the county boundary at Inverarnan;† and those for "Glenfalloch" were observed between Inverarnan and the watershed south of Crianlarich, or on the ascent of the hills at the head of the glen.

As regard arrangement, it may be stated that the Uredineæ are mostly grouped and named in accordance with Professor W. B. Groves' recently published work on that subject; while the Discomycetes are arranged in accordance with Boudier's system, as embodied in the list of British species compiled by Mr. J. Ramsbottom, M.A., F.L.S.‡

Plasmopara densa (Pers.) Schroet. On *Rhinanthus Crista-galli*;
Caldarvan, Glen Douglas.

Bremia lactucæ Regel. On *Senecio vulgaris*; Tarbet (Trail),
Ardlui.

Peronospora ficariæ Tul. On *Ranunculus Ficaria*; Glenfalloch.

P. valerianæ Trail. On *Valeriana officinalis*; Caldarvan.

Synchytrium aureum Schroet. On *Thymus Serpyllum*;
Glenfalloch.

S. succisæ De Bary & Wor. On *Scabiosa succisa*; Glen Douglas,
Glenfalloch.

Protomyces macrosporus Ung. On *Egopodium Podagraria*;
Balloch, Caldarvan.

* These, along with the numerous records for Caldarvan, were obtained at an excursion of the Andersonian Naturalists' Society, on 2nd August, 1913.

† Previous records, reported for "Ardlui" by other workers, are not subject to this restricted definition of area.

‡ *Transactions of the British Mycological Society*, Vol. IV., page 343.

- P. menyanthis* De Bary. On *Menyanthes trifoliata*; Caldarvan.
Ustilago avenæ Jensen. On *Avena sativa*; Balloch, Caldarvan.
U. violacea (Pers.) Wint. On *Lychnis*; Caldarvan.
Tilletia decipiens (Pers.) Körn. On *Agrostis vulgaris*;
 Glenfalloch.
Entyloma ranunculi (Bon.) Wint. On *Ranunculus Ficaria*;
 Glenfalloch.
E. Fergussoni (B. & Br.) Plow. On *Myosotis arvensis*; Glen-
 falloch.
E. calendulæ (Oud.) Schroet. On *Hieracium*; Glenfalloch.
Doassansia Martianoffiana Schroet. On *Potamogeton*; Ardlui.
Uromyces valerianæ Fekl. On *Valeriana officinalis*; Caldarvan.
U. flectens Lagerh. On *Trifolium repens*; Balloch.
U. scillarum Wint. On *Scilla non-scripta*; Glenfalloch.
U. poæ Rabh. As *Æcidium* on *Ranunculus Ficaria*; Ardlui
 (Scott Elliot), Glenfalloch.
Puccinia centaureæ DC. On *Centaurea nigra*; Balloch,
 Glenfalloch.
P. cirsii Lasch. On *Cnicus palustris*; Rowardennan.
P. obtogens Tul. On *Cnicus arvensis*; Balloch.
P. major Dietel. On *Crepis paludosa*; Glenfalloch.
P. hieracii Mart. On *Hieracium*; Tarbet.
P. valantiæ Pers. On *Galium saxatile*; Glen Douglas, Glen-
 falloch.
P. menthæ Pers. On *Mentha*; Caldarvan.
P. annularis Schlecht. On *Teucrium Scorodonia*; Tarbet.
P. primulæ Duby. On *Primula vulgaris*; Ardlui, Glenfalloch.
P. tumida Grev. On *Conopodium majus*; Glenfalloch.
P. pulverulenta Grev. On *Epilobium montanum*; Glenfalloch.
P. violæ DC. On *Viola Riviniana*; Balloch, Ardlui, Tarbet,
 Rowardennan, Glenfalloch.
P. Fergussoni B. & Br. On *Viola palustris*; Caldarvan.
P. oblongata Wint. On *Luzula*; Glen Douglas, Rowardennan,
 Glenfalloch.
P. borealis Juel. As *Æcidium thalictri* Grev., on *Thalictrum*
alpinum; Ben Voirlich (Patterson, 1821).*

* For information regarding this interesting species, reference may be made to a paper on "Some Scottish Rust Fungi," by Malcolm Wilson, D.Sc., F.L.S., in the *Journal of Botany*, for February, 1915, page 43.

- P. anthoxanthi* Fekl. As *Uredo* on *Anthoxanthum odoratum* ;
Ben Voirlich (Dr. M. Wilson, l.c.)
- P. holcina* Erikss. As *Uredo* on *Holcus* ; Balloch, Caldarvan.
- P. poarum* Niels. As *Æcidium* on *Tussilago Farfara* ; Balloch.
- Phragmidium violaceum* Wint. On *Rubus fruticosus* ; Tarbet,
Ardlui.
- Ph. mucronatum* Fr. On *Rosa* ; Ardlui, Glenfalloch.
- Coleosporium campanulæ* Lév. On *Campanula rotundifolia* ;
Glen Douglas, Ardlui (Scott Elliot), Glenfalloch.
- Melampsora larici-caprearum* Kleb. As *Uredo* on *Salix caprea* ;
Tarbet, Glenfalloch.
- M. hypericorum* Wint. As *Uredo* on *Hypericum pulchrum* ;
Tarbet.
- Melampsoridium betulinum* Kieb. On *Betula alba* ; Caldarvan,
Tarbet, Glenfalloch.
- Thecopsora vacciniorum* Karst. As *Uredo* on *Vaccinium*
Myrtillus ; Tarbet, Ardlui, Glenfalloch.
- Milesina blechni* Syd. On *Blechnum Spicant* ; Glenfalloch.
- M. Dieteliana* Magn. On *Polypodium vulgare* ; Glenfalloch.
- Peziza aurantia* Pers. On the ground ; Tarbet (Trail).
- Coprobria granulata* (Bull.) Boud. On cow-dung ; Balloch.
- Ascobolus stercorarius* (Bull.) Schroet. On cow-dung, Balloch.
- A. glaber* (Bull.) Schroet. On cow-dung, Balloch.
- Exoascus alnitorquus* (Tul.) Sadeb. On *Alnus rotundifolia* ;
Caldarvan.
- E. potentillæ* (Farl.) Sacc. On *Potentilla erecta* ; Glen Douglas,
Rowardennan.
- Microglossum viride* (Pers.) Gill. On the ground ; Lochlmond
(Dickson).
- Mitruha phalloides* (Bull.) Chev. On decaying vegetation in
wet places ; Lochlmond (Dickson), between Balmaha and
Rowardennan (R. B. Johnstone), Glenfalloch.
- Vibrissea truncorum* (A. & S.) Fr. On dead branches and
heather in wet places ; Glen Douglas, Glenfalloch.
- Apostemidium Guernisaci* (Crouan) Boud. On dead branches of
Salix immersed in stream ; Glen Douglas.
- Coryne urnalis* (Nyl.) Sacc. On rotten wood ; Ardlui.
- Orbilia Boydii* A. L. Sm. & Ramsb. On dead branches of
Vaccinium Myrtillus ; Glenfalloch.

- Sclerotinia Curreyana (Berk.) Karst. In dead stems of *Juncus conglomeratus*; Rowardennan.
- Dasyscypha crucifera (Phil.) Sacc. On dead branches of *Myrica Gale*; Rowardennan, Ardlui.
- Trichoscypha calycina (Schum.) Boud. On dead bark of *Larix europæa*; Rowardennan.
- Micropodia grisella (Rehm) Boud. On dead fronds of *Pteris aquilina*; Rowardennan, Glenfalloch.
- Urceolella pteridis (A. & S.) Boud. On dead stipites of *Pteris aquilina*; Rowardennan.
- Mollisia cinerea (Batsch) Karst. On rotten wood; Rowardennan.
- Pezicula rhabarbarina (Berk.) Tul. On dead branches of *Rubus fruticosus*; Glenfalloch.
- Trochila craterium (DC.) Fr. On dead leaves of *Hedera Helix*; Glen Douglas, TARBET.
- Xylographa parallela (Ach.) Fr. On dead wood; Glenfalloch (Dr. Holl).
- Pseudopeziza trifolii (Bern.) Fckl. On *Trifolium repens*; Balloch, Caldaran, Ardlui.
- Ps. repanda (Fr.) Karst. On *Galium saxatile*; Rowardennan.
- Ps. alismatis (Phil. & Trail) Sacc. On *Alisma Plantago-aquatica*; Caldaran.
- Stegia ilicis Fr. On dead leaves of *Ilex Aquifolium*; Caldaran, Rowardennan, TARBET, Glenfalloch.
- Coccomyces dentatus (Kze. & Schm.) Sacc. On dead leaves of *Quercus Robur*; TARBET.
- C. quadratus (Kze. & Schm.) Karst. On dead twigs of *Vaccinium Myrtillus*; Glenfalloch.
- C. Boydii A. L. Smith. On dead branches of *Myrica Gale*; Glenfalloch.
- Colpoma quercinum (Pers.) Wallr. On dead twigs of *Quercus Robur*; Rowardennan, Glenfalloch.
- Rhytisma acerinum (Pers.) Fr. On a fallen leaf of *Acer Pseudo-platanus*; TARBET.
- Hypoderma virgultorum DC. On dead branches of *Rubus fruticosus*.
- Lophodermium arundinaceum (Schr.) Chev. On dead grass; Glenfalloch.

- L. cladophilum* (Lév.) Rehm. On dead twigs of *Vaccinium Myrtillus*; Glenfalloch.
- L. maculare* (Fr.) De Not. On dead leaves of *Quercus Robur*; Lochlomond (Greville).
- L. pinastri* (Schrad.) Chev. On dead leaves of *Pinus sylvestris*.
- Dichæna quercina* (Pers.) Fr. Undeveloped condition on bark of *Quercus Robur*; Tarbet, Glenfalloch.
- Podosphæra oxyacanthæ* (DC.) De Bary. On *Crataegus Oxyacantha*; Rowardennan.
- P. myrtillina* (Schub.) Kunze. On *Vaccinium Myrtillus*; Tarbet, Ardlui, Glenfalloch.
- Phyllactinea corylea* (Pers.) Karst. On *Betula alba*; Glenfalloch.
- Erysiphe Martii* Lév. On *Pisum sativum*; Ardlui.
- Uncinula aceris* (DC.) Sacc. On *Acer Pseudo-platanus*; Tarbet (Trail).
- U. prunastri* (DC.) Sacc. On *Prunus*; Ardlui.
- Meliola Niessleana* Wint. On *Vaccinium Vitis-Idæa*; Glenfalloch.
- Asterina veronicæ* (Lib.) Cooke. On *Veronica officinalis*; Ardlui.
- Cordyceps militaris* (Linn.) Link. On dead lepidopterous pupæ; Glen Douglas.
- Eleutheromyces subulatus* (Tode) Fekl. On hard blackened agarics; Tarbet (Greville).
- Phyllachora junci* (Fr.) Fekl. On dead stems of *Juncus conglomeratus*; Caldarvan, Rowardennan.
- Hyospila pustula* (Pers.) Karst. On dead leaves of *Quercus Robur*; Glenfalloch.
- Stigmatea Robertiani* Fr. On living leaves of *Geranium Robertianum*; Tarbet.
- Gnomonia lugubris* Karst. On dead leaves of *Potentilla palustris*; Caldarvan.
- Botryosphæria dothidea* (Moug. & Fr.) Ces. & De Not. On living branches of *Rosa canina*; Glenfalloch.
- Cryptospora suffusa* (Fr.) Tul. On dead bark of *Alnus rotundifolia*; Glenfalloch.
- Melanconis alni* Tul. On dead bark of *Alnus rotundifolia*; Glenfalloch.
- Diaporthe Wibbei* Ntke. On dead bark of *Myrica Gale*; Caldarvan, Tarbet, Rowardennan, Glenfalloch.

- D. *circumscripta* Otth. On dead bark of *Sambucus nigra*; Glenfalloch.
- Venturia *ilicifolia* Cooke. On dead leaves of *Ilex Aquifolium*; Tarbet.
- V. *myrtilli* Cooke. On dead leaves of *Vaccinium Myrtillus*; Glenfalloch.
- V. *atramentaria* Cooke. On dead leaves of *Vaccinium uliginosum*; Glenfalloch.
- Ditopella *fusispora* De Not. On dead branches of *Alnus rotundifolia*; Glenfalloch.
- Clypeosphaeria *Notarisii* Fckl. On dead branches of *Rubus fruticosus*; Lochlomond (Cooke).
- Ophiobolus *immersus* Trail. On dead stems of *Urtica dioica*; Tarbet (Trail).
- Leptosphaeria *doliolum* (Pers.) De Not. On dead stems of *Urtica dioica*; Tarbet (Trail).
- L. *conoidea* De Not. On dead stems of *Urtica dioica*; Tarbet (Trail).
- Sphaerella *vaccinii* Cooke. On *Vaccinium Myrtillus*; Glen Douglas, Tarbet, Glenfalloch.
- S. *rumicis* (Desm.) Cooke. On *Rumex obtusifolius*; Caldarvan, Rowardennan, Tarbet.
- Phyllosticta *ligustri* Sacc. On *Ligustrum vulgare*; Tarbet (Trail).
- Ph. *destructiva* Desm. On *Menyanthes trifoliata*; Caldarvan.
- Ph. *teucris* Sacc & Speg. On *Teucrium Scorodonia*; Tarbet.
- Phoma *cylindrospora* Desm. On dead leaves of evergreens; Caldarvan.
- Ph. *acuta* Fr. On dead stems of *Urtica dioica*; Tarbet (Trail).
- Actinonema *rosæ* (Lib.) Fr. On living leaves of *Rosa*; Ardlui, Glenfalloch.
- Stagonospora *trifolii* Fautr. On *Trifolium repens*; Balloch.
- Septoria *ribis* Desm. On *Ribes nigrum*; Glenfalloch.
- S. *myricæ* Trail. On fading leaves of *Myrica Gale*; Tarbet, Ardlui, Glenfalloch.
- S. *hyperici* Desm. On *Hypericum pulchrum*; Ardlui, Glenfalloch.
- S. *tormentillæ* Desm. & Rob. On *Potentilla erecta*; Tarbet, Glenfalloch.
- S. *hydrocotyles* Desm. On *Hydrocotyle vulgaris*; Caldarvan, Ardlui.

- S. virgaureæ* Desm. On *Solidago Virgaurea* ; Tarbet.
S. podagrariæ Lasch. On *Ægopodium Podagraria* ; Balloch.
S. lysimachiae West. On *Lysimachia vulgaris* ; Tarbet.
S. menyanthis Desm. On *Menyanthes trifoliata* ; Caldaran.
S. prunellæ Trail. On *Prunella vulgaris* ; Tarbet (Trail).
S. polygonorum Desm. On *Polygonum Hydropiper* and
P. amphibium var. *terrestre* ; Caldaran.
S. plantaginea Pass. On fading leaves of *Plantago lanceolata* ;
Glenfalloch.
S. acetosæ Oud. On *Rumex Acetosa* ; Glenfalloch.
S. urticæ Desm. & Rob. On *Urtica dioica* ; Tarbet (Trail).
S. junci Desm. On *Juncus conglomeratus* ; Caldaran.
Phleospora aceris (Lib.) Sacc. On *Acer Pseudo-platanus* ;
Balloch, Ardlui.
Actinothyrium graminis Kunze. On dead grass ; Glenfalloch.
Leptothyrium alneum (Lév.) Sacc. On *Alnus rotundifolia* ;
Glen Douglas, Tarbet, Glenfalloch.
Melasmia acerina Lév. On *Acer Pseudo-platanus* ; Tarbet,
Ardlui.
M. punctata Sacc. & Roum. On *Acer Pseudo-platanus* ; Balloch,
Tarbet.
Glœosporium curvatum Oud. On *Ribes nigrum* ; Balloch.
G. paradoxum (De Not.) Fekl. On *Hedera Helix* ; Glen Douglas,
Tarbet.
G. pruinatum Baum. On *Veronica Beccabunga* ; Caldaran.
Cylindrosporium ficariæ Berk. On *Ranunculus Ficaria* ;
Glenfalloch.
Melanconium bicolor Nees. On dead bark of *Betula alba* ;
Caldaran, Rowardennan, Glenfalloch.
Septomyxa negundinis Allesch. On bark of recently dead
branches of *Acer Pseudo-platanus* ; Rowardennan.
Steganosporium piriforme (Hoffm.) Corda. On dead bark of
Acer Pseudo-platanus ; Ardlui.
Oidium erysiphoides Fr. On various herbaceous plants ; Glen
Douglas, Tarbet (Trail).
O. leucoconium Desm. On living leaves of *Rosa* ; Glenfalloch.
O. alphitoides Griff. & Maulb. On living leaves of *Quercus*
Robur ; Rowardennan, Tarbet, Ardlui.
Ovularia rufibasis (B. & Br.) Mass. On *Myrica Gale* ; Tarbet,
Ardlui, Glenfalloch.
O. sphaeroidea Sacc. On *Lotus uliginosus* ; Balloch, Caldaran.

- O. veronicæ (Fckl.) Sacc. On *Veronica Chamædrys*; Rowardennan, Tarbet (Trail), Glenfalloch.
- O. obliqua (Cooke) Oud. On *Rumex obtusifolius*; Balloch, Caldarvan, Rowardennan, Tarbet, Ardlui, Glenfalloch.
- Didymaria didyma (Ung.) Schroet. On *Ranunculus repens*; Tarbet (Trail).
- Bostrichonema alpestris Cés. On *Polygonum viviparum*; Glenfalloch.
- Ramularia montana Speg. On *Epilobium montanum*; Glenfalloch.
- R. valerianæ (Speg.) Sacc. On *Valeriana officinalis*; Caldarvan.
- R. knautiæ (Massal.) Bub. On *Scabiosa succisa*; Tarbet.
- R. taraxaci Karst. On *Taraxacum officinale*; Rowardennan.
- R. variabilis Fckl. On *Digitalis purpurea*; Balloch, Rowardennan, Glen Douglas, Ardlui, Glenfalloch.
- R. calcea (Desm.) Sacc. On *Nepeta hederacea*; Glen Douglas.
- R. ajugæ Niessl. On *Ajuga reptans*; Glenfalloch.
- R. plantaginis Ellis & Mart. On *Plantago major*; Tarbet (Trail).
- R. plantaginea Sacc. & Berl. On *Plantago lanceolata*; Glenfalloch.
- R. pratensis Sacc. On *Rumex Acetosa*; Caldarvan, Rowardennan, Tarbet (Trail).
- R. urticæ Cés. On *Urtica dioica*; Tarbet (Trail), Glenfalloch.
- Hormiscium pithyophilum (Nees) Sacc. On bark of *Taxus baccata*; Rossdhu, Inchlonaig (J. Paterson).
- Polythrincium trifolii Kze. & Schm. On *Trifolium repens*; Balloch, Caldarvan.
- Cladosporium herbarum Link. On dead herbaceous foliage; Caldarvan.
- Coniothecium amentacearum Corda. On dead branches of *Salix*; Glen Douglas.
- C. betulinum Corda. On dead branches of *Betula alba*; Glenfalloch.
- Tubercularia vulgaris Tode. On dead branches; Caldarvan, Rowardennan, Glenfalloch.
- Illosporium roseum Mart. On *Parmelia saxatilis*; Ardlui.
- Sclerotium roseum Kneiff. In dead stems of *Juncus conglomeratus*; Caldarvan, Glenfalloch.
- S. durum Pers. On dead herbaceous stems; Glenfalloch.

The Spanish Chestnut (*Castanea sativa*, Miller) in the Clyde Area.

By JOHN RENWICK.

LANARKSHIRE.

THE largest Sweet Chestnut in the neighbourhood of Glasgow is one at Cambusnethan House, Lanarkshire. In May, 1914, it girthed 22 feet 11 $\frac{1}{4}$ inches at 5 feet 6 inches from the ground. It has a bole of 16 feet, and a height, in 1909, of 70 feet. Some time prior to 1900 it was struck by lightning and part of the trunk torn off. A considerable part of the stem has been denuded of bark, and the bare wood is extensively bored. New bark is, however, growing over it, and the tree at each of four measurements, from 1900 to 1914, showed an increase of girth. But withering branches indicate that it is not in vigorous good health. In a paper "On the Old and Remarkable Spanish Chestnuts in Scotland" in the *Transactions of the Highland and Agricultural Society, 1879*, to which I shall have frequent occasion to refer, it is recorded (pp. 64, 65) as girthing 22 feet at 5 feet, 25 feet at 1 foot, and 27 feet at base. It now girths 22 feet 4 inches at 5 feet, 25 feet 11 inches at 1 foot, and 27 feet at base. Evidently part of the trunk has been destroyed by the lightning stroke. This tree is mentioned by William Cobbett in his *Tour in Scotland* in 1832, p. 215:—"A Mr. Lockhart has a most beautiful place, fine woods, trees of great height and girth, where I was shown a Spanish chestnut-tree, twenty-four feet round." It is the only one whose girth he records, although he speaks highly in praise of trees at Ardgowan, Elderslie, Allanton, Dalzell, Mauldslie, and Barncluith.

ARGYLLSHIRE.

A Chestnut, about the same girth, but taller, more widely spread, and in better condition, grows at Ardgartan, Argyllshire, on the delta formed by the detritus brought down by the River Croe. It is only a few feet above sea-level. Indeed, during some severe storms in the winter of 1912-13, when the wind blew

strongly from the south or south-west (up the loch), the water was raised so high at full tide as to surround the tree to the depth of a foot or two. It has a bole of $16\frac{1}{2}$ feet; a girth, in March 1913, of 22 feet 4 inches at 5 feet; a height, in 1899, of 82 feet; and a spread of foliage, in 1903, of 88 feet diameter. Dr. David Christison, in the *Transactions of the Botanical Society of Edinburgh*, Vol. XIX., p. 483 (1892), writes:—"Probably this was the finest and most promising Spanish chestnut in Scotland until a few years ago. In 1867 Sir Robert Christison described it as having a tall, beautiful trunk, without humps, 20 feet in girth at 5 feet up. Unfortunately, a storm in 1875 broke it over, and reduced its height from 100 to 70 feet. He found, nevertheless, in 1877, that the girth had increased 8 inches since 1867, and that the foliage was still dense and healthy."

In June, 1899, I measured a Chestnut in the park at Inveraray Castle, 20 feet 7 inches in girth at 5 feet up. Very likely this is the tree that Mr. R. Hutchison (*l.c.*, pp. 51, 62, 63) records as being 19 feet 4 inches in girth at 5 feet, with a height of 85 feet, in August 1878. In 1862 it was supposed to be 250 years old. He identifies it with one reported in *The Edinburgh Topographical, &c., Magazine* for 1848 as having been 12 feet 6 inches in girth in 1794. If so, I should say that it is not yet quite 250 years old, and may be one of the trees which the Earl of Argyll planted about 1668 to 1684. In 1685 the Marquis of Atholl made a raid into Argyll's country, and, among other booty, carried off about 34,400 trees, whose ages, where given, were from 4 to 16 years. Four hundred were chestnut trees, which were valued at £266 13s. 4d. Scots, or one shilling and twopence sterling each. (*Chronicles of the Atholl Family*, quoted by Mr. Elwes in *Trees of Great Britain and Ireland*, Vol. III., p. 587). Mr. Elwes (*l.c.*, IV., p. 850) writes that it is the largest Chestnut he has seen in Scotland: that there are two fine ones, both over 16 feet in girth, at Ardkinglas, and that Lord Kesteven had informed him that there is one at Stonefield, near Tarbert, 25 feet in girth.

AYRSHIRE.

The largest of twenty-six Chestnuts measured in Ayrshire is one at Kirkmichael House, about four miles from Maybole. I

have not seen it since 1896, when it girthed 18 feet 2 inches at 6 feet 2 inches on low side, 5 feet on high side, bole 11 feet. Mr. Hutchison (*l.c.*, pp. 68, 69) records it as 17 feet at 5 feet, height 40 feet, about 1878, and says:—"Used as game larder for the family 100 years ago. A broad platform still in trunk 10 feet up, and the branches above show traces of the erection." At Newark Castle, within a mile of the Brig o' Doon, is one which in 1907 girthed 17 feet $4\frac{1}{2}$ inches at 4 feet. Height, 45 feet; bole, 10 feet. In the park in front of Eglinton Castle there were formerly many Chestnuts. Of those that remain I have measured eight, the largest being 16 feet $\frac{1}{2}$ -inch in girth, with a height of 62 feet, and bole 16 feet. This is at the narrowest part, and on a very irregular line, avoiding as much as possible the large burrs. Taking the tape straight round at 5 feet up, the girth is 18 feet. The others range from 14 feet 6 inches to 9 feet 9 inches in girth, 76 feet to 55 feet in height, boles 18 feet to 42 feet.

On the estate of Auchincruive, about four miles up the river Ayr, there are, in a plantation called Mount Charles Wood, a number of fine trees which are of especial interest, as the date of planting is known approximately. Mr. R. M-Kay and I measured them in September, 1905, along with the then forester, Mr. George Leven (now in Bowmont Forest), who informed us that they were planted about 1700. He states that one of them, a Scots Pine, blown down in December, 1894, when cut gave within a year or two of 200. In publishing a note of all our measurements taken on that occasion, in *Transactions of the Royal Scottish Arboricultural Society*, Vol. XIX., pp. 212/3, he stated:—"The Scots Pine, Spanish Chestnut, and Beech given in the list form part of what are believed to be the remaining trees (60 to 80 in number) of what has been described as 'the first attempt at systematic planting for the production of timber in Ayrshire . . . in the valley of the Ayr, and the valley of the Doon.' The Spanish Chestnuts in particular are of great size, their contents ranging from 300 to 450 cubic feet, quarter-girth measurement, per tree. Their fruits ripen in average years."

The locality referred to in the valley of the Doon is, Mr. Leven believes, Auchendrane. A Beech and two Scots Pines still growing there probably date to about this time, and a number of Silver Firs were planted in 1707.

A Chestnut at Blair House, Dalry, blown down in December, 1894, had a girth of 14 feet $9\frac{1}{2}$ inches at 8 feet up. Allowing 10 years for it to reach the height of 8 feet, it has been planted about 1709. It is almost certain to be the tree recorded by Aiton in his *View of the Agriculture of the County of Ayr* (1811), p. 338 :—"A *Sweet Chestnut* tree at Blair House is in length from the ground to the first branch 20 feet, and has 16 feet in bole above that. It is 10 feet 8 inches round 3 feet above the ground, 9 feet in girth at 9 feet from the ground, and at 20 feet above the ground is 8 feet in girth." According to the *New Statistical Account* (Vol. V., Ayr, p. 216, June, 1836) it is "believed to be among the largest of the kind in Scotland. It rises with a beautiful stem for upwards of 20 feet. Its girth at the ground is 16 feet 6 inches. Three feet above the ground it is 13 feet 3 inches, and diminishes little to the first branch. It has a fine head of foliage. Although having formerly been nearly surrounded by other trees, its branches have not had full liberty to expand." This, however, accounts for its fine stem. In Loudon's *Arboretum et Fruticetum Britannicum*, Vol. III., p. 2001, it is recorded as 70 feet high, diameter of head 22 feet, of trunk 5 feet, equal to a girth of 15 feet 7 inches, evidently at the ground.

In the grounds of Fullarton, near Troon, are two Chestnuts, girthing respectively 15 feet $3\frac{1}{2}$ inches, bole 13 feet, and 14 feet $8\frac{1}{2}$ inches, bole 7 feet, which suggest interesting associations. William Fullarton, of that ilk, who succeeded to the estate in 1710 and died in 1759, cultivated gardening and botany, particularly the latter, with much assiduity and success. Perhaps he planted these trees and some of the other large specimens on the estate; or they may have been planted by his son William, afterwards Colonel, Fullarton, who succeeded in 1759 and died in 1808, and who was much interested in agriculture. In his 17th year he visited Sicily and Malta in the company of Patrick Brydone, F.R.S., a once celebrated traveller. He is "Brydone's brave ward" in Burns's "The Vision."

Brydone wrote an account of his travels in a series of letters to William Beckford, F.R.S.*

Professor John Walker, D.D., in his "Catalogue of Some of the Most Considerable Trees in Scotland" (*Essays*, p. 29) says—"The great Chesnut which stood at Finhaven, in Forfarshire, was long accounted the largest tree in Scotland." In 1744 it measured, at half-a-foot above the ground, 48 feet 8½ inches. "As it appears to have been planted about 500 years ago, it may be presumed to be the oldest planted tree that is extant or that we have any account of in Scotland." The circumference at the narrowest part of the trunk was 30 feet 7 inches. Mr. R. Hutchison (*l.c.*, p. 50) ascertained that the tree was finally cut down about 1858. Dr. David Christison (*Trans. Bot. Soc. Edin.*, XIX., p. 486) estimated that in 1744 it might possibly be 588 years old, but perhaps not more than four centuries, or even less.

RENFREWSHIRE.

At Erskine House the largest Chestnut measured in girth, in 1893, 14 feet 8½ inches at 4 feet 3 inches, and is probably the tree recorded by Loudon (*Arb. et Frut. Brit.*, III., p. 2001) as 3 feet 2 inches diameter, say 10 feet circumference, no datum line being given, about 1836. The best known Chestnuts in Renfrewshire are two at Auldhouse, just outside the extended boundary of Glasgow. The larger girthed 16 feet 2 inches at 5 feet in 1913, with a height of 60 feet in 1900; the other 15 feet 1½ inches at 4 feet 10 inches, a height of 58 feet, and a spread of foliage of 66½ feet diameter, boles 14 feet. Mr R. Hutchison

* In his sixth letter he gives an account of their visit to "the celebrated tree known by the name of *Il Castagno di Cento Cavalli*, which for some centuries past has been looked on as one of the greatest wonders of Etna." . . . "It does not seem to be one tree, but a bush of five large trees growing together." Examining it with more attention, they found that there was indeed an appearance as if these five trees had really been once united in one. The girth was 204 feet. Another tree, *Il Castagno di Galia*, was a much finer object. It had a solid stem of a considerable height, and girthed 76 feet at 2 feet up. A third, called *Il Castagno del Nave*, was nearly of the same size. Dr. A. Henry (*Trees of Great Britain and Ireland*, IV., 842) says—"This ruin has lately been seen by Mr. Druce, of Oxford, who found four distinct parts still remaining, three of which looked like mighty trees, though not over 70 feet in height. It still fruits freely." Besides this great tree, there are four other enormous trees on Mount Etna 86 feet, 74 feet, 72 feet, 61 feet, in girth, all sound and much more beautiful than it. In our colder northern climate we have nothing at all approaching these wonderful trees.

(*l.c.*, p. 61) writes "these trees may probably have been reared from foreign seeds brought home by monks connected with the adjoining Paisley Abbey, and of whose possessions Auldhouse was a part, and where they had a *coenobitium* or cell." But as the larger tree had a girth of 11 feet 10 inches at 5 feet in 1836, I do not suppose they were planted before 1715, long after the last "hooded monk" had gone to his sleep "beneath the stones of the neighbouring ruined cloister cell." A Chestnut at Castle Semple cut down in 1902 had a girth in 1896 of 15 feet 8½ inches at 4 feet 8 inches, bole 15 feet. About 1862 (*High. and Agric. Soc. Trans.*) it had a height of 63 feet; spread, 66 feet; girth, 13 feet; no datum line. One at Duchall House girthed, in 1907, 15 feet 10 inches at 4 feet 3 inches, bole 10 feet; and one at Hawkhead, in 1906, 14 feet 2½ inches at 5 feet, bole 27 feet. At Finlayston, a tree 11 feet 3¾ inches at 5 feet, in January, 1914, bole 18 feet, height, in 1907, 67 feet, has a number of the leaves of the *heterophylla* type, the only one of this variety I have noticed (*See Trees of Great Britain and Ireland*, IV., p. 840).

DUMBARTONSHIRE.

The largest in this county is at Cordale House, Renton, on the side of the River Leven. In September last it girthed 17 feet at 2 feet 8 inches, with a spread of 66 feet, and a height, in 1911, of 63 feet. It has however, a very short trunk, dividing at 4 feet into two stems, girthing respectively 10 feet 8 inches and 10 feet 7 inches near the divide. Another here is 11 feet 7½ inches at 5 feet, bole 18 feet. Cordale has associations with Thomas Campbell, and with Professor Sir William Hamilton and his brother Thomas. The poet spent much of his time here in 1797 and wrote various lyrics, including "The Wounded Hussar," which at once became popular in Glasgow, was sung on the streets, and soon spread over the country. The brothers Hamilton in their boyhood—about 1799 to 1801—resided here part of the year.

In the celebrated triple avenue at the Clachan House, Rosneath, are several Chestnuts, the largest girthing 13 feet 10 inches in 1908. There is a fine one on the roadside near Arnburn, three miles south of Luss, with a girth, in 1905, of 14 feet 4 inches. It is to be hoped that road improvement will not call for its

removal. Professor Walker, after describing the Finhaven tree, continues, "There was a Chesnut also of surprising bulk at Levenside in Dumbartonshire. It was overthrown by the hurricane on 13th January, 1739, but its precise dimensions have not been preserved." Levenside is now called Strathleven.

BUTESHIRE.

At Mount Stuart, in Bute, I measured, in 1903, with Mr. James Kay, the forester, a Chestnut, girth 13 feet 9 inches at 5 feet, bole 22 feet, which he told me was planted in 1712.*

STIRLINGSHIRE.

In the policies of Buchanan Castle, which are in that part of Stirlingshire embraced in the Clyde Area, there is a very large Chestnut. In 1900 it girthed 18 feet 6 inches at 2 feet 8 inches, the narrowest part of a short bole of 8 feet, but the weight of the two large stems into which it divides had evidently split the trunk, which showed a fissure.

HEIGHTS.

I have taken the heights of only nineteen trees, the highest being 85 feet and 81 feet at Loudoun Castle; 82 feet at Ardgartan; 76, 70, 67 feet (and under) at Eglinton Castle; 70 feet at Cambusnethan House; and 78 feet and 76 feet at Kilkerran (per Mr. James Maxwell).

SPREAD.

For spread of foliage, worthy of note are those at Ardgartan 87½ feet, Auldhouse 66½ feet, Cordale House 66 feet diameter.

GIRTH-INCREASE AND PROBABLE AGE.

With regard to the annual rate of girth increase, it is very interesting to have that of the whole period of life of the three trees at Auchencruive and of the one at Mount Stuart. The former give .92 of an inch, .90 and .86 for 207 years, supposing they were planted in 1700 and had attained a height of 5 feet

* A Chestnut, at Kames Castle, measured, in February, 1915, 12 feet 6 inches at 5 feet, bole 18 feet. According to Mr. Kay, it was probably planted about 1718, and had a height, in 1911, of 68 feet.

in seven years. The largest was measured in 1905 as well as in 1914, the rate for the last nine years being $\cdot44$ inch, and for the first 198 years nearly $\cdot95$ inch annually. The Bute tree shows $\cdot89$ inch for $(191-7 =)$ 184 years, but from Mr. Kay's figures the rate for 40 years, 1871-1911, was $\cdot71$ inch. On the occasion of the Society's visit to Tynninghame, in 1896, we measured a Chestnut which Lord Haddington informed us was planted in 1706. The girth at 5 feet was 14 feet $5\frac{1}{2}$ inches, the rate for 183 years' growth being thus $\cdot95$ inch annually, which is the same as that of the largest Auchencruive tree for a longer period, and seems to indicate that the western tree has grown rather more than the eastern one. If it is the same as one recorded in Mr. Hutchison's table (*l.c.* page 87) as 13 feet 6 inches in 1878, the rate between 1878 and 1896 was $\cdot74$ inch. As a rule, the older a tree becomes the slower is the rate of growth. The Blair House tree, for its whole life of 175 years, showed an average rate of 1.01 inches at 8 feet up. In 1810 it would have a girth of about 9 feet 3 inches, the rate for the first 91 years being 1.22 inches, and for the next 84 years $\cdot78$. Suppose it was 3 feet high in 1714, the rate at this point for the first 96 years was 1.33 inches, and for the next 25 years 1.24 inches. The Ardgartan tree showed an average annual rate of—

$\cdot80$	inch	for	10	years	from	1867-1877.
$\cdot61$	„	22	„			1877-1899.
$\cdot49$	„	14	„			1899-1913.

A younger tree there gives for $9\frac{1}{2}$ years 1.09 inches annually at 3 feet up, the girth being taken at this point as a branch had been cut off at 5 feet. Dr. Walker in his catalogue records two Chestnuts at Roebank, Midlothian, planted 1729, which girthed in July, 1761, 5 feet 4 inches at 4 feet—the rate for 32 years being thus 2 inches annually; and one at Lochnell, Argyllshire, 36 years old in July, 1771, girth at 4 feet, 5 feet = rate 1.66 inches yearly. If five years have to be allowed for them to attain to the height of 4 feet, the rates are 2.37 inches and 1.93 inches respectively.

Taking the Inveraray tree measured in 1899 as the same that is recorded for 1794, it has increased during these 105 years at the annual average rate of $\cdot91$ inch, and for the 21 years 1878-1899 at $\cdot74$ inch. A young tree at Buchanan Castle, Stirlingshire, planted 1865, had in 1900 a girth of 5 feet $5\frac{1}{4}$ inches at

2 feet 6 inches up, a rate of 1·86 inch for 35 years, or 2·04 inch for 32 years. On the supposition that the Inveraray tree was planted in 1688 it was about 30 years old when the Auchincruive trees were planted, and, at the rate of the Buchanan Castle tree, its girth would then be about 5 feet. Now, in 1899, it would be about 5 feet 3 inches, 5 feet 7 inches, and 6 feet 7 inches greater than the three Ayrshire trees, so that 1668 seems a very likely date for it.*

The Ardgartan tree may be about the same age. In 1899 it was 14 inches larger than the Inveraray one, but probably it has grown faster; it has good soil and favourable surroundings, though perhaps there is not much to choose between the two localities. Dr. R. Christison (*Trans. Bot. Soc. Edin.*, XIX., p. 486) estimated that in 1879 the least possible age was 188 years, equal to being planted in 1691. The larger of two Chestnuts at Ardgowan, Renfrewshire, increased—

1·12 inch annually for 10 years, April, 1894, to May, 1904.

1·07 " " 11 " May, 1904, to Sept., 1914.

One at Rosneath, Dumbartonshire, increased ·83 inch for 9 years, April, 1895, to September, 1903; and ·81 for the next $4\frac{1}{4}$ seasons.

A very fine one at Kilkerran, Ayrshire, with a beautiful trunk 36 feet long, increased at the rate of 1·19 inches annually for 4 years between our first and second visits (1904 and 1908), and at 1·17 inches during the next $4\frac{1}{2}$ growing seasons. The larger tree at Auldhouse, on the city border, from recorded measurements, showed an average of—

1·09 inches annually for 22 years, 1836-1858;

1·05 " " 19 " 1858-1877;

but only ·33 " " 22 " 1892-1913.

* Since writing the foregoing I find it stated, in the *New Statistical Account*, that a Spanish Chestnut at Inveraray, planted in 1674, measured in 1798, 12 feet 6 inches. If this is the same tree the figures have been—

Period.	Girth. Ft. In.	Increase. Ft. In.	Years.	Rate. In.
1674, say 1679 to 1798,	12 6	12 6	119	1·26
1798 to 1878,	19 4	6 10	80	1·02
Aug., 1878, to June, 1899,	20 7	1 3	20·4	·74
		20 7	219·4	1·12
1798-1899, - - - - -	...	8 1	100·4	·96

The very low rate recently is undoubtedly in great part due to the increasing amount of smoke that in these later years the tree has had to contend with, as domestic and industrial chimneys have crept nearer it, but the greater age is a large factor. In 1836 the girth was given as 11 feet 10 inches. With a rate of 1.09 inches for the following 22 years it is almost certain to have averaged more than 1.20 inches for the preceding part of its life. If it reached 1.40 inches the tree would be about 100 years old then, or about 180 now, and the date of planting may be guessed as between 1720 and 1735.

The larger trees at Eglinton Castle, Ayrshire, were probably planted by Alexander, 10th Earl (1723-1769), some time between 1740 and 1769. Doubtless they were in existence in 1773 when his mother Susanna, "the beautiful Countess" (1689-1780), was visited at Auchans by Dr. Samuel Johnson and Mr. James Boswell. The distinguished traveller, who had seen "rising forests" at Inveraray, and landed on one island (Inch Lonaig) in Lochlomond, planted with yew, records that Auchinleck, the estate of Boswell's father, "was with the rest of the country generally naked till the present possessour, finding by the growth of some stately trees near his old castle that the ground was favourable enough to timber, adorned it very diligently with annual plantations." But as, according to the complaint of the Dowager-Countess of Loudoun, "he didna see" her elms at Sorn Castle, it is not likely that, though he had seen the Chestnuts and Beeches at Eglinton Castle, he would have altered his verdict as to the general absence of trees in Scotland.

The Rev. Dr. D. Landsborough in 1879 measured a Chestnut at Fullarton House, Ayrshire, 12 feet 5 inches in girth, which is apparently the one that was 14 feet 8½ inches in 1903. The rate between these two dates is 1.12 inches per annum, while between 1903 and 1914 it was .62 inch. An average rate of 1.20 inches previous to 1879 would bring us to 1753, and we may imagine the botanist, William Fullarton, planted the tree on the occasion of the birth of his son. But it is quite probable that it grew at a greater rate (say 1.40 inches), and we may make the interesting supposition that the traveller, William Fullarton, brought home nuts from the immense trees which he visited on

the slopes of Mount Etna, and that this tree is a descendant of one of these! A Chestnut at Dougalston, Dumbartonshire, increased—

from March, 1893, to May, 1900, fully 7 years, at rate of	·56 in.
„ May, 1900, to Sept., 1913, nearly 14 „ „	·36 in.
<u>21 years.</u>	<u>·43 in.</u>

The large tree at Cambusnethan House, Lanarkshire, increased—

from May, 1900, to May, 1902, fully 2 years, at rate of	·74 in.
„ „ 1902, to June, 1909, fully 7 „ „	·57 in.
„ June, 1909, to May, 1914, nearly 5 „ „	·56 in.

Two years is too short a time for a definite conclusion, but the indications are that the rate is decreasing. Taking into account the loss by lightning, this tree is possibly older than those at Ardgartan and Inveraray. The manor-house and adjoining lands of Cambusnethan were bought in 1661 by Sir John Harper, Sheriff-Depute of Lanarkshire. He took down an old square tower of four storeys, built by Sir Robert Baird in the time of King Robert Bruce, and the buildings which succeeding Barons had clustered round it, and erected “a stately mansion, which, after standing for about 160 years, was unfortunately burnt down” (P. Brown: *The Parish of Cambusnethan*).

It is not at all unlikely that the old tree was planted by the Sheriff after the building of the house.

A few other examples may be given, although the trees do not belong to the Clyde Area. In June, 1891, we measured, with the late Col. Stirling, a Chestnut on his grounds at Gargunnoch House, Stirlingshire, which girthed 20 feet at the narrowest part of the stem. From a record of previous measurements supplied by him I find the increase has been :—

October, 1848, to July, 1868, 19·6 years—	1·22 inches a year.
July, 1868, to September, 1881, 13·4 „	·93 inch „
Sept., 1881, to June, 1891, 10·2 „	·54 „ „

43·2 years

Another Chestnut there which girthed 14 feet $9\frac{1}{2}$ inches at 3 feet in 1881, showed a rate of :—

1·04	-	-	for 19·6 years.
·70	-	-	,, 13·4 ,,
			33 years.

At Newbattle Abbey, Midlothian, on the occasion of a Society visit, on 4th July, 1896, we measured two Chestnuts, one girthing 18 feet 1 inch at 5 feet, bole 16 feet; the other 16 feet 10 inches at 5 feet. The former was measured by Dr. Walker on 6th July, 1789, 11 feet 9 inches at 4 feet. He remarks it “still appears young and vigorous.” Mr. Hutchison (*l.c.*, page 51) records that on 24th August, 1877, it girthed 17 feet 10 inches at 4 feet, and 17 feet 4 inches at 5 feet. The increase between 1789 and 1877 was 6 feet 1 inch at 4 feet, an average rate of over ·82 inch annually for $88\frac{1}{2}$ years; between 1877 and 1896, 9 inches, a rate of nearly ·49 for $18\frac{1}{2}$ years. On the island of Inchmahome in the Lake of Menteith, Perthshire, we measured in April 1890, three Chestnuts 16 feet $9\frac{1}{2}$ inches, 14 feet 7 inches, and 11 feet 5 inches. Measurements recorded by Mr. Hutchison (*l.c.*, pp. 58 and 65) appear to show that in 1876 two of these girthed 16 feet 6 inches and 14 feet 2 inches, the rate for, say, $13\frac{1}{2}$ years being thus ·26 inch and ·37 inch.

SPANISH CHESTNUTS RIPENING IN SCOTLAND.

Professor A. Henry, Dublin, suggested that I should verify statements as to the fruit of Sweet Chestnut ripening in Scotland and called my attention to two such records in *The Gardeners' Chronicle* for 1881. He stated it rarely produces good fruit in Ireland, except in favoured spots—well in County Wexford; rarely well in Wicklow, still good fruit in odd years. To my inquiry Mr. George Leven replied: “There can be no doubt as to the fruits of the Spanish Chestnut ripening at Auchincruive, as I have gathered hundreds of almost as good quality and size as those from abroad. I have raised one or two seedlings, and I think James Hamilton has still one growing in his garden that he raised from seed. Mr. Oswald used to gather them for eating and he will be able to bear me out. . . . There was one particular Spanish Chestnut that formed edible fruit oftener

than any of the others. Some never produced ripened seed. The position at Auchincruive is extremely favourable as regards coast shelter, and is of course well south-west. Certain things where they get above the frost zone grow almost as well as at Castle Kennedy. . . . It may be of interest to know that they also ripen at Floors Castle as I gathered large fruits in 1911, a good year, under one of the trees you must have measured on your visit in 1893." These trees girthed respectively 15 feet 11½ inches at 4 feet 3 inches, and 15 feet 5½ inches at 4 feet 6 inches in 1893. He sent me two of the fruits, good size, measuring respectively about 1¾ by 1½ by 1 inch, and 1¾ by 1¾ by 1½ inches.

Mr. George Smith, estate agent, Auchincruive, writes: "It is quite the case that the fruit of the Chestnut frequently ripens here, and such could have been gathered last year, and also in 1911. The seedling which Mr. Leven refers to unfortunately met with an accident after it was about 2 feet high. Some horses in an adjoining field had reached over the garden fence and pulled up and destroyed the plant."

The notices in *The Gardeners' Chronicle* are (1st) Vol. XVI., p. 202, 12th February, 1881, in an article, "A Scotch Improver," [Lord Kames at Blair-Drummond] "A Spanish Chestnut 45 feet high, with a trunk of 7 feet 2 inches, is the offspring of seed ripened in this park in the hot season of 1826, since which time very little chestnut seed has ripened here." (2nd) Vol. XVI., p. 340, 12th March, 1881. . . . "Spanish Chestnut raised from seed ripened in 1826. I measured some we have growing here raised from seeds ripened the same year, the largest of which are 6 feet 10 inches and 5 feet 10 inches respectively, which is rather less than the one at Blair-Drummond, but ours have not been favourably situated, being surrounded by large old trees. I believe the Spanish Chestnut has never ripened seed here since 1826.—PETER WHITTON, METHVEN CASTLE, PERTH."—The son of the author of this note is our Superintendent of Parks, Mr. James Whitton. At my request he wrote to Col. Smythe of Methven Castle, who kindly replied: "Thomas Bishop, in his MS. notes of trees at Methven, says, 'The few Spanish Chestnut trees planted on the north side of the east approach eastward of the

Weeping Birch in the corner of the Drumbank Park, were raised from seed picked up in the year 1826, from the produce of trees near the Pepperwell Oak, perhaps the only season in which they had ever produced ripened seeds' [Bishop died in 1851]. There are three of these trees still remaining, but one has never done well and is gradually going back. The other two are both about 55 feet high. Their girth at 4 feet is respectively 8 feet 3 inches and 8 feet 8 inches. The parent trees are about 80 feet high, and 13 feet 2 inches in girth at 4 feet. I have many times tried to get ripe seed from these trees but have never done so. About 20 years ago there was a hot summer and seed formed to a certain extent, but none came up of the seed I planted. Two years ago I was told that on the road between Crieff and Comrie there were lots of ripened Chestnuts, but those here did not do more than form, and last year, notwithstanding the hot summer, they were no better, so I am inclined to think Thomas Bishop was right when he said 1826 was the only season they have produced ripened seeds."

The year 1826 was a most exceptional one. Sir Robert Christison, in his *Autobiography* (p. 346), says: "The spring and summer seasons of that year were remarkable for the extraordinary drought and heat which prevailed for many continuous months. The fine weather set in with the beginning of March, and continued with scarcely a check well into the autumn." The grain was good, but the straw deficient, and in some places it was cut with scissors. The year was long remembered as "the year of the short corn."

In the *New Statistical Account of Scotland*, Renfrewshire, p. 506*, it is stated "there are also in the woods near Erskine some fine old walnut and sweet chestnut trees, the latter producing in dry and favourable seasons fruit which may vie in quality, if not in size, with the famed chestnuts of Spain."

Mr John Gloag, long resident on the Loudoun estate, Ayrshire, informs me that "there is one tree near the Castle which in most averagely good years bears well-ripened fruit of fair size." He has never known any of the nuts to be planted, but has not the least doubt they would have grown had they been sown. Nor has he seen any self-sown seedlings, but the nimble squirrel and

the prolific rabbit are too much in evidence to permit them growing. In Eglinton Park last November I saw many chestnuts newly fallen from the trees, but only four days later not a single nut could be found. At Rozelle, near Ayr, in favourable seasons chestnuts of a fair size and quite edible, have been gathered, I am told.

It may be noted that the Methven trees show clearly the higher rate of girth-increase in youth. Assuming that they had reached the height of 4 feet by 1832 the figures are:—

No. 1.				
Period.	Girth.	Increase.	Years.	Rate.
	Ft. In.	Ft. In.		In.
(1826 say)—1832 to 1881,	6 10	6 10	49	1·67
1881 to 1915,	8 8	1 10	34	·65
		—————	—	—————
		8 8	83	1·25
		=====	==	=====
No. 2.				
1832 to 1881,	5 10	5 10	49	1·22
1881 to 1915,	8 3	2 5	34	·85
		—————	—	—————
		8 3	83	1·18
		=====	==	=====

The larger tree, which had at first grown the faster of the two, is now the slower.

For further details of trees in the Clyde Area reference may be made to the tables given in the next part of this Journal.

Excursion.

BENMORE, HOLY LOCH, 27th June, 1914.—Conductor, Mr. John Paterson. Ten gentlemen turned out to this excursion which was carried out in fine weather. The district visited is naturally romantic and beautiful, and full of interest to naturalists. Much art has been employed about Benmore to “mend nature,” and the attention of those present was largely concentrated on the remarkable collection of shrubs and trees which has been brought together there. Mr. John Cairns, who was with the party, got in touch with Mr. Greenlaw, the gardener, and to both of these gentlemen, in different ways, all present

were much indebted. A few of the shrubs and trees which excited interest may be mentioned:—the Snowdrop or Silver-Bell tree (*Halesia tetraptera*), the Judas tree (*Cercis Siliquastrum*), a fine Thorn of garden origin (*Crataegus Carrierei*), the Cherry known as *Prunus Avium juliana pendula*, the Potato tree (*Solanum crispum*) which was in flower, the Japanese “Kiri” (*Paulownia imperialis*), a very much admired Californian currant (*Ribes speciosum*), and that *Pittosporum* so commonly cultivated in the north-east of Ireland, just across from the Firth of Clyde where it is very little seen. The gardener drew attention to a disease affecting his apple trees. Regarding this, Mr. D. A. Boyd writes:—The dark brown flocculent growth on the apple leaf is caused by *Fusicladium dendriticum*, a parasitic brown mould. It often causes much loss to fruit-growers by disfiguring apples so as to render them unmarketable. Masee recommends removal of the diseased shoots in early spring. “These,” he says, “are readily recognised by the much injured bark or skin which is frequently torn into shreds, more especially near the base of the last year’s shoot. At this period of the year the exposed blackish patches are densely covered with the *Fusicladium* form of fruit, which is carried by wind, rain, etc., on to the young leaves, which become infected.” The affected apples become cracked, scabbed, and disfigured. A leaflet (No. 131) dealing with this pest has been issued by the Board of Agriculture and Fisheries. It is doubtful if there is a district easily accessible from Glasgow where a greater variety of the Coniferæ can be seen on such a large scale as on the way from Benmore to Kilmun by the road that comes from Loch Eck. Some interesting deciduous trees may also be seen here; and it was noted that *Cotoneaster frigida*, a handsome species, was springing up spontaneously in a number of places.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VII., No. 2.]

[June, 1915.

A Contribution to the Parasitic Fauna of the West of Scotland.

By JOHN RITCHIE, Jun., Beith.

[Read 27th April, 1915.]

THE following parasites, with their respective hosts, have all been obtained within a radius of four miles from Beith in North Ayrshire.

The observations were carried out in my spare time during the last five or six years.

I am indebted to some of our local gamekeepers and to Mr. R. Kennedy, who supplied me with specimens, also to Dr. Jas. Johnstone of Liverpool and Mr. Elmhirst of Millport for their assistance in kindly granting me the use of original papers and help in identifying some of the species.

In many cases the species have several synonyms. I have for the most part followed Dr. Max Lühe's register, given in "Die Susswasserfauna Deutschlands" series, with one or two exceptions where I have followed Dr. Wm. Nicoll.

PLANARIA GONOCEPHALA (Dugès).

INFUSORIAN.

Trichodina steinii (C. & L.).

I found this Epizoid infusorian on almost every one of the forty specimens of the above planarian I examined.

GAMMARUS PULEX (L.).

ACANTHOCEPHALA.

Polymorphus minutus (Gze.)

This parasite, in its larval form, was quite common in the months of January and February, and was found encysted in *Gammarus pulex*.

ROTIFERS.

Embata (Callidina) parasitica (Giglioli).

Among the appendages of every *Gammarus* I examined last winter I found this parasite.

THE TROUT (*Salmo fario*).

TREMATODES.

Bunodera luciopercae (O. F. Müll.).

From the intestine; only observed in one trout, from which I obtained several examples.

Stephanophiala laureata (Zeder).*

In the intestine; one host examined in July contained thirty-two mature specimens of this parasite, scattered throughout the length of the intestine.

ACANTHOCEPHALA.

Echinorhynchus truttae Schrank.*Acanthocephalus lucii* (Müll.).

Both the above are from the intestine and are fairly common.

Neorhynchus rutili (Müll.).

From the intestine. I only met with this parasite on one occasion, and then in the gut of a small burn-trout about five inches long.

* Nicoll, W. On Classification of Digenetic Trematodes. *Quar. Jour. Micro. Science*, Vol. LIII., 1909.

CRUSTACEA.

Argulus foliaceus (Lin.).

Ecto-parasite.*

THE STICKLEBACK (*Gasterosteus aculeatus*).

TREMATODES.

I observed one species of *Distome*, which I lost in the process of preserving.

ACANTHOCEPHALA.

Neorhynchus rutili (Müll.).

From the intestine. This species is common.

CESTODES.

Schistocephalus gasterostei (Fabr.).†

From the abdominal cavity. In one specimen the worm, in making its escape, had ruptured both the body wall and the vent. In August, 1913, in a small stream which flows into the Beith Water Dam, I observed that the sticklebacks had a very baggy appearance. I caught twenty of them, and in fifteen this parasite was found.

CRUSTACEA.

Argulus foliaceus (Lin.).‡

THE LOACH (*Nemachilus barbatula*).

TREMATODES.

On dissecting the head of a loach last summer, I got a *Trematode* in the Cercaria stage. I am sorry that I did not observe whether it was in the nasal cavity or the brain cavity, but it was in one of them.

ACANTHOCEPHALA.

Neorhynchus rutili (Müll.).

From the intestine. Common in the loaches of some streams and not common in those of others.

* *The Glasgow Naturalist*, Vol. VI., pages 97 and 98.

† For other record see *The Glasgow Naturalist*, Vol. II., pp. 6-12.

‡ *The Glasgow Naturalist*, Vol. VI., page 98.

NEMATODES.

There were several species, mostly immature specimens, which I was not able to identify.

THE MINNOW (*Phoxinus aphyia*).

In July and August, 1913, I examined about a hundred minnows from the Maich Burn, and found no parasites in any of them; their alimentary canal was filled in almost every case with an alga of the *Spirogyra* type.

THE FROG (*Rana temporaria*).

TREMATODES.

Gorgoderia cygnoides (Zed.).

From the bladder. I have obtained this species oftenest between the end of March and June; the largest number I ever got in one frog was five. In one frog I obtained two specimens in the company of two specimens of *Polystomum integerrimum*.

Polystomum integerrimum (Fröl.).

From the bladder. This type is common, although in only two cases have I met with individuals bearing ova. In both cases it was at the season when frogs leave their winter quarters to spawn.

Haplometra cylindracea (Zed.).

From the lung. Very common; usually there is a number in each lung, sometimes as many as nine. Their alimentary canal is distended with the blood corpuscles of the frog. I have kept them alive for several days in water, where they gradually shed both their ova and the contents of their alimentary canals. I have on several occasions obtained immature specimens in various stages. On one occasion I obtained two immature individuals in coition; Cobbold, in his *Entozoa* (1864), pages 22 and 31, draws attention to coition between two *Distoma conjunctum*. These two specimens measure .5 mm. in length. Unfortunately, the preparations do not bring out all of their

anatomical details, but are sufficiently clear to be recognised as being in coition. On another occasion, in a lung infested with this parasite, I obtained the nematode worm, *Angiostomum nigrovenosum* (Rud.).

Pleurogenes claviger (Rud.).

From the large intestine; not common, as I only got it on one occasion when there were four mature specimens in one host.

Opisthioglyphe rastellus (Olss.).

From the large intestine. I got two specimens of this in the summer of 1912. The specimens were fully 4 mm. in length.

ACANTHOCEPHALA.

Acanthocephalus ranae (Schrank).

From the intestine. This is very common in the frogs in higher parts of this district.*

NEMATODES.

This type of parasite is very common, there being several genera represented. I have found among them *Nematoxys*, *Strongylus auricularis* (Zed.), *Heterakis*, and others. On one occasion I found a very small nematode in the gall bladder, which I lost after a preliminary examination of it. My knowledge of nematodes is not sufficient to warrant my naming many of the specimens in this group; however, I took *Angiostomum nigrovenosum* (Rud.) on one occasion from the lung of the frog (*see above*).

I might note here that, through the kindness of a friend, I received a frog (alive) from Nevada, U.S.A., last summer. In its lungs I obtained several specimens of *Pneumonaces variegatus* (Rud.), and from its intestine I took four specimens of a larval tape-worm not sufficiently matured to identify.

THE TOAD (*Bufo vulgaris*).

ACANTHOCEPHALA.

Acanthocephalus ranae (Schrank).

From the intestine, being fairly common.

* *The Glasgow Naturalist*, Vol. IV., page 89.

NEMATODES.

Angiostomum nigrovenosum (Rud.).

Is fairly common in the lungs. There are also several nematodes in the intestine.

THE PALMATE NEWT (*Molge palmata*).

Acanthocephalus ranae (Schrank).

From the intestine. This species is met with in almost all the specimens I have examined; in several dead newts I have observed that the intestine is often torn by this parasite. This, I have no doubt, caused the death of the host.

NEMATODES.

Several species have been observed; one, a mature *Ascaris* (female), measured 9 mm. in length; it had the characteristic alae, which were .15 mm. in length. The breadth of the body was .15 mm. at its widest part.

THE BLACK-HEADED GULL (*Larus ridibundus*).

TREMATODES.

Strigea variegata (Crepl.).

From the large intestine.

CESTODES.

Parachoanotaenia porosa (Rud.) (?)

Small intestine; fully mature in January. The genital apertures in one of my specimens were not always alternate, but were on the same side in adjacent segments.

Hymenolepis fusus (Krabbe).

THE HERRING GULL (*Larus argentatus*).

A single specimen got in March, 1915.

TREMATODES.

Gymnophallus deliciosus (Ols.).

From the gall-bladder. I obtained twenty-four in one bladder, all being mature.

Parorchis acanthus (Nicoll).*

From the rectum I obtained three specimens, all in a mature condition, one of the specimens I measured being slightly longer than 5 mm.

NEMATODES.

In the stomach there was a very large number of nematodes, of a red colour, which I could not identify

CESTODES.

A single tape-worm from the small intestine, which I have not yet identified.

COMMON SNIPE (*Gallinago caelestis*).

CESTODES.

A tape-worm from the intestine, but as there was no head obtained I could not identify it.

THE WIGEON (*Mareca penelope*).

A single specimen got in December, 1914.

TREMATODES.

Catatropis verrucosa (Fröl.).

From the Cæca and the adjoining part of the intestine I got several examples, which varied greatly both in their length and breadth.

ACANTHOCEPHALA.

Polymorphus minutus (Gze.).

From the lower part of the intestine I obtained six specimens; there may have been more examples which I overlooked in examining the rest of the intestine, as it was the first occasion I had of seeing this parasite, and I would have missed it, but at an empty part of the gut I was attracted by the appearance of small red globules, which on examination proved to be this worm. I have since got its larval stage in *Gammarus pulex*.

* "*Parorchis acanthus*" in *Quar. Jour. Micro. Science*, Vol. LI., 1907.
Also in "Some New and Little Known Trematodes," *Ann. and Mag. of Nat. Hist.*, Ser. 7., Vol. 20, 1906.

CESTODES.

Three different species of *Hymenolepis*.

THE LONG-EARED OWL (*Asio otus*).

NEMATODES.

There were several of this family, of one type, in the intestine.

STARLING (*Sturnus vulgaris*).

CESTODES.

Tenia undulata (Rud.) from the rectum.

THE SWALLOW (*Hirundo rustica*).

TREMATODES.

Plagiorchis maculosus (Rud.).

From the small intestine.

Eumegacetes contribulans, M. Brn.

From the cloaca.

THE WILLOW WREN (*Phylloscopus trochilus*).

CESTODES.

There were two different species, but as I did not obtain the heads I was not able to identify them.

Among the birds I have examined without obtaining any parasites are the Redpole (*Linota rufescens*) (12) and the Moor-hen (*Gallinula chloropus*) (5).

HORSE (*Equus*).

NEMATODES.

Ascaris megalocephala.

Common in the faeces of the horse.

SHEEP (*Ovis*).

TREMATODES.

Fasciola hepatica (Lin.).

This is very common in the liver; in one liver examined there were over three hundred specimens; the gall-bladder being full of ova, distended, and quite hard.

RABBIT (*Lepus cuniculus*).

TREMATODES.

Fasciola hepatica.

From the liver. Only obtained on one occasion.

CESTODES.

A larval form in the jaw; the cyst, containing numerous examples, measured about an inch in diameter.

HARE (*Lepus timidus*).

NEMATODES.

Numerous examples of a reddish-brown worm, about half-inch long, were found in a stomach.

FIELD VOLE (*Microtus agrestis*).

NEMATODE.

Several specimens of one species of nematode from the intestine.

DOMESTIC CAT (*Felis*).

NEMATODES.

Ascaris mystax (Rud.).

From the whole length of the alimentary canal, common.

CESTODES.

Tænia elliptica (Batsch).

Common in the intestine.

THE STOAT (*Mustela erminea* (L.)).

I have only examined one specimen, in January, and did not find any parasites in it.

MOLE (*Talpa europæa*).

CESTODES.

Tenia filamentosa (Barroch).

From the intestine; fairly common. It was quite a common occurrence to procure specimens of a flea (*Pulex*) among the hair, and on one occasion I got a tick.

HEDGEHOG (*Erinaceus europæus*).

NEMATODES.

From the intestine, three different species. From the lungs, I obtained from one lung two hundred examples (not the whole of them) of a small slender *Strongyle*.

It will be noticed that in this list I have not named many of the nematodes. The reason for this is that my knowledge of this group is very deficient, and so far I have not come across any satisfactory memoir of the group.

Faunistic Notes.

I.—Habits of *Cottus bubalis*. II.—Records of *Lernæa cyclopterina*, *Abnormal Anas boscas*, *Colymbus arcticus*, *Tetrabothrius macrocephalus*, and *Parachordodes violaceus*.

By RICHARD ELMHIRST, F.L.S., Superintendent of the Millport Marine Biological Station.

[Read 30th March, 1915.]

I.—HABITS OF *COTTUS BUBALIS*, EUPHRASEN.

This species is common in the Laminarian zone all round our coasts; its success is evidently due to the fitness of its adaptations, both of form and colour, to the particular needs of its mode of life. In form it has departed considerably from the spindle-shape which is characteristic of the more typical Teleosteans of free-swimming or Nektonic habits. The large blunt head while tending to obviate the possibility of straight speed, which is obviously useless in the forests of tangleweed, allows the presence of the very wide gape necessary for the capture of active prey in confined surroundings. The large size of the fins, however, enables a short very rapid dart to be made for this purpose, and the large pectorals are also eminently useful, when held erect, for stopping as suddenly. The angular shape of the head and the conformation of the fins together produce a very irregular outline which is a useful device for securing invisibility. Add to this the power of changing colour according to surroundings,* and it is easy to realise how extremely well the species *Cottus bubalis* is fitted for lurking in the dense seaweed forests of the Laminarian zone well hidden from enemies, and capable of such short, sharp, snapping movements as are necessary for the capture of the various Gammarids, &c., on which it feeds.

The closely related species *Cottus scorpius* is very similar in structure and habits, but there are one or two points in which

* CUNNINGHAM, J. T., *Colour changes in Cottus bubalis*, Journal, M.B.A., N.S. Vol. I., pp. 458-9.

C. bubalis seems to be more specialized than *C. scorpius*. *C. bubalis* has several small filamentous outgrowths of skin about the head which are absent in *C. scorpius*, and which serve to increase the irregularity of outline by a method carried to great perfection in *Lophius piscatorius*, which has "numerous filaments having fringed edges round the lateral margin of the body."* In *C. bubalis* there are "a few small tentacles about the head and above the eyes, and usually one at the end of the maxilla."† On looking over a number of specimens I find there is a distinct difference between the maxillary tentacles of the two sexes. In normally sized specimens 10-11 cm. long, the maxillary tentacle is about 3 mm. long and tends to become pinnate along the posterior margin (Fig. 1) in the male; in the female it is shorter and regular, and only half the length of the male's, and in addition there is a smaller tentacle, almost in the angle of the lips, which points forward and which is altogether absent or only occasionally represented by a small knob in the male. Just above the eye, in both sexes, there is an irregular ridge of several small knobs and tentacles, which are more distinct in the male than in the female; the largest central filament may be 2 mm. long (Fig. 3).

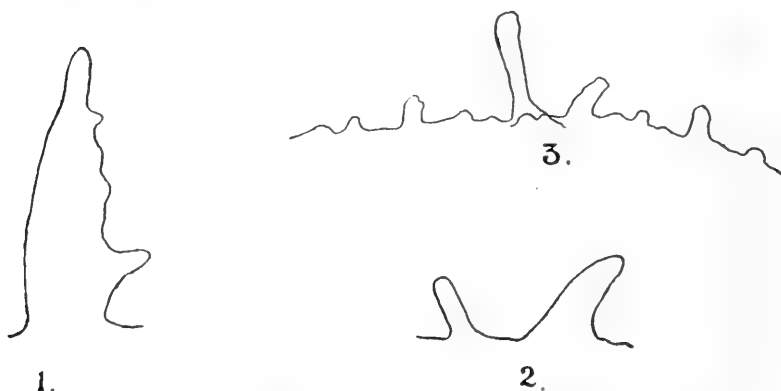


Fig. 1.—Maxillary tentacle of male *C. bubalis*.

Fig. 2.—Maxillary tentacles of female *C. bubalis*.

Fig. 3.—Upper margin of the eye male *C. bubalis*.

* DAY, F., *The Fishes of Great Britain and Ireland*, Vol. I., p. 74, 1880-4.

† *Ibid.*, p. 52.

The colours of the male in both *C. bubalis* and *C. scorpius* become very bright during the breeding season,* and the males of both species display before the females. Several years ago I had in the aquarium a male *C. scorpius* of a beautiful pinkish red colour, exactly the shade of *Melobesia*, which in spring assumed numerous bright yellow and white spots and bars on the abdomen and pectoral fins. I saw this male display before a female. The colours of the male were glowing brilliantly, he jumped and turned about excitedly in front of the female, repeatedly stopped, erected and twitched his fins thus displaying his colours to perfection; the rapidity of the respiratory act and his general behaviour gave the impression of considerable excitement.

During the last week in February a female *C. bubalis* deposited a clump of eggs on a stone in the aquarium, and a male fertilized them and mounted guard over them. During the whole period, five to six weeks, of the development of the eggs the male never appeared to go more than a few inches from them (unless when forcibly driven away) and certainly would not allow any other fish (except another female when spawning) to lie on or under the stone where the spawn was. (I have been quite unable to obtain any evidence of the supposed nest building by the male *Cottus*.)

On March 15th, I found a second female just finishing spawning on the same stone, and saw the male in the act of fertilizing the eggs. The female was lying quietly under the edge of the stone close to the eggs; fins, depressed against the body; colour, pale opalescent greenish white; respiratory act, very fast, 46 per minute. The male was brilliantly coloured; pale orange ventrally, pectoral fins white spotted and blotched with colour. He kept twitching his fins, thereby displaying their colour; the first dorsal was generally kept erect, so displaying a large black central spot. The skin appeared flushed in the clear spaces. He jumped and turned about rapidly and excitedly and several times dashed under the edge of the stone below the female. When in this position semen was ejaculated from the penis, which was protruded to a length of 11 mm., on to the eggmass. The semen formed a white cloud rising 3-4 inches in the water at each

* CUNNINGHAM, J. T., *Colour changes in Cottus bubalis*, Journal, M.B.A., N.S. Vol. I., pp. 458-9.

ejection. The tentacles over the eyes were very distinct and quivering; the maxillary tentacle was held very erect, but I did not notice it in motion. Several times the male darted open-mouthed at the female and engulfed half her head in his mouth. The rate of the respiratory act was 36 per min. and very full—*i.e.*, the mouth was well open at the intake of water, the gill-arches well distended, apparently taking in as much water as possible—whereas the respiratory act in the female was much faster but not so full, in fact it was difficult (as it often is) to notice any distinct respiratory action at all.

An hour later the rate of respiratory act in the male was 30 per min., in the female 33 per min., in another gravid female 37. The normal rate at temperature 9° c. varies between 28 and 32. The normal rate for the male in question is 29.

Early in April a third female spawned on the same stone. All three females died within a few days of spawning.

It seems probable that increase in the rate of the respiratory act is correlated with increase in the rate of heartbeat. From numerous observations I find that excitement, whether sexual, or the result of a fight with another fish, or induced by expectation of food causes strong, full respiration. In gravid fish the rate of respiration is very often rapid. If fish are kept in water through which a very great deal of air has been driven, the rate of the respiratory act decreases, in the case of *C. bubalis* to as low as 22 per min.

II.—RECORDS OF

Lernæa (Haemobaphes) cyclopterina (Fab.).

This parasitic Copepod occurs occasionally on the gills of *Cottus bubalis*. Largs Channel.

Anas boscas (L.).—Mallard.

On March 14, I saw a duck with typical male plumage on the left side and the plain female plumage on the right side. North end of Cumbrae.

Colymbus arcticus (L.).—Black-throated Diver.

The 1901 Clyde Fauna List says "Probably not r. in the Firth from autumn to spring." I have seen immature

specimens of this species round Cumbrae during several years especially between December and February. They are fairly tame and easy to watch. On March 19th, I procured one which had been shot. The stomach contained several small stones and 26 fish otoliths chiefly of saithe. Otolith remains occurred in the rectum. The intestines contained large numbers of the cestode *Tetrabothrius macrocephalus* (Rud.).

Parachordodes violaceus (Baird).

Police-Sergeant Norman Morrison has kindly sent me a specimen of this Gordiid which he found in Kinlochleven. The species was determined by Dr. Jas. Ritchie.

**Notes on the occurrence of *Goodyera repens* R. Br.,
in Scotland.**

I.—By LAWRENCE WATT.

THE name Linnæus gave this plant was *Satyrium repens*, a name not used in modern floras. It was called *Goodyera repens* by R. Brown in *Aiton Hort. Kew* (Ed. 2), V. 197 (1813). The name of the genus is derived from John Goodyer, a Hampshire botanist who flourished 1597-1652. Hooker, in *The Student's Flora*, gives the localities as "Fir woods in East Scotland, from Cumberland, Berwick, and Ayr to Ross, rare."

Babington, in 1862, gives "Fir Woods in the North." Sir William Jackson Hooker, in his *Flora* of 1830, says, "Old Native Forests in the North, and especially in the Highlands of Scotland."

The plant at that time was fairly well known, and all the authorities mention fir woods as its habitat. The tenth edition of the *London Catalogue* says it is found in twenty-three counties. It is distributed through Mid and North Europe (Arctic), Siberia, Himalaya, and North America. I have seen it only in the three counties, Aberdeen, Banff, and Moray. Montcoffer Woods, Banff, where I first gathered it, extend for miles; but it grows

best in the open wood, facing the north. It occurs very sparingly on the south side; but, to compensate for that, one can gather *Linnæa borealis*, Gronov, in fine flower.

The first specimen I procured of *Goodyera* was from Inch, given me by the late Mr. D. Farquhar, then an active member of this Society. He did not give the exact locality. Inch is a fine open town, and there are small woods near it, where probably the specimens had been gathered. Being on a high level plain, it is now one of the health resorts in Aberdeenshire.

Mr. W. G. Craib, in his *Flora of Banffshire*, records it for fifteen parishes out of a total of twenty-seven. The most of them are all open to the sea, where the wind-driven clouds from the Moray Firth bathe the flowers with the salt moisture that assists the nourishment of the plants.

I gathered it last year by the roadside in what is now almost a shallow ditch, but also the remains of a fair-sized wood, as the stumps of the Beech trees still remaining were from fourteen to eighteen inches in diameter. We got a surprise when we saw the *Goodyera* growing among *Polytrichum commune* L. at the stumps of these trees, and they were as fine plants as ever I saw. This locality is near the old Castle of the Boyne, and about a mile from the sea. It grows in small woods where there is heather; not where there is grass only. In the fir woods at Fochabers, on the east side of the Spey, it flourishes. I have not gathered it west of the Spey.

No doubt fir woods, where there is heather, are its home, where the fine running roots can spread through the heather, and where its cream-coloured flowers can be seen to advantage. It grows well in the open ground where it is suitable for the roots to spread, and also where the evaporating clouds from the sea wrap them in moisture. It would be interesting to know where the localities are situated in the other twenty counties, as given in the *London Catalogue*.

II.—By JOHN RENWICK.

THE only locality in the Clyde area in which *Goodyera repens*, R. Br. (the creeping ladies' tresses), is known to occur is in the woods of Fullarton House, Troon, Ayrshire. It was seen in a plantation of pine trees and hardwood, on the side of the avenue to the north-west of the house, on the occasion of a visit of this Society in July, 1890. (*Proceedings*, Vol. III. (N.S.), p. liv.). Mr. A. Gilchrist informs me that he has also seen it in the south plantation, about a mile nearer Ayr than this locality.

It is recorded for this district in Hooker and Arnott, *The British Flora*, Seventh Edition, 1855, "Old fir forests in the north, and especially in the North Highlands of Scotland, near Fullarton House, Ayrshire." In the Eighth Edition, 1860, there is added, after Ayrshire, "introduced but now naturalised." In a *Botany of Ayrshire*, 1882, by Messrs. Borland, Duncan, and Landsborough, it is given on the authority of Mr. Duncan, of Troon, as found in the Parish of Dundonald, in which Fullarton estate is situated. Dr. Landsborough's father, the Rev. David Landsborough, of Stevenston, does not seem to have known it in 1841. As Mr. Gilchrist points out, he does not include it in a list of the rarer plants of Dundonald parish that he made up for the *New Statistical Account of Scotland*, Vol. V., Ayrshire, p. 671 (December, 1841).

The existence of this native of northern pine forests, in two spots in the one estate in the south-west of Scotland, appears then to be due to human agency. One is tempted to surmise that it may have been introduced, wittingly or unwittingly, when the plantations at Fullarton were made. These were probably formed by William Fullarton, who was proprietor from 1710 to 1759, and was an assiduous and successful botanist. (Paterson's *History of Ayrshire*, referred to in *The Glasgow Naturalist*, VI., 109, and VII., 20).

Had the seeds been brought by migratory birds on their southward journeys, one would have expected that the plant would have been found in pine plantations in other western localities between Fullarton and Inverness-shire (or Aberdeen-shire).

It is recorded in *Trans. Botanical Soc., Edinburgh*, XXI., 183 (1899), as occurring in pine woods near Kinloch-Ailort, in the south-west of Inverness-shire. For this information I am indebted to Prof. A. Henry, of the Royal College of Science, Dublin, who also referred me to a note in his description of *Pinus sylvestris* L. in *Trees of Great Britain and Ireland*, III., 577. "The orchid, *Goodyera repens*, which was formerly supposed to grow only in wild coniferous forests, as in the Highlands of Scotland, has begun to appear, of late years, in various localities where the Scots Pine has been planted, both in England and in France; and the problem as to how the seeds of the orchid reach these plantations is still unsolved. Cf. *Kew Bulletin*, 1906, p. 293; *Actes Premier Congrès Internat. Bot., Paris*, 382 (1900); and Fliche, in *Mem. Acad. Stanislas*, 1878." In a lecture on "Woods and Trees of Ireland," he says, "*Goodyera repens* and *Linnæa borealis* which are very characteristic of pine woods in Scotland are not known in Ireland."

Having informed him of the presence of *Goodyera* at Fullarton, and my conjecture as to its possible introduction, he replied, "The particular subject is in want of exploration, and is interesting on that account. Many pine-wood plants exist also in heather districts. Query, as descendants of the original pine woods, or as really natives of the heather where they are now? The evidence on Continent, Greenland, North America, &c., would all have to be sifted, and no one has done this."

Goodyera has disappeared from some localities through the cutting or blowing down of woods. Mr. G. F. Scott Elliot, in *Trans. Nat. Hist. Soc., Glasgow*, V. (N.S.), p. 200, quotes records of its removal in this way from Longforgan, in south east of Perthshire, and St. Fort Wood in Fifeshire. It is hardly likely, however, that this cause can account for its absence from the Clyde area, excepting at Fullarton, and from the neighbouring districts. But it may interfere with the continued existence of the plant in the South Wood at Fullarton. Mr. Gilchrist informs me that in the last few years there has been a good deal of house-building and road-making in this vicinity.

Alpine Louseworts (Pedicularis).

By ROBERT BROWN, M.D.

[Read 23rd February, 1915.]

One of the most striking features of the Alpine and Sub-Alpine Floras of Central Europe. is the brilliancy and variety of colouring in the varied genera which clothe the rocks and slopes of the mountain ranges. The varied blue species of the Gentian family, the equally varied but lighter blues of the Campanulaceæ, the yellow, crimson, and purple Primulas, the sweeping slopes of yellow and white Anemones, the high meadows full of the white Narcissus, with hundred of other colonies of spreading, low-growing patches of red, blue, and white rock-growing species assuredly make a deep impression on all who follow the attractions of nature amongst its flowers in the uplands of any country.

The natural order Scrophulariaceæ is no exception to the general rule and holds a prominent part in the series of alpine decorative genera. The beautiful Linarias, the yellow Fox-gloves, the wide group of the mountain Veronicas, and most beautiful of all, the species of the Pedicularis are included in this order.

For many years I have carefully collected, in different countries, the varied species of the Pedicularis, some growing in sub-alpine areas, others in essentially the higher slopes of the alpine ranges. The genus is very interesting and many species are exceedingly beautiful. The name of this order is not a very attractive one, and is derived, I believe, from a popular delusion that sheep which feed on or among the different species become always infested with vermin and especially lice.

The explanation which is very probably true is, that these plants grow generally in poor soil, and the herbage for the flocks is deficient in nutritious properties. The sheep thus became enfeebled, and the breeding ground of vermin.

The British Flora holds only two species of this family, viz. :—*Pedicularis palustris* L., the Marsh Lousewort, and *P. sylvatica* L., the Pasture Lousewort, both lovers of wet and marshy land.

The flowers of the genus are fairly large, arranged in spikes or racemes. The calyx is frequently inflated, either campanulate or tubular, and the teeth may be either simple pinnatifid or developed into leafy appendages. These features often mark the distinctive character of a species.

The corolla is bilabiate, the upper lip (a distinctive feature in species), being either prolonged into a long beak or ending in a short beakless curve, the lower lip three lobed. The leaves are usually alternate, and an important point in distinguishing species is their formation. They are deeply divided and either pinnatisect or bipinnatisect. The plants are parasitic on roots, and when pressed become blackish.

The prevailing colours of the Pedicularis family are red and yellow, and the majority of the plants grow erect with a more or less elongated spike.

Some years ago, while climbing over slightly marshy pasture land, well up in the mountain slopes above Cauteret on the Western Pyrenees, I found a large number of plants of a very diminutive form of *Pedicularis*. I carefully collected some, and after examining them, came to the conclusion that they were specimens of an Alpine form of *P. sylvatica* L. One peculiarity of this species is the presence of two teeth on the upper lip or hood, which has a very short beak, and comes under the section *Brevirostres*.

Another species, which is found in great quantity in the marshes, specially of the Engadine, where it covers large expanses of flat ground, and is specially prominent on mounds of soil forming small islands in the water flowing over the banks of rivers on to level land, is *Pedicularis verticillata* L., a dark red form which, when seen in marshes, lakes, meadows, shines crimson in the sunlight. It is quite distinct from the other marsh forms, and is at once distinguished by its leaf arrangement. It is called the Whorled Lousewort.

The stem is erect, and may be single, or several may spring from the same crown. The leaves are pinnate or pinnatifid and are in whorls. The flowers are arranged in a dense head, and the upper lip of the corolla is beakless, without teeth, and the plant accordingly comes under the section *Erostres*.

In 1894, I was working in the high slopes of Mount Pilatus, on the Lake of Lucerne, and by chance came upon a species which I had never seen before, which I did not see again until 1913, when I again found it on the sides of Pilatus. On each occasion the plants were very few, although at the latter date the colony had distinctly increased. The plants were very small, and not in any sense vigorous looking. They were growing at the foot of limestone rocks, from which water trickled. This species, *Pedicularis Oederi* Vahl or *versicolor* Wahlenberg, is yellow, with a reddish brown blotch of colour on the hood or helmet, a short stem more or less leafy, and crowned with a crowded oblong head.

It is not common, for during all the years I have wandered around, I have not seen it elsewhere than on Pilatus. It is found, however, in the Carpathians and the Eastern Alps.

This plant is included also in the *Erostres*—hood obtuse, without beak or teeth.

Pedicularis rostrata (Linn.).—This species is another low growing rather prostrate plant, and is fairly plentiful. I have found it on most of the high alpine slopes in Switzerland, Dauphiny, and very frequently on the mountain sides well up around Chamounix. The plant has generally many stems, but all lying in a flat, curved condition, then gradually rising into an upright position. The flowers on each stem number from two to five, and are very attractive. The flower has the lower lip large, of a pinkish tint, while the hood is much darker and ends in a long beak. The calyx lobes end in leaf-like appendages, and the plant forms an ideal one for a rockery. This species belongs to the section *Longirostres*, the hood terminating in a long linear beak.

In July, 1912, I spent some time at the hospice on the summit of Mont Cenis, and, during my stay there, I found what to me was a very distinctive species, growing on some of the stony slopes, and specially on a large moraine some distance from several glacier beds. On examination I found this was *Pedicularis rosea* (Jacq.). It is a small plant, about 4 inches high, the stems and petioles having a shiny red appearance, the leaves pinnate, with linear segments which are slightly toothed. The flowers are formed into a head, short, as a rule, but may be slightly

elongated. They are generally few in number. The hood is obtuse and without a beak, as will be seen by one of the specimens that I collected on the moraine. The roots are furnished with long and thick conical fibres. I have only seen this species in the Mont Cenis district, about 8,000 feet up.

Growing plentifully on the slopes of Mont Cenis was also *Pedicularis Cenisia* (Gaud.), a species about which there has been some difference of opinion. Bentham thinks it a hairy form of *rostrata*, but the whole character of this plant is so different from that of *rostrata* that it seems difficult to understand the statement. The only point of resemblance is in the flowers. *P. Cenisia* is a very handsome plant, the leaves beautifully green and bipinnate. As a rule they are woolly at the base of the petioles, and the calyx is also woolly. The corolla is, as in *rostrata*, a light pink, with broad underlip, and the hood a dark reddish purple with a long beak.

P. incarnata Jacq., included in the same section as *rostrata* and *Cenisia*, is a species quite different in appearance from either, and called by Crantz *rostrata spicata*. The plant is erect, ten to eighteen inches high, and the stem is very leafy, the leaves being more or less applied to the stem. The inflorescence is markedly spicate, the spike being in many cases loose. The corolla in this species is almost identical with the two former species, rose-coloured, with darker hood and a long beak. This plant is local but exceedingly plentiful on the Dauphiny mountains. Near Lautaret it forms large colonies and makes a good show in the pasture-land. It is very often whitish, and I have collected pure white specimens frequently. It also varies very much, and I show to-night two specimens from Lautaret and one from Heuthal, Engadine, which give some idea of its tendency to variation. It is found from 6,000 to 8,000 feet up.

P. gyroflexa (Gaud.).—Some years ago, when scrambling among the mountains near the glaciers at Lautaret, I found a colony of a very beautiful species of *Pedicularis*, a few plants together and limited in area. I carefully examined some specimens and made it out as *P. gyroflexa* (Gaud.). Since that first introduction I have collected it also at Mont Cenis, but have never seen it anywhere else. It is the most decorative species I have seen in flower. It stands about ten inches in height, is strong and robust in

appearance, and has a fine head of rose-coloured flowers, and is more or less woolly. The leaves are large, bipinnatifid, with inciso-serrate segments. The calyx is bell-shaped, with teeth ending in leaf-like appendages. The flowers are bright red, the lower lip of the corolla large, and the hood ends in a short conical beak. This plant is found up to 8,000 feet, and is both local and comparatively rare.

All the species I have described so far have been red, with the exception of *P. Oederi*. I have found growing in the alpine meadows of the Engadine, *P. recutita* L., a species differing from the other reds by its dark, almost greenish purple flowers, and dark green leaves. It varies much in height, sometimes reaching two feet, and it is very robust in growth. It is frequently found growing by the borders of running streams, and is generally not far distant from the snow. Amongst ordinary meadow plants it stands out distinct by its general purple colour. The root is thick with thickish fibres, stem erect, generally simple, leaves long, pinnatifid, with lanceolate segments which are crenelate and cartilaginous at their edges. The corolla is very dark, narrow on under lip with an obtuse hood having no beak. The flowers are arranged in a dense head, more or less elongated.

Belonging to the same section as the last (the *Erostres*) *P. foliosa* L. is a yellow and large growing plant, markedly distinct when found growing in alpine meadows about 6,000 feet up. It is a fairly leafy variety, but the leaves are congregated around a large head of flowers. The stem is erect, smooth and thick. The leaves are fairly large and pinnatifid, the segments are lanceolate, acuminate and furnished with mucronate teeth. The flowers are arranged in a large head, and are intermixed with leaves longer than the flowers, hence the name of the species. The corolla is large, light yellow in colour, small lower lip, obtuse hood, having no beak. Fairly common on all alpine ranges in Central Europe.

A species very common on the higher alpine meadows is *P. tuberosa* (L.), and its bright yellow flowers are very attractive on the slopes. It is about ten inches in height, and its root, from which it takes its name, is short, but sends out thick, almost fleshy, fibres. The stem is bent at the base, and forms a half-circle as it

assumes the upright position. The leaves are pinnatifid, with toothed segments. The flowers are in a short compact head; the corolla is a pale yellow, with a hood terminating in a fairly long beak. It is fairly common on mountain pastures, especially in damp spots.

P. Comosa L. is common in most alpine pastures, and is a very decorative and attractive plant. It grows, in suitable situations, to two feet. The stem is strong, erect, and leafy. The leaves are pinnate; pinnæ long, acuminate, pinnatifid to serrate. Stem leaves alternate, fairly large and spreading. Flowers are in a dense head, leafy at the base. The corolla is whitish-yellow, lower lip fairly large, the upper a curved hood shaped like a sickle with a short beak. It is a handsome plant, and stands out strong and beautiful in the alpine valleys, where it is mixed with plants of different colours.

As you will have gathered from the specimens passed round, there is great variety in the species of this interesting genus of higher alpine plants. I have often been surprised that they are not more cultivated in our alpine gardens, or even in the ordinary flower borders of gardens belonging to flower-lovers.

They are certainly a very beautiful and interesting part of the flora of the higher Alps.

Flowering Plants from Banffshire, &c.

By LAWRENCE WATT.

[Read 30th March, 1915.]

THE plants exhibited to-night, with two exceptions, were gathered in Banffshire, from the sea-coast to the upper reaches in the Cabrach at 1,000 feet. The Old Red Sandstone cliffs between Gamrie and Cravie, with their ridges of rock, afford a good shelter for a number of plants, but they are especially rich in *Hieracia*, as a few more can be added to the present list.

Polygala vulgaris Linn., near var. *grandiflora* Bab.—From the Old Red Sandstone, Gamrie. This is something like the large one that grows at the foot of Ben Lawers.

Ulex europæus Linn.—A small hairy form that grows on the sandy downs between Port-Gordon and the Spey. This ground is much infested with rabbits, which keep down the plants and retard their flowering, as they were in fine flower in the middle of July. The hairy form they assume may arise in some way from this circumstance.

Ononis repens Linn.—From sandy ground near Speymouth. This is one of the rare plants in the north.

O. repens Linn., var. *horrida* Lange. From the sands at Portsmouth, where it is plentiful.

Rosa involuta Sm.—Rocky banks, Glen Livet.

R. coriifolia Fr.—Rocky banks, Glen Livet.

R. mollis Sm.—Rocky banks, Glen Livet.

Hieracium langwellense F. J. Hanb.—Old Red Sandstone, Gamrie. This species is recorded from six British counties.

H. Schmidtii Taush.—Old Red Sandstone, Gamrie. This species is recorded from thirty-eight counties.

H. argenteum Fr.—Old Red Sandstone, Gamrie. This is recorded from nineteen counties.

H. argenteum Fr., var. *septentrionale* F. J. Hanb.—Old Red Sandstone, Gamrie. This, in the tenth edition of the *London Catalogue*, is only recorded for two counties.

Gentiana campestris Linn.—This white variety was gathered by Mr. Yeats on the Cabrach, altitude 1,000 feet. Mr. Bennett says it is a little like *baltica*, but to determine it the lower leaves are required. As this form is gathered now and again, it would be well to get the lower leaves, if possible, for the purpose of identification.

Myosotis scorpioides Linn., var. *strigulosa* Reichb.—This fine erect variety grows both at the side and in the River Isla at Grange, and also in the River Fiddish at Dufftown.

Thymus serpyllum Linn.—This white form from the Cabrach, gathered by Mr. Yeats, I sent to Mr. Bennett, but he thought there was no difference between it and the type.

Chenopodium Bonus-Henricus Linn.—Old Red Sandstone, Gamrie.

Salix rubra Huds.—Side of Loch Lomond at Luss. It differs from *purpurea* in the smaller catkins and the leaves not tapering so quickly from the centre to the tip.

Carex helodes, Link *Lævigata* Sm.—From the hills above Dufftown, altitude 900 feet. It is a softer *Carex* than *binervis*, with more drooping spikelets and shorter and broader root-leaves. It grows in boggy parts of the hills, while *binervis* grows on dry rocky ground. This is a new record for Banffshire.

Equisetum hyemale Linn.—From the Cabrach, at an altitude of 1,000 feet. Collected by Mr. Yeats. This *Equisetum* is rare in Scotland. It is recorded from the mouth of the Rotten Calder (Lanark) by Mr. M'Kay.

LOCALITY.	Date (a).		Girth.		At		Girth.		Increase in Girth.		Bole.	Height.	REMARKS.
	Ft.	In.	Ft.	In.	Ft.	In.	Years.	In.	Rate per ann. (c).				
Eglinton Castle,	4/1903	14 1½	5 0	11/1914	14 6½	4 7½	12	40	20	59(c)	(c)1913, W. of path.		
Do.,	9/1910	13 6½	4 6	11/1914	13 10	3 5	4	87	28	67(d)	(a)1913, Near No. 1.		
Do.,	6/1913	13 9½	5 0	11/1914	13 11	1 5	1 6	93	18	55(e)	(e)1914, S.S.W. of Castle.		
Fullarton House,	7/1903	14 8½	5 0	8/1914	15 3½	7	11 3	62	13	—	Field in front of stable.		
Do.,	7/1903	13 10	3 4	8/1914	14 8½	10 5	11 3	93	7	—	Corner of field to left of approach from Troon.		
Glendoune,	7/1898	9 8½	5 0	11/1905	10 5	8 5	7 5	1 13	—	—	(f) 1899, Near house and Chapel Walk.		
Kilkerran,	9/1904	13 11	5 0	7/1913	14 9	10	8 5	1 18	36	(B)76(f)	(f) 1899, Near house and Chapel Walk.		
Do.,	9/1904	12 6	6 0	7/1913	13 1½	7 5	8 5	88	25	(B)78(f)	Below Lady Chapel.		
Kirkmichael,	7/1896	18 2	{ 5 0 high side } { 6 2 low " }	—	—	—	—	—	11	(C)40(g)	(g)About 1878.		
Loudoun Castle, N.W. corner of Gowfield,	7/1908	14 4	5 0	8/1913	14 7½	3 5	5 4	65	25	85(h)	(h)1913.		
Do.,	8/1913	14 8½	5 0	—	—	—	—	—	34	—	—		
Do.,	8/1913	14 6	5 0	—	—	—	—	—	24	71	—		
Newark Castle,	9/1907	17 4½	4 0	—	—	—	—	—	—	45	—		

B Fide Mr. James Maxwell.
C. Fide Mr. R. Hutchison. *Trans. Highland & Agricultural Socy*, 1879, p. 69.

BUTESHIRE.

Kames Castle,	(A) 1878	10 8	5 0	2/1915	12 6	22	36	61	18	(B)68(a)	(a)1911	West of Castle.
		(B) planted about 1718.				128	153	84	—	—	—	—
Mount Stuart,	9/1903	13 9	5 0 (A) planted about 1712.	165	184	—	—	—	22	(B)80(a)	(a)	Near Monument.

A. Mr. James Kay. *Trans. Scot. Arbor. Soc.* Vol. IX.
B. Do. " *Buteshire Nat. Hist. Soc.* Vol. IV.

DUMBARTONSHIRE.											
	6/1911	16 11	2 8	9/1914	17 0	1	3·5	·28	4	63(a)	(a)1911. Spread in 1914=66 ft.
Cordale House,				9/1914	17 0	1	3·5	·28	4	63(a)	(a)1911. Spread in 1914=66 ft.
Dougalston,	3/1893	11 10½	6 3	9/1913	12 7½	9	21	·43	40	—	North of house.
Rosneath, Clachan Avenue,	4/1895	12 11	5 9	6/1908	13 10	11	13·3	·83	30	—	
Do,	4/1895	12 8½	5 0	9/1903	13 2	5·5	9	·61	30	—	Cut down before 1908.
Rossdhu (Arnburn),	9/1893	13 1½	5 0	6/1905	14 4	14·5	11·3	1·28	12	—	
Tullichewan Castle,	6/1894	12 4	5 6	10/1910	13 9	17	16·8	1·01	—	—	
LANARKSHIRE.											
Cambusnethan House,	5/1900	22 3	5 6	5/1914	22 11½	8·25	14	·59	16	70(a)	(a)1909.
RENFREWSHIRE.											
Ardgowan,	4/1894	12 5½	5 4	9/1914	14 4½	23	21	1·09	10	—	In park in front of house.
Do.,	5/1904	11 6	4 10	9/1914	12 3½	9·5	11	·86	10	—	
Auldhouse,	3/1892	15 6¾	5 0	12/1913	16 2	7·25	22	·33	14	60(a)	(a)1900.
Do.,	3/1892	14 2	4 10	12/1913	15 1½	11·5	22	·52	14	58(a)	Spread in 1900 =66½ft.
Castle Semplic,	4/1896	15 8½	4 8	cut down, 1902.	—	—	—	—	15	63(b)	Spread =66ft. (A) (b)about 1862.
Duchall,	9/1888	14 4	4 3	5/1907	15 10	18	18	1	10	—	
Erskine House,	2/1893	14 8½	4 3	—	—	—	—	—	—	—	
Finlayston House,	8/1907	10 8	5 0	1/1914	11 3¾	7·75	6·3	1·23	18	67(c)	(c)1907. Var. heterophylla.
Hawkhead,	9/1906	14 2½	5 0	—	—	—	—	—	27	—	
STIRLINGSHIRE.											
Buchanan Castle,	9/1900	18 6	2 6	—	—	—	—	—	8	—	
Do.,	9/1900	5 5¼	2 6	planted 1865.	—	65·25	32	2·04	35	—	

A. Trans. Highland & Agricult. Soc. About 1862.

LIST OF MICROFUNGI OBSERVED AT FUNGUS FORAYS TO CARNWATH
ON 19TH SEPTEMBER, AND GARTHLAND (LOCHWINNOCH) ON
10TH OCTOBER, 1914.

	Carn- warth.	Garth- land.
Spinellus fusiger (Link) van Tiegh. On <i>Mycena galopoda</i> ,	+	
Cystopus candidus (Pers.) Lér. On <i>Capsella Bursa-pastoris</i> ,		+
Bremia lactucæ Regel. On <i>Senecio vulgaris</i> ,		+
Plasmopara nivea (Ung.) Schröt. On <i>Ægopodium Podagraria</i> ,		+
Protomyces macrosporus Unger. On <i>Ægopodium Podagraria</i> .	+	+
Tilletia decipiens (Pers.) Körn. On <i>Agrostis vulgaris</i> ,	+	
Puccinia centaureæ DC. On <i>Centaurea nigra</i> ,		+
P. poarum Niels. As <i>Æcidium</i> on <i>Tussilago Farfara</i> ,		+
Phragmidium mucronatum Fr. As <i>Uredo</i> on leaves of <i>Rosa canina</i> ,		+
Lophodermium pinastri (Schrad.) Chev. On fallen pine leaves,	+	
Coryne sarcoides (Jacq.) Tul. On a dead branch,		+
Humaria granulata (Bull.) Sacc. On cow-dung,		+
Pseudopeziza ranunculi (Wallr.) Fekl. On <i>Ranunculus repens</i> ,		+
Podosphæra oxyacanthæ (DC.) De Bary. On <i>Cratægus Oxyacantha</i> ,		+
Erysiphe Martii Lév. On <i>Lathyrus pratensis</i> ,	+	
Cordyceps militaris (Linn.) Link. On a dead lepidopterous pupa,		+
Phyllachora podagrariæ (Roth) Karst. On <i>Ægopodium Podagraria</i> ,	+	
Ph. junci. (Fr.) Fekl. On <i>Juncus conglomeratus</i> ,	+	
Stigmatea Robertiani Fr. On <i>Geranium Robertianum</i> ,		+
Xylaria Hypoxylon (Linn.) Grev. On decaying trunks and stumps,		+
Sphærella rumicis (Desm.) Cooke. On <i>Rumex obtusifolius</i> ,		+
Phyllosticta mercurialis Desm. On <i>Mercurialis perennis</i> ,		+
Septoria podagrariæ Lasch. On <i>Ægopodium Podagraria</i> ,		+
S. Stachydis Rob. & Desm. On <i>Stachys sylvatica</i> ,		+
Melasmia acerina Lév. On <i>Acer Pseudo-platanus</i> ,		+
Gleosporium curvatum Oud. On <i>Ribes nigrum</i> ,	+	
Trichoderma lignorum Tode. On rotten sacking,	+	
Ovularia obliqua (Cooke) Oud. On <i>Rumex obtusifolius</i> ,	+	+
Didymaria didyma (Ung.) Schröt. On <i>Ranunculus repens</i> ,	+	
Ramularia taraxaci Karst. On <i>Taraxacum officinale</i> ,		+
R. calcea (Desm.) Sacc. On <i>Nepeta Glechoma</i> ,		+
R. Plantaginis Ellis & Mart. On <i>Plantago major</i> ,		+
R. Plantaginea Sacc. & Berl. On <i>Plantago lanceolata</i> ,	+	
R. urticæ Cés. On <i>Urtica dioica</i> ,	+	
R. pratensis Sacc. On <i>Rumex Acetosa</i> ,	+	
Stilbum erythrocephalum Ditm. On rabbit-dung,		+
Isaria farinosa (Dicks) Fr. On a dead lepidopterous pupa,		+
Sclerotium roseum Kneiff. In dead culms of <i>Juncus con- glomeratus</i> ,	+	

Excursions.

FINLAYSTONE, GARTHLAND, AND CARNWATH.—Mr. R. B. Johnstone reports that in conjunction with the Andersonian Naturalists' Society, fungus forays took place to Finlaystone, near Langbank, on 3rd October, and Garthland, near Lochwinnoch, on 10th October, 1914. Fine weather prevailed on both days, and, in keeping with forays made by some of the members to other districts this year, the finds exceeded all records of recent years. The numbers recorded for the different species observed were not so great, large clusters and groups being absent, but the genera and species were more varied and unusual. The most noted finds were *Tricholoma melaleucum*, var. *adstringeum* (at Garthland); *Mycena tenerrima* (at Finlaystone); *Entoloma sericellum*, *Pholiota marginatum*, and *Inocybe asterospora* (all these at Garthland); *Hypholoma pyroticum* (at Finlaystone); *Hygrophorus unguinosus*, *Russula cutefracta*, and *Exidia glandulosa* (all at Garthland); and *Mutinus caninus* (at Finlaystone). The total number of species noted at the two places was 129. At Garthland certain trees attracted attention, notably *Acer rubrum*, *Arbutus Menziesii*, *Crataegus orientalis*, and probably *Carya porcina*.

In supplement of the Report on the Fungus Forays to Carnwath on 19th September, and Garthland on 10th October, submitted by Mr. R. B. Johnstone, this note and the list opposite are now added by Mr. D. A. Boyd, indicating the species of microfungi observed on both these occasions. The list is comparatively small, and does not include any species notable for its rarity. It may be remarked that fungus forays are in general rather unproductive of microfungi. This is due to the fact that time is usually allowed for the examination of such places only as are likely to yield agarics and other large fungi, while no halt is made at places where agarics are not likely to occur. Very often the spots where toadstools abound are comparatively barren of microfungi, while places overgrown with decaying herbage and other vegetation are usually rich in microfungi but destitute of agarics.

Perhaps the most interesting species included in the list are *Glæosporium curvatum*, a recent addition to the British fungus-flora, which occurred abundantly as a parasite on leaves of black currant near Carnwath. Of the parasitic moulds, *Ramularia taraxaci* on dandelion leaves, *R. plantaginis* on leaves of great plantain, and *R. plantaginea* on those of ribwort plantain, have seldom been reported from English localities, although they all appear to be fairly common throughout the West of Scotland. Our climate, however, appears to be specially favourable for the development of parasitic hyphomycetes, and the list of species of *Ramularia* found in the Clyde area is believed to be larger than that reported for any other region in Britain.

Note.

Arrival of Summer-Visitors at Possil Marsh, 1915.—The following species were first observed on the dates mentioned. Lesser blackbacked gull, 14th March. On 6th April, two wheatears (♂ and ♀); 9th, two swallows (♂); 14th, several white wagtails; 23rd, two yellow wagtails; 25th, one common sandpiper and one willow wren. In May on the 2nd, the whinchat; 3rd, corncrake, also a few sand-martins; 6th, a pair of swifts, also the cuckoo, and at least three sedge-warblers; 9th, two whitethroats and two house-martins.

WILLIAM RENNIE.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VII., No. 3.]

[September, 1915.

A Visit to the Source of the River Falloch.

BY JOHN R. LEE.

[Read 25th May, 1915.]

FOR some time I have had a desire to explore the hill country lying to the north and north-east of Loch Lomond, which forms the gathering ground of the Falloch and its eastern tributary streams. This is an alpine area of considerable extent, many points of which attain a fairly high altitude; and from the botanical standpoint it has always seemed to me to be worth a fuller investigation than it appears to have received. The hills lying to the west of Glen Falloch are known to be somewhat rich botanically, and recent excursions have revealed many features of great interest in the glen itself; but of the higher ridges on the east and around the source of the river our knowledge is rather meagre. The difficulty of access is, of course, the principal drawback, there being no convenient village or railway station from which a visitor from Glasgow can work as a base. Excursions of this society, and of the Andersonian Naturalists' Society, have taken place to the vicinity, but, apart from a walk up or down the glen, the only alpine work that has been undertaken

has been the ascent of Corrie Ardran and the peaks of Cruach Ardran and Stob Garbh from Crianlarich, the whole of which ground is on the north of the watershed, and so forms part of the drainage area of the Tay, being included in Buchanan White's province of Breadalbane. This district, like all the rest of the Breadalbane area, is rich in alpine plants; and the close proximity of the source of the Falloch to the watershed dividing the Tay from the Clyde drainage seemed to offer possibilities of adding some items of interest to the Clyde list from such a little-known outlying corner of our own area. A short holiday at Crianlarich in July of last year seemed to provide the wished-for opportunity; and, accordingly, I devoted two days to the exploration of the corrie at the head of which the Falloch takes its rise. The botanical results sufficiently justified expectations; and the present notes are laid before the society by way of calling the attention of our botanical members to a neglected portion of the Clyde area, in the hope that further exploration of the district may lead to still more important additions to the list from the same region.

At the outset some account of the topography of the district may be given. The River Falloch rises in a spring situated in the middle of a patch of marshy ground densely overgrown with *Sphagnum* and other mosses, lying at the head of a corrie which is surrounded by magnificent mountains, and at a distance of about four miles in a straight line due south from the village of Crianlarich. The position of this spring, to be geographically exact, is—lat. $56^{\circ} 19' 56''$ N.—long. $4^{\circ} 36' 59''$ W.—altitude 2,506 feet above mean sea-level. Unlike many if not most rivers, the Falloch cannot be said to be formed by the union of a number of streams or rills, but takes a definite rise in the spring mentioned, being a brook with a considerable flow even from the point where it first gets clear of the mosses which form its swampy cradle, while all the numerous other streams which flow into it can be properly regarded as tributary and secondary. The course of the river is for a distance of about a mile N.N.E., when it turns

to the N.W., and flows in that direction for $2\frac{1}{2}$ miles to a point about a mile south-west of Crianlarich, where it quite sharply and suddenly takes a turn to the S.W. This direction it then follows for about four miles, the remaining two miles of its course being due south to the point where it enters Loch Lomond at Ardlui. My investigations during the two visits referred to were confined to the corrie above the point where the river's course takes the sudden change from N.W. to S.W.

The hill-sides on the north-east of the corrie—that is, facing to the south-west—appear to have a grassy surface for the most part; and, both from this feature, and from the direction of exposure, did not seem to offer much in the way of botanical possibilities; but those forming the southern and south-western boundaries presented a series of rock-ledges and precipices which, at a distance, seemed to give considerable promise of a rich and varied flora. Especially I was attracted by the hill-slopes on the south-west, where the rock faces had an exposure due north-east—the direction which in all our experience of the western hills has invariably proved to be the most favourable exposure for the occurrence of alpine plants. My first objective, therefore, was the rocks on this south-western side of the infant Falloch. The three mountains which stand round the head of the stream, and form the upper end of the corrie, may be briefly referred to. The north-eastern boundary is formed by Stob Glas—a spur or shoulder of the lofty peak of Cruach Ardran, one of the most interesting mountains in the district, but unfortunately having its richer slopes outwith the Clyde area. The south end of the corrie is closed by the lofty and picturesque ridge of Ben-a-Chroin, a long rocky hill with a rugged top culminating in a point at its eastern extremity 3,107 feet in altitude. The rocks facing the corrie, with a northern exposure, give some fine examples of cliff scenery, occasionally of an imposing character, often high, precipitous, and sometimes overhanging. It may be remarked here that there are several points, especially near the eastern end of the ridge

where caution is necessary, particularly in descending, and where dangerous cliffs are encountered unexpectedly. Ben-a-Chroin is, in fact, one of the mountains where a little experience stands one in good stead. The remaining, and, so far as my brief observations seem to indicate, the most interesting of these mountains, is the one forming the south-west side of the corrie, and situated to the north-west of Ben-a-Chroin, from which it is divided by the col in which lies the spring whence the Falloch takes its rise. This fine hill attains an altitude of 3,265 feet, and is composed of a succession of ridges, with rock-faces sloping steeply towards the corrie, but with few of the dangerously high cliffs which characterise its neighbour. The rocks are, however, sufficiently high and steep to render an ascent direct from the upper part of the corrie a matter of great difficulty. Fortunately, this is not at all necessary, as the rocks can be reached quite easily from above; and by making the ascent from a point lower down the corrie, crossing the peak, and then taking the rock-ledges on the way down, the whole of this rich botanical ground can be quite easily explored. Curiously enough, the name of this mountain is not given in the smaller published maps of the district, but in the six-inch ordnance map it is called An Caisteal—meaning, I believe, “The Castle”—a name of somewhat obscure application. I first learned the name from the perusal of the excellent description of Glen Falloch by Mr. John Renwick in *The Glasgow Naturalist*, Vol. V., pp. 98-101, where much interesting information regarding the topography is given, besides some suggestive remarks upon the geological features of the district. I am further indebted to Mr. Renwick for some additional facts in connection with the altitudes of various points on these hills, amongst which he mentions in a letter to me that An Caisteal appears to be the fifth in order of altitude of the hills with a drainage to the Clyde. The four points which exceed it in height are Ben Laoigh (3,708 feet), Cruach Ardran—S.W. peak—(3,429 feet), Ben Oss (3,374 feet), and Ben Ime (3,318 feet.)

The entrance to the corrie is guarded on its south-western side by a hill called Sron Garbh (2,322 feet), which forms the most westerly point of the shoulder of An Caisteal, the ridge connecting the two presenting a gradually ascending series of heights, culminating in the topmost point of the latter near its south-eastern extremity. From the slopes of Sron Garbh facing Glen Falloch proper, and extending for a considerable distance down the glen, the hill-sides above the left bank of the river are picturesquely dotted over with pines (*Pinus sylvestris*), evidently the remains of an ancient forest. The highest of these trees stands in lonely majesty on the ridge at a point overlooking both the upper part of Glen Falloch stretching southwards towards the Falls, and the desolate region of the corrie to the eastwards. The position of this tree, which is visible from the corrie when ascending for some time after the others have been lost to view, is somewhere about 600 feet in altitude, which is thus (roughly) the upper limit of the pine in this region. Along the banks of the river itself, and for some distance up the hill slope, the birch occurs in some abundance in the corrie. Near the point at which the course of the river alters from N.N.E. to N.W. the ruins of what must at one time have been an extensive forest of birches extends over a large area of the hill southwards up to 1,700 feet altitude. Some of these birches are still of considerable size, but most are very much decayed.

A notable feature of these hills is that the bracken, although abundant, is not such a dominant plant as is the case in some other districts. At no point in the corrie, nor, indeed, anywhere in the vicinity, did I observe the dense jungle-like growth with which one has to contend in ascending many Scottish hills. Another feature—equally satisfactory from the farmer's point of view—is that the characteristic "nardus-moor" of some districts with comparatively poor pasture is not developed to any great extent. This dominance of *Nardus stricta* is usually indicative of a wet, sour substratum. In the lower parts of the corrie, ascending towards An Caisteal, I was greatly interested to notice that the dominant

grass over large areas was *Molinia cœrulea*, indicating a much finer and richer pasturage. The specific composition of the pasture at 600 feet altitude was, at one point where I made a note of it, as follows:—

Molinia cœrulea } dominant.
Scirpus cœspitosus }

Anthoxanthum odoratum.

Holcus lanatus.

Agrostis (*vulgaris*?).

Juncus acutiflorus (sparingly distributed).

Potentilla Tormentilla.

Luzula (*erecta*?).

Narthecium ossifragum.

The two dominant species prevailed respectively where the *Sphagnum* was less or more abundant. In places where the sphagnum-growth became excessive, and the ground in consequence very wet, both species were replaced by *Juncus acutiflorus*.

The altitudinal limit of the bracken seemed to have a slightly higher average here than in most districts in the west, its general level being about 1,200 feet, although, of course, extending in places, along the sides of streams, and in sheltered corners, to a much higher point.

During my first ascent, I kept to the right bank of the stream for about a mile after crossing the railway line at the point where the Falloch takes its sharp, almost rectangular, change of course from N.W. to S.W.; and on this side of the valley I crossed a belt of swampy ground about 600-700 feet altitude, where the dainty pale spikelets of *Rhynchospora alba*, growing in considerable abundance, made a fine show. This pretty little beak-rush was also common, but not so abundant, on the left bank of the stream at about the same altitude.

Another feature of the lower slopes was the considerable frequency of the melancholy thistle (*Cnicus heterophyllus*) in little sheltered hollows by the sides of streams. Some specimens were very handsome examples of the species.

As already mentioned, I paid two visits to the corrie, the first being on 24th July. The day was somewhat misty, with rather heavy showers of rain at intervals during part of the time, and did not appear altogether favourable for my purpose. However, I had succeeded in reaching the steeper slopes above the birches on An Caisteal before the clouds became seriously threatening, and it was too late to abandon the ascent altogether. I was then in the alpine region, with abundant evidences of altitude in the plant species all around. In particular, I was interested in the unusual abundance of *Sibbaldia procumbens* growing luxuriantly on the humus. Other ordinary alpine forms, such as *Juncus trifidus*, *Saxifraga stellaris*, *Gnaphalium supinum* *Thalictrum alpinum*, *Luzula spicata*, and, of course, the ubiquitous *Alchemilla alpina*, were abundant everywhere. The only other plant, which, so far, had rewarded my exertions of any consequence, was *Cerastium alpinum*, although this, and an extraordinary abundance of *Saxifraga oppositifolia* (long past flowering, of course) seemed to quite justify my visit. Up to this point, however, there did not appear to be any feature of outstanding botanical interest, and as the weather seemed to be getting worse, I had almost decided to return to a lower level. Finding by the barometer, however, that I was within about 600 feet of the summit of An Caisteal, I made up my mind to go on to the top, so as to learn what the ridge was really like. Arrived at the cairn, a strong westerly wind drove the mist from the hill for a few minutes, and I was rewarded with a view of extraordinary beauty in several directions. Indeed, so delightful was the panorama, that one felt it almost incumbent upon one to return to the spot under more favourable weather conditions. Hence one, and perhaps the chief, reason for my second visit, three days later.

It was on my descent from the summit of An Caisteal, however, on this first occasion that I was both surprised and delighted with the rich botanical features of the hill. On ascending I had missed the rocks facing the north-east, and had got on to the main ridge before reaching the richest

part of the hill. From the cairn I had a good view of the spring at the source of the Falloch, and it was in trying to reach it that I caught sight of the rock-ledges sloping away to the north. Instinctively I abandoned the attempt to reach the source of the river, and turned my attention to the rocks. Commencing at an altitude of 3,000 feet, and working gradually downwards along the slope to about 1,800 feet, I had a time of genuine enjoyment, every few yards revealing some new feature of interest, and many rare finds appearing to delight the eye, as the list which follows will show.

On my second visit, on 27th July, I followed pretty nearly the same route in ascending, except that I kept to the left bank of the Falloch, and went further up towards the rocks before making for the ridge. This time I did not revisit the rich rock-ledges of An Caisteal, but after leaving the cairn went right round the extreme south end of the corrie to the source of the Falloch, crossed the stream, and ascended Ben-a-Chroin, which latter mountain I traversed from end to end of the ridge, descending by a gully at its eastern extremity, and examining the rock faces on the return journey to the corrie. These I found also to be fairly rich, but not so much so as the ledges of An Caisteal, nor did I observe anything in the way of alpine flowers on this hill additional to those noted on the former occasion. However, I had succeeded in my main object, which was to complete a survey of the rocks of the whole corrie, and so to be able to give some fairly accurate account of the botanical features of the region. Added to this, the weather on this second occasion was perfect, and from the two vantage points—An Caisteal and Ben-a-Chroin—I obtained two of the most beautiful views of bonnie Scotland I have ever been privileged to behold.

One would like to be able to do justice to the scenic wonders of the prospect from these hills; but one feels that any attempt to describe it would altogether fail. Some idea of the extent of the prospect may, however, be conveyed, by saying that from An Caisteal, looking south-west, the whole extent of Loch Long is visible through the gap between Crois

and Cruach Tarbet, extending from Arrochar almost to Blairmore, with portions of the Firth of Clyde beyond. From Ben-a-Chroin, looking north-west across the swelling ridges of Breadalbane and the western Grampians, Ben Nevis could be seen crowning the picture on the sky line. Westwards, from both hills, the view embraced that glorious stretch of mountain country including the peaks of Ben Cruachan, Ben Laoigh, and Ben Buidhe, and in the far distance the hills of Mull and Morven. Most majestic of all, however, the noble form of Ben Lomond rose in massive grandeur to the south, seen from this side to the greatest advantage, with the foreground composed of the rugged hills of Glen Gyle; while eastwards the view extended over the beautiful ridges of the Trossachs and Balquhiddy to where Ben Voirlich and Stuc-a-Chroin formed the sky-line in that direction.

As regards the plants, it would, of course, have been comparatively easy to compile a list of all the species observed, but as I did not set out with that intention, and as, in any case, such a list, embracing only the observations of a first visit, would probably have been more remarkable for its omissions than for its records, I have only attempted to enumerate the most important finds, and to give a few brief notes upon them. They are given here, not systematically, but in the order in which they were observed in the descent by the rocks of An Caisteal.

Aspidium Lonchitis Sw.—At the outset of my examination of the rocks, I was greatly delighted at finding a magnificent specimen of the Holly Fern, with fronds some 18 inches in length. This fern I found to be fairly frequent on the rocks on the higher part of the hill. The Holly Fern is recorded from several localities within the Clyde area, but cannot be regarded as common. It seemed to be more luxuriant here than in any of the Clydesdale stations where I have observed it.

Saxifraga nivalis L.—The only locality mentioned in the appendix to Henny's Flora for this rare species is Ben

Lomond. The same locality is given in the 1901 list, and in the "Glasgow Catalogue" compiled by the late Mr. P. Ewing a record for Dumbartonshire is also given, the exact location of which I do not know. A recently published paper by Mr. Thomas Nisbet (*Annals of the Andersonian Naturalists' Society*, Vol. IV., p. 14) records its occurrence on Cnoc Coinnich in Ardgool, where it was also observed a number of years ago by Mr. Herriot. These are our only recent local records of the plant, but in Buchanan White's "Flora of Perthshire" its occurrence in "Lomond"—in which province the Falloch corrie is included—is mentioned. This interesting plant I found to be fairly plentiful on the rock-ledges, some of the specimens being amongst the largest and finest I have ever seen.

Cerastium alpinum L.—There was a fair abundance of this beautiful plant all over the higher parts of the hill. It is a common species on the richer Breadalbane mountains, but occurs only sparingly in other districts.

Salix Lapponum L.—This was by far my most important find, as it appears to be the first record for the Clyde area. I first made the acquaintance of the Lapland Willow in company with the late Mr. Ewing in Corrie Ardran some nine years ago. Since then I have found it in several stations in Breadalbane, and have long had the desire to be able to add it to the Clyde list. It is not given for "Lomond" in Buchanan-White's "Flora," and does not appear in the 1901 "Handbook." I was on the look-out for it while examining the rocks on An Caisteal, and first caught sight of what I took to be the species high up beyond reach on one of the rocks at about 2,800 feet. Some 200 feet lower down, however, I found it in some quantity within easy reach, and was able to verify it.

Vaccinium uliginosum L.—This plant is quite abundant on the rocks at the higher elevations in the corrie. Formerly regarded as rare, it has now been recorded from so many alpine localities in our area, that one can only conclude it should be regarded as a common alpine species previously overlooked.

Saxifraga oppositifolia L.—I have already referred to the abundance of this species on these rocks. I found it all over the higher parts of the corrie, trailing in great quantities and forming long festoons over the rock ledges. The abundance of old fruits bore evidence of the grand show of flowers which must have adorned these rocks in the early spring-time. An ascent of An Caisteal in April might be attended with some discomfort, but a sight of this mass of purple glory would, I should think, be an ample reward.

Saussurea alpina D.C.—I was very pleased to be able to add this to the few definitely known localities of the occurrence of this species in the Clyde area. I found it on the rock ledges of An Caisteal at an altitude of about 2,500 feet—which, curiously enough, is the altitude given in all the published notices of its occurrence. This is a late-flowering species, being seldom seen in bloom before August, and consequently the plants were merely beginning to show buds at the time of my visit.

Hieracium nigrescens Willd.—This, and one or two other species of hawkweed were making a beautiful display at many points on the rock faces, both on An Caisteal and Ben-a-Chroin. It may be remarked that this is rather famous ground for these plants, the corries both of Cruach Ardran and Glen Falloch being often referred to in the works of specialists upon this difficult genus. The form which I have ventured to name *H. nigrescens* agrees pretty closely with the description of the type form of that species, as given by Hooker, and is a rather striking and beautiful plant. The leaves are somewhat narrow, ovate-lanceolate, with large irregular teeth, and the flower-heads rather large, few, in a loose corymb, and composed of deep, golden yellow florets with a dark glandular involucre, and dark styles. I also observed another species of somewhat similar aspect, but with yellow styles, and a different foilage, to which, so far, I have been unable to attach a name.

Hieracium anglicum Fr.—This, the commonest, and perhaps the handsomest of our distinctively alpine hawkweeds, was very abundant all over the rocks.

Sibbaldia procumbens L.—As already mentioned, this plant grows in extraordinary abundance on the humus at the higher elevations on An Caisteal. I found it to be quite common all over the upper parts of the corrie.

Juncus trifidus Koch.—This pretty little rush, characteristic of alpine rock-ledges, and fairly frequent on most high hills, was abundant everywhere.

Salix herbacea L.—This plant, a constant feature of the ‘summit flora’ of the higher Scottish mountains, appeared, in its typical form, to be rather less frequent on these hills than is usually the case at such altitudes. The large-leaved form recorded by me from the Arrochar district (*Annals of the Andersonian Naturalists’ Society*, Vol. III., p. 114), and which I have since seen in a few Breadalbane localities, was growing in several places on An Caisteal. It is, I believe, a hybrid, but its origin is not perfectly determined.

Carex pulla Good.—This interesting sedge, one of the common alpine species on the Breadalbane hills, and recorded from two localities in the Arrochar district, was very abundant in marshy places at a high altitude.

Poa glauca Sm.—This is a beautiful alpine grass, usually found in shady corners of the rocks. It has been recorded from Ben Lomond and Ben Voirlach, and may possibly be more common than is usually supposed. I found it on the rocks of An Caisteal at 2,500 feet.

Poa alpina L.—Large, handsome plants of this species, with viviparous spikelets were growing on a rock-ledge, at a similar elevation. These two grasses I gathered while ascending on my second visit to the hill, on a long shelving rock-face running steeply up the hill in a direction almost due east and west, and with, consequently, an exposure to the north. I did not observe them elsewhere, but they are probably not infrequent in other parts of the hill.

Juncus triglumis L.—This is, in my experience, one of the commonest plants in alpine localities wherever there is a patch

of wet, marshy ground at an elevation of 2,000 feet and upwards. It is surprising that it should have been regarded as "rare" when the "Clydesdale Flora" was compiled, and that even in 1901 its only recorded stations were Ben Lomond, Carradale, and Arran. Here, in the Falloch Corrie, as elsewhere, it occurs abundantly in the higher parts.

Of the commoner alpine plants, not included in the above notes, it may be sufficient merely to record the names of those observed. These included *Thalictrum alpinum* L., *Cochlearia alpina* Wats., *Silene acaulis* L., *Alchemilla alpina* L., *Saxifraga stellaris* L., *S. aizoides* L., *S. hypnoides* L., *Sedum Rhodiola* D.C., *Solidago cambrica* Huds., *Gnaphalium supinum* L., *Vaccinium Vitis-Idæa* L., *Oxyria reniformis* Hook., *Luzula spicata* D.C., *Carex rigida* Good., *C. flava* L., *Asplenium viride* Huds., *Lycopodium alpinum* L., and *L. Selago* L.

Some Recent Additions to the List of Microfungi of the Clyde Area.

By D. A. BOYD.

[Read 29th June, 1915.]

THE species of Microfungi mentioned in the following notes have recently been added to the British list. The records are based upon specimens which were obtained by the writer in various localities within the Clyde Area, and were submitted to Miss A. Lorrain Smith, F.L.S., and Mr. J. Ramsbottom, M.A., of the British Museum (Natural History), London. I have gratefully to acknowledge their kindness in examining and reporting upon the material placed in their hands, as well as my indebtedness to them for information contained in the present paper. A full description of each species, with details of spore-measurements, &c., will be found in a paper on "New or Rare Microfungi," by Miss Smith and Mr. Ramsbottom, in the *Transactions of the British Mycological Society*, Vol. V., pp. 156-168,

The species recorded for Stonehouse and Killermont were obtained at excursions of the Andersonian Naturalists' Society. The former locality was visited on 27th June and the latter on on 24th October, 1914.

NEW TO SCIENCE.

- Phyllosticta valerianæ* A. L. Sm. and Ramsb., *op. cit.*, p. 158.—
In discoloured spots on living leaves of *Valeriana officinalis* ;
Glen Easdale, Whiting Bay, Arran ; August, 1913.
- Ascochyta mimuli* A. L. Sm. and Ramsb., *l.c.*—In discoloured
spots on living leaves of *Mimulus Langsdorfi* ; Dalry,
Ayrshire ; August, 1913.
- A. galeopsidis* A. L. Sm. and Ramsb., *l.c.*—In brownish or pale
spots on leaves of *Galeopsis Tetrahit* ; Machrie Bay, Arran ;
August, 1913.
- A. urticae* A. L. Sm. and Ramsb., *op. cit.*, p. 159.—In discoloured
spots on living leaves of *Urtica dioica* ; Colintrave,
Argyllshire ; August, 1913.
- Stagonospora bromi* A. L. Sm. and Ramsb., *op. cit.*, p. 160.—
In spots on fading leaves of *Bromus ramosus* ; Dalry ;
August, 1913.
- S. heraclei* A. L. Sm. and Ramsb., *op. cit.*, p. 161.—In spots on
a fading leaf of *Heracleum Sphondylium* ; Dalry ; August,
1913.
- Monotospora affinis* A. L. Sm. and Ramsb., *op. cit.*, p. 167.—On
rotten wood ; Killermont, Dumbartonshire ; October, 1914.
- Triposporium Boydii* A. L. Sm. and Ramsb., *op. cit.*, p. 168.—
On rotten wood ; Killermont ; October, 1914. Also at
West Kilbride, Ayrshire ; February, 1915.
- Helicosporium Boydii* A. L. Sm. and Ramsb., *l.c.*—On rotten
wood ; West Kilbride ; February, 1915.
- Dictyosporium Boydii* A. L. Sm. and Ramsb., *l.c.*—On rotten
wood ; Killermont ; October, 1914.

NEW TO BRITAIN.

- Diptodina sonchi* Henn.—In discoloured spots on living leaves of *Sonchus arvensis*; Colintrave; August, 1913.
- Septoria scutellarice* Thüm.—In discoloured spots on living leaves of *Scutellaria galericulata*; Colintrave; August, 1913.
- S. bellidis* Desm. and Rob.—In olive or yellowish-brown spots on leaves of *Bellis perennis*; Dalry; August, 1913.
- S. senecionis-sylvatici* Syd.—In pale-brown spots on leaf of *Senecio Jacobæa*; Colintrave; August, 1913.
- Cercospora virgaureæ* (Thüm.) Allesch.—On living leaves of *Solidago Virgaurea*; Colintrave; August, 1913.
- Ramularia cardamines* Syd.—On living or decaying leaves of *Cardamine amara*; Dalry; August, 1913. Also near Stonehouse (in glen on Cander Water, Dalsersf Parish), Lanarkshire; June, 1914.
- R. Schulzeri* Bäuml.—On living leaves of *Lotus uliginosus*; Kilwinning, Ayrshire; August, 1913. Also on same host near Largs and in Cumbrae.
- R. angelicæ* von Höhn.—On living leaves of *Angelica sylvestris*; Glen Easdale, Whiting Bay; August, 1913.

 The Mute Swan (*Cygnus olor*) at Possil Marsh.

 BY WILLIAM RENNIE.

 [Read 29th June, 1915.]

I have brought together a few notes on the Mute Swans frequenting Possil Marsh, confining myself to the last seven years (1909-1915). There are several places around the Cadder district that are frequented by Mute Swans, and wherever they are found the birds always add a grace to the

locality. Although these localities provide good enough feeding-ground, yet all of them are not suitable for nesting. To all appearances Possil Marsh suits all the birds' requirements, although, unfortunately, at times their nests are disturbed. Nowhere do they seem safe from the egg harrier.

Long have I enjoyed the pleasure of wandering round about the marsh in the pursuit of nature study, and I have derived the greatest pleasure from watching the increase, the decrease, and the nesting of the swans, and the interesting incidents that occasionally take place grow as time rolls on.

“The Mute Swan is not indigenous to the British Isles, and it is stated, on an uncertain authority, to have been introduced into England from Cyprus in the reign of Richard I. It is now so perfectly naturalised that birds having the full power of flight remain in the country.”—(Newton).

Like many other birds, Mute Swans flock together in winter, although only on a small scale. The numbers to be found at Hogganfield, just east of Glasgow, where a small swannery exists, and on the lochs further eastwards, are greatly in excess of those at Possil Marsh, the conditions being quite different. I believe a few of the marsh swans do come from there, but the majority are the isolated birds of the district.

Like some other birds, swans possess little peculiarities. It is no uncommon sight to see them standing on one leg, with perhaps the other placed over the back, the foot fully expanded, or to see them with a foot in a similar position floating leisurely about. I have observed cygnets, when only a few weeks old, sailing about with the foot over the back, which shows that this habit is learned when very young.

After the departure of the winter visitors no intruders will be tolerated on the marsh. Soon both birds, which are paired for life, may be seen prospecting for a site for their new home. Sometimes after the nest has been begun it is abandoned, for what reason I know not, and a new site procured. Both birds work diligently at the foundation, but after a while the female occupies the nest for the remainder of the time,

the male bird carrying all the material to her. In a short time a great accumulation of vegetable matter has been brought together in the completion of the nest. I have never heard of the eggs exceeding six in number here. Incubation lasts from five to six weeks, and during that time it is interesting to watch the devotedness of the sitting bird's faithful mate.

The resident birds, when sure that they had seen the last of their winter visitors at the end of February, 1909, started prospecting, and nest building began about the end of March. Sitting began about the middle of April, and continued till about the middle of June. On the 4th July the swans were seen on the water accompanied by one cygnet. From this I would take it that early in the year the nest had been robbed. The careful attention of the parents towards the young one was extremely interesting to watch. Whether they had been scared at the beginning of August or not I can't say, but they cleared out during the first week. At the end of August the male bird came back and remained about for a little, and again disappeared. Perhaps he was seeing if it would be safe for the return of his mate and offspring. They had only withdrawn to the swampy marsh at Kenmure, where I often saw them.

Towards the end of the year the number of swans increased, but it was not until the 13th January, 1910, that I again saw the two swans and cygnet together. As the year wore on the number of swans fluctuated greatly till the 6th March, when six including the cygnet, remained. This number remained steady till the end of the month, and on the 3rd April only four adults remained, and the construction of a nest began. By the 6th April only one pair of swans was to be seen, and on the 17th a new nest had been begun, and the old nest allowed to waste. Which of the pairs had built the first nest I am unable to say. Up till a few years previous to this there used to be two pairs. The mate of one of the pairs met with a tragic end, still its partner remained about alone until the arrival of the winter visitors. There is some difficulty

here as to whether this was the mate that had returned with another partner or another pair. Whatever the circumstances were, I think it is clear that the resident birds resented the presence of another pair on the marsh, and as the result of persecution the new arrivals cleared out. The nest building continued, and on the 8th May I noticed the female sitting. She continued sitting close till the 22nd, when both birds were seen on the water. The nest appeared to be empty. I had a suspicion that the nest had been robbed. However, both birds remained about till the middle of June, when they disappeared. On 3rd July one was seen on the canal. On 31st July two swans were noted on the marsh. These had returned during that week, but they were away again within the following week, nor did I see swans again till the 28th August, when a pair with five cygnets were noticed on the canal. These, I expect, would be the pair that left at the beginning of April, and they would be taking careful survey before venturing on the marsh. During the first three weeks of September a pair of swans was noted. These I take to be the local pair of birds that had returned, and, of course, the other pair with their brood were off. On the 2nd October there were eight swans and three cygnets; 16th, one pair and three cygnets; 22nd, one pair and one cygnet. This was the last I saw of the cygnets. On the 30th five swans were noted. During November my visits were few, and I failed to see the swans on any of the dates. In December I never saw more than six swans.

The increase in number during the next two months was slow, and reached the highest mark on 26th February, 1911, with thirteen. These seemed to leave very quickly, for when I visited again on the 4th March only a pair remained, these evidently being the local pair. By the end of the month nest-building had begun. The pile continued to increase, but it was not till the second week in April that the female began to sit, and I think about this time the nest was harried. On the 13th April I witnessed one of many such incidents that take place. A pair of swans, from their plumage evidently young

birds, came from the east just about sunset. Immediately these landed the resident birds came tearing through the water at full speed; a magnificent spectacle! The two visitors seemed quite aware of the hostile reception that was coming. They showed signs of fear, and began to swim about excitedly, and to seek shelter amongst the reeds. Just as the residents were making a rush at them they took to the wing. The male bird also took to the wing, and pursued them well over Kenmure. On his return to his mate what a piece of trumpeting there was as they sailed about spread out in their glory. However, in a few minutes it was all a thing of the past, and they settled down again to their leisurely ways.

In a few days after this incident they began another nest, but it was not till the beginning of May that the female took to sitting, but never closely. During the month of May a few of the members of this society visited the marsh for dredging purposes. On our first evening—the 12th—we found the nest contained three eggs, and on our last visit on the 2nd June the nest still contained the three eggs.

During the last fortnight in June I saw the pair swimming about alone, after which they disappeared, nor did I see them again till the end of August. Again I feared the worst had happened, and I heard from some school children that the young ones had been done to death by some boys. The stay of the old birds this time seemed to be for good, as they were seen about during the months of September, October, and well into November, until the arrival of the winter visitors. The keen frost that prevailed at this time had its effect upon the marsh. On 21st November twenty-one swans were noted, including six cygnets. During the following months the numbers fluctuated greatly. On 28th January, 1912, as many as twenty-two were noted. Shortly after the beginning of February little more than a dozen remained. On my visit on 10th March there were still fourteen, and about a week later only a pair were left. By this time the long wintry weather was past. For the next two or three weeks the swans were to be seen prospecting for house building, which they began

about 12th April. By the 27th the female had been sitting closely for a week, and remained so till the first week of June. On the 16th the pair appeared on the open water accompanied by a brood of five cygnets. Fortunately Mr. G. Lunam was successful in securing some fine pictures of this happy brood, and many of us have had the pleasure of seeing them on the screen. About the beginning of July only four cygnets were noted.

Many fine sights did I witness during the rearing of this brood that demonstrated the most exquisite tenderness and devotion on the part of the parents. Soon after they were able to be left alone to do for themselves the parents indulged in short flights together, but were never away for any length of time. On the 11th August a pair were to be seen swimming about the canal, though they made no endeavour to land on the marsh. I could see no signs of swans on the marsh, so whether they were visitors to the place or not I can't say. As an instance of devoted care I will quote another extract from my diary. "On the 17th August the two adult swans, for about an hour and a-half, kept the open ridge of some dense reeds, amongst which their two cygnets were safely hidden. Within range was a gunner, on whose every movement they kept a watchful eye. Whenever he left, and they were out of range, the four took to the open water. On the gunner again returning they immediately took to the reeds, where the cygnets disappeared, the parents again taking up guard. Personally, I knew that this man would be the last to kill the swans, yet I could not keep from thinking that by the gun the other cygnets had met their fate. Hence the zealous way the parents guarded the remainder of their progeny."

I could find no trace of them on the following day. Evidently they had gone to where they considered themselves safer. It was not until a week after that I saw the male alone on the water. At the beginning of September they both appeared with the two cygnets. A week later another adult appeared, and on the 22nd there were four adults, but only

one juvenile. On the 6th October six swans and two cygnets were noted, and during the week another swan arrived. From then till near the end of December, although I continued to visit the marsh weekly, I always found the seven adults and two juveniles. Even on 1st December, when the marsh was frozen over, this number could be accounted for either on the marsh or on the canal. On the 29th December I found the number had increased to seventeen. Unfortunately I was unable to visit the marsh before the 9th February, 1913, when I found six swans. These gradually dwindled away, and at the end of the month a pair only remained.

By the middle of March they had begun nest-building, but seemed to be making slow progress. By the second week of April the usual large structure had been erected. Up till then I could see no signs of sitting, but from that onwards the female sat close. On the 8th June, whilst she was still sitting, I thought I saw a young bird at the edge of the nest, but I could not be sure about it.

A day or two later I found both birds swimming about alone, nor did I ever see them again near the nest. They continued so until about the end of June. All this time the object was lying at the edge of the nest, and had now become an eyesore to me, through not being able to say what it was. Through time it disappeared. On the 22nd another pair of swans attempted a landing, but were hastily beaten off. My view is that the sitting was destroyed by a severe thunderstorm at the beginning of June. Whatever the truth may be, the fact remains that they were unsuccessful in rearing a brood. About the middle of July they disappeared, and although I had visited the place many times subsequently it was not till the morning of 7th September that the pair of swans returned, and I happened to be present then. I learned that they had not been seen during the interval. Their stay during September was rather unsettled, as they continually made flights to Kenmure, where they had likely been during the few weeks previous. Returning on 5th October I saw four swans, and in the course of another three weeks they had

increased to six. Towards the end of the month the weather became bad, and on the 26th I found that the number had increased rapidly to sixteen.

During November and December the weather still continued wet and wild, the effect of which was very noticeable on the number of swans present on the marsh.

During November the numbers fluctuated a little, reaching a maximum of twenty-three on the 30th, the greatest number I have yet observed on the marsh.

In the opening days of December the numbers fell to seventeen, and continued off and on about that till the end of the month. Returning again about the middle of January, 1914, I found the numbers still about the same, but after that they decreased, and on the 1st February only six remained. But in the course of a day or two the two residents were again in sole possession of the marsh. It was not until the second week of March that I noticed that they had begun nest-building. The nest by this time was a fair size, and its position amongst the reeds rendered it very inconspicuous, hence my failing to observe it earlier. I noticed on the 16th April that the bird was sitting. One may guess what my feelings were on learning two days later (Saturday, 18th), that the nest had been harried, and the two eggs gone. However, the birds did not desert the nest, for I failed to find the female off the nest from the 23rd April till the beginning of June, and she was still adding to the nest on the 31st May. On the 14th June I saw both birds accompanying a single cygnet, so from that I would suppose that an egg had been deposited soon after the other two had been taken.

During the month of July and first half of August the pair of swans and the cygnet could be seen daily moving leisurely about the reeds, and at other times basking in the sun. For some time after this only the female and cygnet were seen together, the male evidently having gone away on his own.

Returning on 4th October I found that sometime during the previous fortnight the male bird had returned. Accompanying the pair of swans and the cygnet on the water were other five adult swans, evidently the beginning of the winter

visitors. Three of them had left again by the 11th, nor did an increase take place till the following fortnight, when the female and cygnet and four adults were noted.

The winter months of 1913-14 was an interesting one as regards the swans, the outstanding feature being the predominance of immature birds, which was entirely contrary to former winters.

During the first fortnight of November, in addition to the local birds, were other five adults and two juveniles. On the 15th this number was further augmented by a pair and four cygnets. They were observed earlier in the morning on the canal, but during my stay they came into the marsh. When I returned on the forenoon of the 22nd the only signs of swans that I could see around me was a single cygnet on the canal. In December the numbers remained fairly steady at ten (six adults and four juveniles). On the 10th January this year a dozen birds were noted, the majority immature. These gradually diminished as the month wore on, and on the 31st only the local pair and their cygnet were observed. On the 7th February I was rather surprised to observe thirteen swans, and at the same time I was highly delighted at finding that six of these which kept by themselves were Bewick's Swans, this being my first personal experience of them at the marsh. On the 14th the local pair and three immature birds were noted. The local cygnet had disappeared some time during the week. I found on the 21st that another increase of immature birds had taken place, there being seven and one Bewick's Swan. From this onwards till the third week of March, the resident birds being now freed from parental cares, were engaged in one continuous battle to regain the supremacy of the marsh. On the 14th March there were thirteen immature birds in various stages of plumage, six of them had almost attained their pure white adult plumage. A pair amongst these were indulging in what was doubtless their first love affair. Their billing and cooing was both interesting and amusing to the observer, but not so to the resident birds, who seemed to abhor such ongoing, and who seemed to have specially marked out these lovers for combat. It was

quite apparent that they had a heavy task, still they lagged not, and the numbers were reduced to six by the 21st. These they still kept harassing unmercifully, and they were forced to clear out before the 28th.

At last they had again established themselves as the lawful tenants, and after what seemed to be a few days contented rest, prospecting for the site for the new nest took place. On the 14th April the foundation was laid, and seldom was the female seen off her nest till the 6th June, when both parents were observed in the water accompanying a cygnet a few days old.

Visiting on 27th I saw the two adult birds on the canal, but no cygnet. I am unable at present to give any account of the disappearance of the cygnet further than to say that it has not been seen since the beginning of the week. I saw it last on the 20th. With the ever-increasing number of swans now in the district that occasionally indulge in a flight to the marsh during the nesting period, the resident male will doubtless feel that the labours of his careful vigil are becoming more trying as years roll on. Still he faces all comers, he shirks not his duty.

I often wonder what the marsh would be like if the swans were to desert the place, for nothing that I know of could compete with them in gracefulness. Often, for long back until this present crisis, have I cried for protection for the marsh, but it was like a voice in the desert—unheard, unanswered. Whenever the struggles of our country are over, when peace again returns to our homes, then, but not till then, let all our voices be heard appealing.

Excursions.

ERSKINE HOUSE, 23rd May, 1914.—Mr. Laurence Watt, Conductor. There was a fair attendance of members at this excursion and the weather was favourable. A solitary specimen of *Ranunculus bulbosus* was seen. Many common terns were flying over the river. Interest was chiefly directed to the notable trees to be seen within the policies, and Mr. John Renwick supplies the undernoted details regarding them :—

MEASUREMENTS OF TREES AT ERSKINE HOUSE ON 23RD MAY, 1914.

Species.	Locality.	Bole, Ft.	Girth, Ft. In.	At Ft. In.	Girth Increase, Inches.	Years.	Average Rate Yearly in Inches.
Lime,	S.W. of House,	7	16 3½	3 0	Trunk fluted.	4	.37
Sycamore,	E. do.	20	15 11	6 0			
Ash,	S.W. do.	14	15 9½	5 0	Divided into 3 large stems.		
Do. (fallen),	E. do.	18	11 6	5 0	Height, 86ft.	10	.55
Birch,	E. do.	10	8 2	5 10	5½		
Alder,	near river, N. of House,	3	12 4½	1 6	Divided into 8 stems.		
Turkey Oak,	E. of House,	25	8 7½	5 0			
Do.	N.N.E. do.	20	7 11	5 0			
Do.	E. do.	28	7 1½	5 0			
Lucombe Oak,	near Sycamore, E. of House,	30	5 10¾	5 0	3¾	6	.62
Do. (?),	near Chestnuts, E. do.	45	5 2	5 0	Height, 67ft.		
Do. (?),	W.S.W. of House,	18	5 5	5 0			
Sweet Chestnut,	southern of two trees, E. of House,	30	11 11½	5 0			
Do.	northern of two trees, E. do.	25	10 5	5 0			
Do.	near Yew, E. of House,	18	11 4½	5 0			
Cedar of Lebanon,	in garden, S.E. of House,	6	11 0	1 5	6½	6	1.08
Do.	do. S. do.	5	10 8½	1 6	6	6	1.00
Deodar,	do. S.W. do.	15	6 1½	4 6			
Do.	do. S.W. do.	20	6 3¾	5 0			
Scots Pine,	S.W. of House,	16	9 5	6 3	1	10	.10
Arbutus,	in garden, S.W. of House,	...	5 10	4 0	5	6	.83
Do.	nearer river, S.W. do.	...	4 5½	4 0			

ARDGOWAN, 12th September, 1914.—Mr. Alexander Ross, Conductor. A party numbering eight was met at Inverkip station by the head forester, Mr. Farquharson, and conducted to the Ardgowan policies. Under the direction of the gardener, the gardens were visited and greatly admired. Among the many beautiful flowering plants which attracted attention were some magnificent clumps of a yellow monkshood. *Buddleias* are evidently favourites, and young plants grown from seeds may be seen everywhere. They are in thousands we were told. Some small *Eucalyptus* trees, which are usually grown here under cover, had been transplanted to the open and seemed to be thriving.

In the greenhouses geraniums appeared to be specially favoured by the family, as there were seventy varieties on view, interesting either from their varied flower or leaf forms, their scent, or some peculiarity of growth. The strangest among those which were pointed out to us was one whose stem was covered with spiky thorns. In one of the houses is a fine fruiting fig-tree which is over a hundred years old.

From the garden a visit was made to a new rockery which had just been begun in the spring of this year. In the height above this rockery and near the stately mansion-house are the remains of a square tower which formed part of the ancient castle of Inverkip. During the time Robert the Bruce was fighting for his throne this castle was for some time in possession of the English, and received Sir Philip de Mowbray after his defeat at the hands of Sir James Douglas. From the top of the tower a fine uninterrupted view of the waters and coast-line of the Firth of Clyde was got. On the middle floor lay the remains of an old sundial with the date "1692." It had probably formed an ornament of the old gardens. On the lower vault-like portion, and just above the doorway we came upon and disturbed a healthy specimen of the cave spider *Meta menardi*. Between the tower and the mansion, several plants of the ivy leaved bell flower, *Wahlenbergia hederacea* Reichb, were got in flower. This plant was noted, I believe, on the occasion of the last visit of the Society, but it was not then in flower. As we were leaving the policies a sycamore behind the garden was pointed out by the forester as somewhat peculiar. It lay over at an angle and from the trunk two rooting shoots had grown downward, so that the tree now appears to be supported by two stumps thrust under the stem.

The day was unfavourable for entomological work, and nothing worthy of note concerning the birds occurred.

Among fungi noted by Mr. H. G. Cumming was *Polyporus intybaceus*, which he says is not a very common species. The following information relating to trees is supplied by Mr. John Renwick :—

MEASUREMENTS OF TREES AT ARDGOWAN, 12TH SEPTEMBER, 1914.

Species.	Locality.	Dole, Ft.	Girth, Ft. In.	At Ft. In.	Girth. Increase, In.	Years, Incl.	Annual Rate, Inch.
Sycamore,	on right of road from South Lodge,	10	14 10 $\frac{1}{2}$	4 4	9.5	11	.86
Field Maple,	at Garden Gate,	3	12 8	1 0	5.5	11	.50
Strawberry Tree,	Lawn,	—	7 10	6 to 12 in.			
Ash,	near Old Tower,	7 $\frac{1}{2}$	13 9	2 4	3.5	11	.32
Ash,	near South Lodge,	20	12 6	5 0			
Walnut,	N.E. of Stables,	10	8 11	5 0	10	11	.91
Hornbeam,	W. of Tower,	10	7 6	4 4	5.5	11	.50
Holm Oak,	N. of House,	5	7 0	2 4	5	6	.83
Do.	Lawn,	8	5 7 $\frac{1}{2}$	5 0	2	6	.37 ^k
Do.	Park, front of House,	45	4 3 $\frac{3}{4}$	5 0			
Sweet Chestnut,	Do,	10	14 4 $\frac{1}{2}$	5 4	11.75	11	1.07
Do.	Do,	10	12 3 $\frac{1}{2}$	4 10	9.5	11	.86
Cedar of Lebanon,	Lawn,	20	9 0	5 0	10.5	11	.95

° Height, 43 feet.

GLEN FALLOCH, Monday, 28th September, 1914.—Mr. J. R. Jack, M.I.N.A., Conductor. It was intended to walk from Crianlarich down the glen to Ardlui, but owing to the restricted train service it was necessary to reverse the route.

The day began with dull sky and a suggestion of rain, but it rapidly improved, and when the party of four members arrived at Ardlui the sun was shining brightly over the head of Loch Lomond. For the first mile the road winds through a wood, in which were numerous mosses and fungi, mostly of the commoner species however. On the open roadside—its favourite haunt—was a fine patch of Don's Slender Rush, *Juncus tenuis* Willd. The present is the second record for Dumbartonshire (v.c. 99). The spread of this interesting plant is remarkable. Two years ago there was a good display of it in Glen Croe, and it had survived the landslide, as I found it in good condition in July of this year in the same place.

At Inverarnan there is a fine specimen of *Clematis vitalba* L., which was in flower. The plant rambles over the whole front of the old house and has done well for many years. Dumbartonshire was left here and Perthshire entered, and shortly afterwards the road which till then had been nearly level at little more than 50 feet above the sea, though over 30 miles from the mouth of the River Leven, where the waters of the Falloch enter the Clyde—began to rise steeply, while the river tumbled in foaming cascade over its rocky bed. From this point to the Falls every bend of the stream disclosed a new picture—here a pool, deep and still, reflecting the green leaves of the alder, the scarlet fruit of the rowan, and the blue and white of the sky above; there a rocky ledge round and over which the foam-flecked waters danced and swirled, almost as if annoyed at the restraint imposed by the rocky banks. Anon the valley opened and again the river ran peacefully over its stony bed, and save for the tall mountains in the background, the scene might have been on an English stream. Again the rocky gorge, the rushing, foaming waters, and then the Falls. Though neither of great height nor volume of waters the Falls of Falloch are ever a source of delight. In the spring, when the river is swollen with the melting snows of the mountains, it is good to come here and listen to the music of water falling into the deep pool and singing among the boulders

as it hurries down the glen to Loch Lomond and the far Firth of Clyde. The buds are swelling on the trees and golden catkins glisten in the sunshine as the willow branches wave in the breeze. In the full heat of summer the stream, then much reduced, tinkles gently among the stones, wild flowers abound on every side, and a wealth of foliage clothes the steep eastern bank. Sturdy oak, with dense masses of leafage, graceful birch swinging pendulous branches to the wind, stately pine and lissom larch contrasting in their sombre shades with the rippling sparkle of the aspen, each different from the others, but all beautiful. And now, when Autumn spreads her glowing colours on the scene—russet of the oak, golden yellow of ash, crimson rowan, green and yellow aspen, orange birch, and a background of brown withered bracken—the picture is pressed deep on the mind and will remain a sweet memory till returning spring begins the cycle anew.

On leaving the Falls, there was noted in a pool *Sparganium minimum* Bonh., which was first recorded from this same spot by Mr. G. Lunam some years ago. From this point onwards the Glen opens out, and while the foreground is less interesting, both botanically and pictorially, the views of the mountains become more impressive. An Caisteal, Cruach Ardran, and Ben More, to mention only a few, stood out in the clear light of the afternoon, each ridge and corrie clear to the summit being seen in a manner all too rare. Crianlarich was reached in good time, and the return journey begun by the West Highland train as the daylight died in a riot of crimson and gold. Darkness fell before leaving the peaceful banks of Loch Lomond, and the only jarring note of the day was struck as the train swung round to Loch Long side, and the brilliant lights of the Torpedo Station proclaimed that there men toiled day and night to perfect engines of destruction, because what *might* have been a great and good nation had suddenly gone back to a savagery that would have brought a blush even to the hairy cheek of the Pithecanthropos.

Mr. Lee has favoured me with a list of the mosses noted:—*Sphagnum subsecundum* Nees, var. *turgidum* C.M.; *Catherinea undulata* W. & M. (fertile); *Polytrichum gracile* Dicks; *Fissidens osmundoides* Hedw. (fertile); *Webera annotina* Schwgr; *Thuidium delicatulum* Mitt.; *Eurhynchium myosuroides* Schp.

Tipulidae were in great number in the wooded part of the Glen from Loch Lomond as far as the Falls of Falloch, but they were mainly of two or three species. *Dicranomyia chorea*, Mg., *Rhypholophus hæmorrhoidalis*, Ztt., and *Tipula signata*, Staeg., were in great abundance, there being more of the last species flying about than I have seen at any other time. The following is a complete list of the species taken:—*Limnobia quadrinotata*, Mg., one ♂, rare; *L. nubeculosa*, Mg., few; *Dicranomyia modesta*, Mg., few; *D. chorea*, Mg., abundant; *D. dumetorum*, Mg., one ♂; *Rhipidia maculata*, Mg., few; *Empeda nubila*, Schum., few; *Molophilus propinquus*, Egg., one pair; *Rhypholophus nodulosus*, Mcq., two ♂♂; *R. varius*, Mg., few; *R. hæmorrhoidalis*, Ztt., abundant; *Erioptera taenionota*, Mg., few; *Limnophila nemoralis*, Mg., few; *L. (sepium?)*, Verr., one ♀; *Trichocera hiemalis*, Deg., few; *Amalopsis immaculata*, Mg., frequent; *A. unicolor*, Schum., one ♂; *A. littoralis*, Mg., one ♂, a local species; *Tipula signata*, Staeg., abundant; *T. marmorata*, Mg., one ♂, rare; *T. scripta*, Mg., one ♀. List supplied by Mr. A. Ross.

Birds were not numerous. A flock of about fifty mistlethrushes was observed flying across the middle of the Glen, and resting on some low bushes on the west side, while near the head of the Glen a pair of ravens were noticed flying eastwards. The stonechat was also seen.

ARROCHAR, 3rd-5th April, 1915. — Report by Mr. John Paterson. A small group of members of the Society spent the Easter week-end at Arrochar, and were joined on Monday by Mr. J. R. Lee. The weather was middling, but not at all intolerable, and what was proposed to be done was never interfered with on this account. In ornithology, there is nothing outstanding to record, although the limits naturally to be expected being borne in mind, it could not be said that interest in this branch ever died down. It is an attractive season to the ornithologist, who is saluted with a chorus of voices before he gets up. Among matters perhaps deserving mention, although some of them were not unlooked for, was the presence of a number of Lesser Black-backed Gulls, the first of our summer birds to arrive, and the only one seen during our

visit. The abundance of the Grey Wagtail by loch and stream strikes one in visiting the region we were in, and what seems a permanent colony of the Stonechat was in full numbers, according to Mr. Ross. This colony occupies the furzy patch between the Torpedo Station and Ardgartan. On Crois, on the Monday, I heard the Snow-Bunting when we were below the crags of the great corrie between Ben Narnain and Crois, and later when almost on the top of the crags (about 2,700 feet) Mr. Lee and Mr. James Paterson being well in front, and the writer well behind, we were all greatly delighted to get in the still clear air a fine performance of the song of this species, a rippling silver-bell-like note which reverberated among the crags, or rather got that quality which bird-songs seem to acquire when they get great craggy sounding-boards.

A matter of interest to botanists at the early time of our visit is the flowering of the Purple Saxifrage. This we found in beautiful condition at 1,350 feet on Crois, and thereafter (though hardly ever again as fine as the first clump) all the way to near the top. Many mosses were looked at by Mr. Lee, but nothing new was met with.

Just at the foot of Crois, Mr. Lee called out that here was something curious. It proved to be a Lizard (*Lacerta vivipara*) which had come out on a dry bank to sun itself, but it very quickly disappeared into its hole when disturbed. I have been unable to get any definite information about first appearances of lizards for the season in our neighbourhood, which seems to justify drawing attention to this occurrence, but Mr. James Bartholomew, one of our members, tells me that he saw two adders (*Pelias berus*) killed at Kinnelhead, his farm in Dumfriesshire, on 1st April, where three were killed the day before. "This is not early for adders," he adds, "they are often got in February." Mr. Robert D. Wilkie, a former Secretary of the Society, who was for some time much interested in this class, tells me also that on the date on which we saw the lizard he found a lively slow-worm (*Anguis fragilis*) at 800 feet on the Trossachs Road, about four miles from Aberfoyle.

The district which was the scene of our Easter week-end ramblings is known to be fruitful in interest, although it is not expedient to try to set all these things out here and now.

Review.

Bulletin of the British Ornithologists' Club, Vol. XXXIV. (Witherby & Co., London).—This volume contains the report of the Migration Committee appointed by the Club to deal with the immigration of summer residents in the spring of 1913; also notes on the migratory movements and records received from lighthouses and light-vessels during the autumn of 1912. Considerable numbers of summer residents, it appears, passed the winter of 1912-13 in the south and west of our islands, and a good many of the early records in January, February, and the first half of March are believed to be connected with this unusual state of ornithological affairs. The temperature during March being above the average and unusually uniform, led, it is believed, to several different species which are usually regarded as stragglers only at that season appearing in quite unusual numbers. A temporary lull in the migratory movement noted on the 11th of April, coincided with a fall in the temperature. The longest periods of migration, which run with our summer immigrants to quite two months, were exemplified in the case of the swallow, which extended from 8th March to 20th May, the sand-martin from 13th March to 15th May, the chiffchaff from 6th March to 8th May, and the wheatear (both races) from 12th March to 12th May. Those occupying the shortest time were the reed-warbler (18th April to 5th May), wood-warbler (9th April to 11th May), and nightingale (13th April to 5th May).

The early dates at which a good many species begin to take their departure in autumn provokes the following comment in the Introductory Note:—"It becomes clear, the further investigations are carried, that the interval between the termination of the spring migration and the commencement of the autumn movement is an extremely short one." Another point emphasised is the "enormous migrations reported during the first three weeks of November, which seem to have exceeded those recorded in October."

The present volume is the ninth of its kind. It is intended to issue one during 1915, after which the results will be summarised in a final volume. There is no reason assigned for the discontinuance of the series, but the issue of a digest will be very welcome, and it is to be hoped that the present distressing condition of public affairs may not interfere unduly with the consummation of the Committee's laudable intentions.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VII., No. 4.]

[December, 1915.

Some Additional Notes on the Birds of Islay.

By ALEXANDER ROSS.

[Read 29th June, 1915.]

THE following are notes of additional localities for some of the species mentioned in my former paper.* I have also included records of certain species which are given in Robert Gray's *Birds of the West of Scotland*, though I have never observed them myself in Islay.

LONG-TAILED TIT (*Acredula rosea*). "It is found also on some of the inner islands, being rather common in Islay, as I have been informed by Mr. Elwes." (*Birds, West Scot.*, p. 107.) I have not seen this species in Islay, and I am doubtful if it occurs at all.

GREY WAGTAIL (*Motacilla melanope*). Till the end of the summer of 1913 I had seen only one bird of this species. Last summer I observed one in a wet hole in a field near Portellen on the 6th August. On the 20th I noted a family on the Kilnaughton Burn near Cragabus, and on the 28th a single bird was seen on Lagavulin Burn.

SAND-MARTIN (*Cotile riparia*). On several occasions, in 1914, this species was seen flying about Laphroag, but I failed to find the nesting place.

* *The Glasgow Naturalist*, Vol. VI., pp. 7-32.

CHOUGH (*Pyrrhocorax graculus*). I discovered another nesting place to the north of Portnahaven on the 29th of July, 1914.

MAGPIE (*Pica rustica*). "It is wholly unknown in the Outer Hebrides, but is occasionally seen in Islay and Mull, where, however, it does not breed." (*loc. cit.*, p. 185.)

CARRION-CROW (*Corvus corone*). This species, which is now rarely seen in Islay, was noted at two places between Port Charlotte and Portnahaven on 29th July, 1914.

ROOK (*Corvus frugilegus*). Dr. Gilmour informed me that there is an error in Mr. Harvie Brown's *Fauna of Argyll, &c.*, with regard to this species. There never was a rookery at Kinnabus, where there are no trees, and my visit to that place was fruitless. The rookery described by him was at Cornabus, and was destroyed in 1885 or 1886. There is still a small rookery there, as I saw over twenty nests in the wood at the farm on 23rd August last year.

HEN-HARRIER (*Circus cyaneus*). Mr. R. H. Read, in a letter to Mr. John Paterson, dated 14th February, 1902, writes:—"I have eggs from Islay, but they were taken about 1870."

KITE (*Milvus ictinus*). "Mr. Elwes informs me that in Islay it is still seen, but rarely, flying over the island." (*Birds, West Scot.*, p. 43.)

ICELAND FALCON (*F. islandus*). One which was shot in Islay is now in the Museum at Islay House. (*loc. cit.*, p. 22.)

AMERICAN BITTERN (*Botaurus lentiginosus*). Howard Saunders records this species from Islay. (*Manual of British Birds*, p. 385.)

BITTERN (*B. stellaris*). Mr. Gray (*Birds, West Scot.*, p. 279) states that it has been shot in Islay.*

* See my paper, *The Glasgow Naturalist*, Vol. VI., p. 21, for Mr. Scot Skirving's statement regarding this species.

GLOSSY IBIS (*Plegadis falcinellus*). "1903" in my former paper should be "1902." The bird was shot by Mr. Reid, late factor of Kildonan estate.

WHITE-FRONTED GOOSE (*Anser albifrons*). See Gurney's article in the *Ibis*, April, 1902, p. 274.

BEWICK'S SWAN (*Cygnus bewicki*). In a footnote, p. 150, in *The Moor and the Loch*, 1888 edition, appears the following:—"My two youngest sons went to Islay in January, 1880, for a few days' wild sport. One of them knocked over two Bewick's swans, right-and-left; while his brother, who chose the other end of the loch, had the good fortune to kill another, about a hundred yards distant, with his rifle. These were their only chances at swans. They were the guests of Mr. Campbell of Balinaby."

SCAUP DUCK (*Fuligula marila*). "It is likewise seen occasionally on the shores of Islay." (*Birds West Scot.*, p. 386.)

LONG-TAILED DUCK (*Harelda glacialis*). "In the winter season" it is "met with in considerable numbers off the coasts of Skye, Mull, and Islay." (*loc. cit.*, p. 388.)

VELVET SCOTER (*Ædemia fusca*). "Several small flocks were seen by Mr. Elwes on Loch Indaal in Islay, in November, 1867." (*loc. cit.*, p. 381.)

SMEW (*Mergus albellus*). "Mr. Elwes informs me that in Islay it is a very rare winter visitor." (*loc. cit.*, p. 397.) Gray also says (*loc. cit.*, p. 398) that he examined a fine male, shot in February, 1868.

TURTLE DOVE (*Turtur communis*). "In the Hebrides specimens have been shot in Islay." (*loc. cit.*, p. 223.)

KNOT (*Tringa canutus*). "It has occurred in Islay, as I have been informed by Mr. Elwes." (*loc. cit.*, p. 318.)

GREENSHANK (*Tringa canescens*). "The Greenshank is not uncommon in Islay and Jura, especially about Loch Indaal

and the shores of some fresh-water lakes. I have, however, failed to discover any breeding station on either of these islands." (*loc. cit.*, p. 301.)

COMMON TERN (*Sterna fluviatilis*). In my paper I noted the gradual diminishing of this species from its great nesting place on Tarrsgeir till its total disappearance in 1913. Last year, I am glad to say, it reappeared there, forty birds, at least, being seen on the islet on 9th July.

ICELAND GULL (*Larus leucopterus*). "Mr. Elwes informs me that the Iceland Gull is a rare winter visitor in Islay." (*loc. cit.*, p. 485.)

COMMON GUILLEMOT (*Uria troile*). This bird was exceedingly rare during 1913. In 1914 it was to be seen near Texa, at the Mull of Oa, in Claggain Bay, and at Sanaig, but not in anything like its former numbers.

RED-THROATED DIVER (*Colymbus septentrionalis*). A pair of these birds were seen swimming about on Ballygrant Loch on 30th July.

GREAT-CRESTED GREBE (*Podiceps cristatus*). "Mr. Elwes informs me that he has observed it once or twice on Loch Indaal, Islay." (*loc. cit.*, p. 405.)

On the 31st of July, 1914, I visited the famous Sanaig Rocks. These form a series of precipitous cliffs, nearly perpendicular, and extending for a distance of at least two miles. They are cut here and there by deep fissures, which go down almost to the water's edge, and from the bottom of these crevices one has abundant facilities for observing the nesting places of the sea-birds. The shore is of the most dangerous character, ragged and jagged rocks forming a long fringe at the foot of the tremendous cliffs, and the whole forming an ideally safe nesting site for rock-birds.

The day of my visit was rather dull, and a haze prevented me from seeing to any great distance. I was also labouring under another disability, as I had on boots without tackets,

and descending the crags was a matter of toil and difficulty. However, I got down one gully to a place from which I got a good view of the nests of many of the birds. Puffins feeding their young were almost at my hand. Numerous Cormorants and Shags were performing the same operation, and flocks of these birds were resting on the waters below. A few Common Guillemots flew in and out from the rocks, but I was unable to find one Black Guillemot. A few Eider Duck, one Razor-bill, numerous Redshank, many Rock-Doves, and five species of Gull were also seen during the short time I spent there.

Sanaig appears to me to be a much more extensive breeding place for sea-birds than the Mull of Oa, and I was sorry I was unable to go back and explore the cliffs under more favourable conditions.

The following interesting item regarding the estate of Kildalton and Oa appears in an advertisement in *The Times*, London, 23rd April, 1914:—"The sporting facilities are exceptional, and afford a great variety of game. 30 to 40 stags, and as many as 900 brace of grouse, 460 woodcock, and 50 snipe have been killed in a season."

The Occurrence of *Claytonia sibirica*, L., in the Clyde Area.

By ARCH. SHANKS.

[Read 29th June, 1915.]

THIS garden outcast, formerly known as *Claytonia alsinoides* Ph., appears to be first recorded as naturalized in the Clyde Area in Henny's *Clydesdale Flora*, 3rd edition, 1874. The places mentioned are Gourock, Rothesay, Helensburgh, and Lanark. The plant still flourishes at the two former stations, but I have not heard of any one finding it at the two latter.

In a report of an excursion of this society to Barskimming, Mauchline, Ayrshire, in 1891, Mr. John Renwick includes it in the list of the plants noted. In the *Annals of the Andersonian Naturalists' Society*, published in 1893, the plant is recorded for Castle Semple, Lochwinnoch. The Society had visited this estate in 1888 and in 1890. In 1896 the late Rev. Dr. Landsborough reported it from Robertland, Stewarton, Ayrshire, and it was also found that year by me at Swindridgemuir, Dalry, Ayrshire. Since then reports have reached me of its occurrence at Skelmorlie (Robt. S. Houston), Kilchattan Bay (Robt. Henderson), Cambuslang (Thos. Hill). Last year I found it near the old Saw Mill, Erskine, and this year on the banks of the Rotten Calder near Newton. The popular name for the plant in America is "Spring Beauty."

ADDENDA.

I am indebted to Mr. John Renwick for several additional references. In the *Transactions of the Glasgow Society of Field Naturalists*, a Botanical Report by Messrs. R. M'Kay and G. Horn, dated 1872-3, contains the following reference:—"Of native species not previously recorded, the following have been authenticated . . . *Claytonia alsinoides*, naturalised near Cloch . . ."

The following new records have been received:—Balloch (Geo. Lunan) and Sandbank (Alex. Ross).

REFERENCES IN LOCAL PUBLICATIONS.

Transactions of the Glasgow Society of Field Naturalists—
1872-3, p. 13; 1873-4, p. 31.

Hennedy's Clydesdale Flora—
1874, 3rd edition, p. 66.

Transactions of the Natural History Society of Glasgow—
Vol. IV, p. 18; Vol. V, p. 83.
Vol. II (New Series), p. 313.
" III " p. liii.
" III " p. lxxv.

Annals of the Andersonian Naturalists' Society—
Vol. I, p. 36.

Annals of the Kilmarnock Glenfield Ramblers' Society—

No. 2, p. 21; No. 5, p. 35.

The Glasgow Catalogue of Native and Established Plants—

2nd edition, 1899, p. 22.

Fauna, Flora, and Geology of the Clyde Area—

1901, p. 115.

Proceedings of the Society.

THE first meeting of the sixty-fourth session of the Society took place in the rooms, 207 Bath Street, on 29th September, 1914, Mr. John R. Lee, President, in the chair.

Before opening the business the President made appropriate reference to the state of war in which the country found itself, and also to the reported loss of the members of the Stefaansson Expedition

Mr. John M'Naught, Benrig, Kilmaurs, was elected as an Ordinary Member.

Mr. J. G. Connell, F.R.M.S., reported on an excursion to Cumbrae, and Mr. John Renwick on one to Fullarton, Troon (Vol. VI, pp. 109-111).

The President reported on the excursion at Glasgow Fair to the districts round Tyndrum and Crianlarich (*loc. cit.*, pp. 107-109).

Mr. Jas. Simpson, M.A., exhibited *Lycosa tarantula* got among bananas in Glasgow.

Mr. John Gloag exhibited *Hymenophyllum unilaterale* Willd., from Loch Riddon, and the President the much rarer *H. tunbridgense* L., from the same district. The President also exhibited specimens of *Juncus tenuis* Willd., from Ardlui, where it was found growing plentifully along the roadsides. This is the second record of this plant from Dumbartonshire.

From Heriot, Midlothian, Dr. Johnstone Macfie sent for exhibition specimens of the Giant Saw-fly (*Sirex gigas*).

Messrs. J. R. Thomson, F.R.I.B.A., and W. R. Baxter exhibited autochrome lantern slides of topographical and natural history interest.

The sixty-third Annual General Meeting took place on 27th October, 1914, Mr. John R. Lee, President, in the chair.

The Council's Annual Report showed a successful year. The membership, which is 247, is made up as follows:—Hon. Members, 14; Corresponding Members, 30; Ordinary Members, 203 (which includes 21 Life Members). There are 3 Associates.

The obituary records for the year contain the names of Rev. David Landsborough, LL.D., and Mr. Peter Cameron, F.E.S., both Corresponding Members, and Mr. Peter Ewing, F.L.S.

Mr. William Rennie was appointed to fill Mr. Ewing's place in the Council of the Society.

Office-bearers were elected as follows:—President, Mr. W. R. Baxter; Vice-President, Mr. J. R. Jack, M.I.N.A.; Hon. Secs., Messrs. A. Ross and G. Lunam; Hon. Treasurer, Mr. John Renwick; Hon. Librarian, Mr. James Mitchell; Hon. Editor, Mr. John Paterson. As Members of Council:—Messrs. D. A. Boyd, J. R. Lee, and D. Macdonald. As Auditors:—Messrs. Joseph Sommerville and James Jack. Mr. R. S. Wishart, M.A., on the recommendation of the Council, was elected an Honorary Member.

The report of the Hon. Treasurer (Mr. John Renwick) was adopted. For Statement of Accounts see p. 120.

Mr. Jas. Mitchell (Hon. Librarian) and Mr. John Paterson (Hon. Editor) reported respectively on the Library and the Society's publications.

Mr. Alex. Ross, F.E.I.S., reported on an excursion to Ardgowan (pp. 90-91), and Mr. J. R. Jack, M.I.N.A., on one to Glen Falloch (pp. 92-94).

Mr. G. Lunam, per favour of Mr. J. R. Lee, exhibited specimens of *Drosera obovata* M. & K., probably a hybrid between *D. rotundifolia* and *D. anglica* (of both of which specimens were shown) from Bridge of Orchy.

Mr. Jas. Dick., M.A., exhibited specimens of the medusa *Lar sabellarum* Gosse, from Millport.

Mr. R. S. Wishart, M.A., sent for exhibition some plants from Kent.

Mrs. P. Ewing reported on the Conference of Corresponding Societies of the British Association held with the French Association at Havre, which she attended as the Society's representative.

Mr. John Paterson read a paper on "Dante and Burns—a Parallel in their treatment of Birds and Trees" (Vol. VI, pp. 70-75).

Mr. Jas. F. Gemmill, M.A., M.D., D.Sc., gave an interesting paper on "The Hydroid Stage of *Lar sabellarum* Gosse" (see pp. 1-2).

Mr. John Paterson communicated a paper by Mr. Hugh Boyd Watt, F.Z.S., M.B.O.U., entitled "Observations on some London Trees" (Vol. VI, pp. 65-70).

The third meeting of the sixty-fourth session took place on 24th November, 1914, Mr. W. R. Baxter, President, in the chair.

Mr. J. R. Jack, M.I.N.A., exhibited many highly successful autochrome studies, including some of Alpine plants and of fungi.

Mr. John Renwick read a paper on "The Spanish Chestnut (*Castanea sativa* Miller) in the Clyde Area" (see pp. 17-31 and pp. 59-61).

The fourth meeting of the sixty-fourth session was held on 29th December, 1914, Mr. W. R. Baxter, President, in the chair.

Mr. James Dick, M.A., 105 Hill Street, Garnethill, was elected an Ordinary Member.

Mr. R. B. Johnstone reported on Fungus Forays to Finlaystone, Carnwath, and Garthland (Lochwinnoch) (see pp. 62-64).

Mr. Ludovic Colquhoun exhibited a buff-coloured Grouse (*Lagopus scoticus*) which was found dead at Moffat alongside a normally coloured bird, both probably killed by lightning.

Mr. Colquhoun, in a lecture on "Some Wild Birds at Home," exhibited a large number of valuable slides by Mr. Chas. Kirk and himself.

Mr. D. A. Boyd read a paper, entitled "Notes on Microfungi observed in the Lochlmond District," with a list of records for that district (pp. 3-16).

Mr. Hugh Boyd Watt, F.Z.S., M.B.O.U., sent a paper on "The American Grey Squirrel in Britain," since printed in *The Field* of 12th June, 1915.

The fifth meeting of the sixty-fourth session was held on 26th January, 1915, the President, Mr. W. R. Baxter, in the chair.

Mr. John R. Lee exhibited some Alpine plants from An Caisteal (see pp. 65-77). The collection of plants exhibited included the following mosses and hepatics:—*Dicranum Starkei* W. & M., *Grimmia torquata* Hornset., *Gymnomitrium concinnatum* Corda, and *Radula Lindbergii* Gottoche.

Mr. D. A. Boyd exhibited some microfungi from Carnwath and Garthland (Lochwinnoch) (see pp. 62-64).

The sixth meeting of the sixty-fourth session was held on 23rd February, 1915, Mr. W. R. Baxter, President, in the chair.

Mr. John Gillies sent for exhibition the egg of a Quail (*Coturnix communis*), found near Dalry, Galloway, by Mr. Wm. Turner, Dalry. Mr. Gillies in his covering letter, dated 1st February, 1915, writes:—"About five years ago a young man belonging to Dalry, Galloway, discovered a Quail's nest near that village. That was in the nesting season of 1910 (or perhaps 1909), and, as far as I remember, the nest contained 10 eggs. Some months later the discoverer of the nest presented me with one of the eggs taken from the nest. That egg I have had in my possession ever since. I am sending it to you under separate cover, &c." In a subsequent letter Mr. Gillies writes:—"It may also be of interest to the

members to know Mr. Turner records the Pied Flycatcher [*Muscicapa atricapilla*] as a regular summer-visitor to the Dalry district."

Mr. R. S. Wishart, M.A., sent for exhibition some plants from Kent.

Mr. Robt. Brown, M.D., F.L.S., read a paper on the species of the genus *Pedicularis* from the Alps, and exhibited specimens of those referred to (see pp. 51-56).

Dr. Brown also exhibited specimens of *Saxifraga diapensioides* Bell., from Mt. Cenis, and *S. caesia* Linn., from St. Moritz.

Mr. John Renwick read a paper giving further notes on the Spanish Chestnut, which are embodied in his paper on this subject (pp. 17-31 and 59-61).

The seventh meeting of the sixty-fourth session took place on 30th March, 1915, Mr. W. R. Baxter, President, in the chair.

Mr. Marcus Calder, M.D., 266 Paisley Road West, Ibrox, was elected an Ordinary Member.

Mr. L. Watt exhibited a number of flowering plants, mainly from Banffshire (see pp. 56-58).

Mr. J. W. Reoch sent for exhibition a notable series of lantern slides illustrating the gabbro and granite areas in Skye.

Mr. Richd. Elmhirst, F.L.S., read some "Faunistic Notes" (see pp. 43-47), and exhibited some of the specimens referred to.

The eighth meeting of the sixty-fourth session took place on 27th April, 1915, Mr. W. R. Baxter, President, in the chair.

Mr. John Paterson reported on an excursion to Arrochar (pp. 94-95).

Mr. H. W. Wilson exhibited lantern slides from photographs taken in Ross-shire, including several of the nest of the Golden Eagle (*Aquila chrysaëtus*). Mr. J. Ballantyne showed lantern slides of East Coast plants, Mr. G. Lunam some from photographs taken in the Channel Islands, and Mr. J. R. Thomson some autochromes.

Mr. J. Ballantyne exhibited the following plants from the Montrose district:—*Astragalus danicus*, *A. glycyphyllos*, *Vicia sylvatica*, *Campanula glomerata*, and *Dianthus deltoides*.

Mr. John Ritchie, jun., submitted a paper (read by Mr. A. Ross, Hon. Secretary), entitled "A Contribution to the Parasitic Fauna of the West of Scotland" (see pp. 33-42).

Mr. L. Watt read "Notes on the occurrence of *Goodyera repens* R. Br., in Scotland" (see pp. 47-48). Mr. Watt also exhibited *Hieracium cæsius* Fr., from old Red Sandstone cliffs at Gamrie, *Goodyera repens* Br., from Aberdeen and Banff, and *Salix pentandra* L., from Possil Marsh, showing destruction of leaf-tissue by an insect.* Mr. Watt, who went to Possil in the middle of August to get autumn leaves of this species, was astonished to see so many of the fertile catkins still on the trees; one tree a little bit out on the marsh was covered with the yellow catkins still entire.

Mr. John Renwick contributed some notes on *Goodyera repens* in the Clyde Area (pp. 49-50).

Mr. W. T. M'Leod gave a very interesting demonstration on the "Bacteria of the Air, Soil, and Water." Quantitative and qualitative bacterial examination of each was dealt with, the more important methods of the bacteriologist were carefully explained, and a large number of microscopic preparations shown.

Mr. James Whitton, Superintendent of Parks, Glasgow, submitted his Annual Report, entitled "Meteorological Notes and Remarks upon the Weather during the year 1914, with its General Effects upon Vegetation." From the data in Mr. Whitton's paper it appears that the rainfall was 34·27 inches (35·24 in 1913). The annual average is, however, 38 inches, broadly speaking. The wettest month was March, with 4·26 inches of rain, November 4·31 inches, and December 5·92, which is somewhat abnormal. June was the driest month,

* I have seen this species of willow similarly affected at Erskine, and have for years been familiar with similarly affected purple willows (*Salix purpurea*), on the side of the Clyde above the bridge at Cambuslang, on the left bank of the stream. These willows are infested with blue and copper-coloured beetles, males and females, I believe, of *Phædon vitellinæ*.

with only 0·53 inch of rain. October, September, and May showed low rainfalls, being respectively 1·12 inches, 1·60 inches, and 1·85 inches. There were 164 dry days (158 in 1913). The barometrical readings were closer in range than in 1913. The highest reading in both years was 30·40 inches. The lowest reading was 28·30 inches, on 22nd February. Temperature was similar to what obtained in 1913. Actual frost was only registered (minimum thermometer in shade) on 30 days, and the sum of it was 123°. The highest reading (maximum thermometer in the shade) was 88°, for 21st July (75° on three days in July, 1913). The easterly group of winds prevailed 85 days, and the westerly group 272 days. For several years now reference has been made in Mr. Whitton's notes to the lessening number of days throughout the year on which easterly winds have prevailed. The sunshine recorder at Springburn Park, which came into operation in June, 1913, showed the following sunshine in the months of 1914:—January, 13·9 hours; February, 22·7; March, 88·8; April, 173·9; May, 120·7; June, 190·3; July, 130·5; August, 159·7; September, 131·3; October, 72·9; November, 42·7; December, 16·3. Vegetation developed slowly, but made rapid progress after June. The harvest owed much to the dry conditions which obtained in August and September. There was promise of an excellent display of bloom in woodland and orchard in 1915.

The ninth meeting of the sixty-fourth session took place on 25th May, 1915, Mr. T. R. Jack, M.I.N.A., Vice-President, in the chair.

Mr. A. Ross reported on an excursion to Craigendoran (p. 110-111), Mr. John R. Lee on one to Dalserf, Mr. James Rourke on a visit the society paid to the Botanic Gardens (p. 111), and Mr. D. M'Donald on one to Loch Chon and Ben Venue (pp. 111-113).

Mr. A. B. Motherwell exhibited *Scrophularia vernalis* L., reared in his garden from seed, also *Piptanthus nepalensis*, the evergreen Indian Laburnum, and *Saxifraga granulata*.

Mr. James Simpson, M.A., exhibited lantern slides to illustrate an account of a visit to Switzerland.

Mr. John R. Lee read a paper on "A Visit to the Source of the River Falloch" (pp. 65-77).

The tenth meeting of the sixty-fourth session took place on 29th June, 1915, Mr. J. R. Jack, M.I.N.A., Vice-President, in the chair.

Reports on excursions to Milton Lockhart (pp. 113-117) and Tolleross Park were submitted.

Mr. R. S. Wishart, M.A., sent some plants from Kent for exhibition, including a thistle leaf with *Trichobasis suaveolii* Lév. on it, also some pears attacked by the larvæ of the Pear Midge (*Diplosis pyrivora*). The affected pears fall off in showers early in June.

Mr. Alex. Ross exhibited *Merodon equestris* var. *validus*, which he had taken during June in the Botanic Gardens, Glasgow.

Mr. Wm. Rennie read a paper on "The Mute Swan at Possil Marsh" (pp. 79-88).

Mr. D. A. Boyd submitted a paper, entitled "Some recent Additions to the List of the Microfungi of the Clyde Area" (pp. 77-79).

Mr. Archibald Shanks read "Notes on the Distribution of *Claytonia sibirica* Linn. in the Clyde Area" (pp. 101-103).

Mr. Alex. Ross read "Some Additional Notes on the Birds of Islay" (pp. 97-101).

Excursions.

CRAIGENDORAN TO CARDROSS, 1st May, 1915.—Conductor, Mr. Alex. Ross.—Following the shore line, which was kept to, except that at Ardmore Point part of the estate was visited, vegetation was found to be much further advanced than round the city of Glasgow. Along the railway embankment *Sisymbrium Thalianum* and *Draba verna* were fairly abundant, and among the stones on the permanent way many plants of *Fedia olitoria* were observed. A ditch, running down the western side and adjoining the gardens at Ardmore, displayed some plants of

Anchusa sempervirens. Both sides of the ditch were covered for many yards with *Petasites alba*. The heron, great black backed gull, and sheld-duck seem to be permanent features of the bird life here, and all three were seen.

BOTANIC GARDENS, 13th May, 1915.—There was a very large attendance at this outing, and the party was conducted by Mr. James Rourke, who was congratulated on his recent appointment as Assistant Superintendent of Parks, Glasgow. Among the plants of interest noted in the gardens was *Lathræa clandestina*, which was growing on the roots of a willow. This is a plant of rather restricted distribution. It is common in the west and south of France, and it is also found in Spain and Italy. Another plant demanding attention was *Juncus effusus* var. *spiralis*, which forms spreading tufts of stems which are most completely twisted into corkscrew forms. In the rock garden *Cytisus Beanii* and *C. Kewensis* made a fine display, and other notable plants were *Tanakæa radicans*, a curious Japanese plant of the saxifrage family, *Ramondia pyrenaica*, one of the Gesneriaceæ, *Dodecatheon media* one of the Primulacæ, a native of North America, *Meconopsis aculeata* with purple flowers, and *Primula Veitchii* with fine rose coloured flowers. Among notable plants under glass to which attention was directed were:—*Semele androgyna*, a climbing shrub with flowers on the sides of cladodes, *Trichomanes venosum*, a pretty filmy fern from New Zealand growing on the stem of the Silver Tree Fern; and among orchids the following four species:—*Vanda cœrulescens* from the East Indies, *V. cristata* from Nepal, *Stelis pubescens* from Brazil with yellowish green very small flowers, and *Platyclines latifolia* from East Indies. A mango (*Mangifera indica*) had several lots of flower spikes, and the Vanilla (*Vanilla planifolia*) was seen in fruit.

LOCH CHON AND BEN VENUE, 18th May, 1915.—Mr. D. Macdonald, Conductor.—The seven members of the Society who joined in this excursion were favoured with ideal weather for hill-climbing, as, after a dull morning, the sun broke out, and the sky was practically unclouded throughout the day. The six-mile walk along the north shores of Loch Ard was particularly enjoyed, and some very fine specimens of Lime Trees and Silver Firs were

noted, as well as very beautiful examples of *Berberis darwinii*. Midway along the loch, the whole of the party were treated to a splendid view of a Jay (*Garrulus glandarius*) in his very gayest plumage, and the bird, contrary to his usual furtive habits, was reluctant to depart from the view of the excursionists. In his own language he seemed to say:—"Do you not think that I and some of my kind should be left in Scotland to perpetuate the race? See to it that this heritage of bird-life shall be left unimpaired for the delight of future generations. Are we also, in this land of the Macgregors, to be extirpated root and branch? Are my decendants not to be allowed to show their finest attire to your decendants, as I do to you to-day? At present every ardent game preserver, every supine and indifferent landlord, would have me, at the beck of his servants, as extinct as the Great Auk—gone for ever from the landscape." The most hard-hearted egg-collector of the party admitted that the expostulation was needed, and that there ought to be a place in the scheme of things for this beautiful bird.

Loch Ard is distant from Aberfoyle a little over a mile. It is a fair trouting loch, although there are far too many of the wolfish pike in it. There are really two lochs, upper and lower, connected by An Amhrunn Dhu (the black river), having its fountain head between Lochs Chon and Arklet. After leaving the former loch it passes through Loch Dhu, thence to Loch Ard, and meets the Duchray, the southern and main branch of the Forth, a short distance from where it leaves the loch.

Near the head of the loch are the falls of Ledard formed by the Coire Ghlas, a stream having its origin on the slopes of Ben Venue. On the opposite side of the loch, the pipes of the Glasgow Water Company pass, skirting the southern shores of Lochs Chon and Ard. The latter is one of our most beautiful Highland lochs, particularly at its southern end, and is surrounded with rocky promontories, so that the shores are well nigh impassable to pedestrians. Near the head of the loch is An t'eilean Gorm (the green island), and on another islet not far from this are ruins known as "Duke Murdoch's Castle."

About two miles above Kinlochard, the party split up, one division proceeding to explore the district lying between Loch Chon and the foot of Ben Lomond, while the other essayed the climbing of Ben Venue.

It must be admitted that to the botanists of the party, Ben Venue was disappointing, as there was an almost total absence of moist rock surfaces, but the panoramic view from the top was grand in the extreme.

The Ben Venue party returned to Kinlochard via the Ledard Gorge, where they were afterwards joined by the Duchray division. After an alfresco tea here, the party drove to Aberfoyle, where, in the short interval of waiting for the train two Garden Warblers poured forth gladsome music from a few trees near the station.

The following is a list of summer-migrants seen, noteworthy being the Grasshopper Warbler. Migrants not seen, but known to occur, are the Sedge Warbler, Corncrake, and Nightjar.

List of summer-migrants:—Wheatear (*Saxicola oenanthe*), Ring-ouzel (*Turdus torquatus*), Whinchat (*Fringilla rubetra*), Redstart (*Ruticilla phœnicurus*), Whitethroat (*Sylvia cinerea*), Garden-Warbler (*S. hortensis*), Willow-Warbler (*Phylloscopus trochilus*), Wood-Warbler (*P. sibilatrix*), Tree-Pipit (*Anthus trivialis*), Spotted Flycatcher (*Muscicapa grisola*), Swallow (*Hirundo rustica*), House-Martin (*Chelidon urbica*), Sand-Martin (*Cotile riparia*), Swift (*Cypselus apus*), Cuckoo (*Cuculus canorus*), Common Sandpiper (*Totanus hypoleucus*), Grasshopper-Warbler (*Locustella nœvia*), amounting to seventeen, while during the day fifty-nine species were noted, including the Common Buzzard (*Buteo vulgaris*), and Raven (*Corvus corax*).

MILTON LOCKHART and MAULDSLIE CASTLE, 12th June, 1915.—Conductor, Mr. John Renwick.—The party, numbering 19 members and friends, went by rail to Carlisle. From the Railway Station to Milton Lockhart, a distance in a straight line of $1\frac{3}{4}$ miles, the valley of the Clyde descends about 450 feet, a gradient of 1 in 20 or 21. But as the actual walking distance is about $2\frac{1}{2}$ miles, we descend at an average of 1 in 29.

The Society has visited Milton Lockhart on two occasions, viz.:—19th August, 1893 (*Transactions*, Vol. IV. (N.S.) p. 118), and 14th June, 1902 (*Transactions*, Vol. VI. (N.S.) p. 347).

The gardener, Mr. Charles Cranston, who has been at Milton Lockhart for forty-seven years, met us on the way.

and accompanied us till he handed us over to the gardener at Mauldslic. He first led us to the top of Mount Pisgah, from which a beautiful view is obtained across the smiling fields and woods of the valley. The knoll is crowned by a fine Oak tree with a bole of 25 feet, girthing 11 feet at 4 feet 10 inches, an increase of 10 inches in 13 years. To the west of the house are some good Lime trees, measuring respectively 12 feet 11 inches at 3 feet 5 inches, bole 12 feet—increase, $8\frac{1}{2}$ inches in 13 years; 9 feet $5\frac{1}{2}$ inches at 4 feet 8 inches, bole 12 feet—increase $2\frac{1}{2}$ inches in 13 years; 11 feet $2\frac{1}{2}$ inches at 5 feet, bole 20 feet—increase, 1 inch in 4 years.

On the Millhill overlooking the river is a very fine English Elm (*Ulmus campestris*), the largest Mr. Renwick knows of in the Clyde area. It has a bole of 20 feet, girths 15 feet $3\frac{1}{2}$ inches at 5 feet 4 inches, and had a height of 90 feet in 1911. It looks as if it had at some time lost a good piece of the upper part of the trunk. An English Elm near the house, with a bole of 35 feet, girths 10 feet $4\frac{1}{2}$ inches at 5 feet, an increase of $6\frac{3}{4}$ inches in 13 years.

The building of the house at Milton Lockhart commenced in 1829, on a site selected by Sir Walter Scott, in company with the proprietor, William Lockhart, and his younger brother John, the son-in-law, and later the biographer of Sir Walter.

The visit occurred in the middle of January, 1829. Scott wrote in his Diary for 20th January:—"We strolled about Milton on as fine a day as could consist with snow on the ground, in company with John Greenshields, the new sculptor, a sensible, strong-minded man. The situation is eminently beautiful, a fine promontory round which the Clyde makes a magnificent bend. We fixed on a situation for William's new house where the sitting-rooms will command the upper valley, and with an ornamental garden I think it may be made the prettiest place in Scotland. Next day on our way to Edinburgh we stopped at Allanton to see a tree transplanted, which was performed with great ease. During the excursion I walked very ill, with more pain in fact than I ever remembered, and even leaning on John Lockhart, could hardly get on."

Scott re-visited Milton Lockhart in July, 1831, and "was pleased with the progress made in the new house, and especially commended my brother for having given his bridge 'ribs like Bothwell.'" Sir Walter died 21st September, 1832. The bridge is said to have been modelled after the style of old "Bothwell brig." It was built later than the house, all the stones for which, the gardener informed us, were carted across a ford from a quarry on the other side of the river. He pointed out the house in which Greenshields, the sculptor, was born. The locality is thus described in *The New Statistical Account*, Lanarkshire, p. 582:—"At Wallans, a small portion of Milton Lockhart estate on the south side of the Clyde, but in Carluke parish, and at one time evidently an islet, part of an old wall still stands, said to be the ruin of a fortalice where, on some perilous occasion, Sir William Wallace found a refuge. It is sometimes called Castle Wallans and Temple-hall."

Mr. Renwick thinks that the Clyde has changed its course, and that its old channel is shown by the parish boundary.

The ornamental garden foreshadowed by Scott occupies a sheltered position on a little terrace at the foot of a steep slope below the house. Overlooking it one's eye is carried along a fine reach of the river, bordered on each side by hanging woods, while the middle distance is closed by the once sacred hill of Tinto.

Regarding the garden Mr. John Cairns kindly supplies the following notes:—"The shrubs and herbaceous plants made an exceedingly pleasant display. *Cratægus Pyracantha* (the Evergreen Thorn) was in flower. This species was introduced from Southern Europe in 1629, and it is a wonder we do not see it more frequently in gardens, as even in the Glasgow district it proves to be quite hardy. It does not usually fruit so well, however, in this quarter as it does further south, or in more favourable localities. *Pæonia Moutan* was represented by several large flowering varieties. Among other plants were *Garrya elliptica*, the catkins of which are exceedingly ornamental in winter, and *Olearia Gunniana*, one of the Daisy Trees from Tasmania, the latter

in flower. This species does not usually prove quite hardy in the neighbourhood of Glasgow, and even at Milton Lockhart the gardener explained that in a severe winter it suffered considerably. *Buddleia globosa*, a native of Chili, was just coming into flower. *Buddleia variabilis magnifica* was growing against the garden wall. This is a Chinese species which is very conspicuous in late summer, when the plants are covered with the large spikes of rosy purple flowers. Amongst herbaceous plants, *Saxifraga pyramidalis*, the double-flowered form of *Barbarea vulgaris*, and the old-fashioned Double Purple and White Rocket, made a very nice display."

Lower down the river a very large double-flowered pink Hawthorn made a grand show. Mr. Cranston stated that it was planted or grafted about 72 years ago.

Near it is a drooping Elm (*Ulmus montana*), with a bole of 8 feet and a girth of 3 feet 10 inches at 4 feet.

We next proceeded to the house, where, after some conversation with Mrs. Lockhart, we were generously entertained to tea.

From Milton Lockhart House we proceeded down the side of the river to the neighbouring estate of Mauldslee, belonging to Lord Newlands, a member of the Society. The dividing line between the estates is formed by Jock's Burn. Near it we saw the alkanet, *Anchusa sempervirens*. The gardener, Mr. David Bryson, now took charge of us, and led us through the gardens and on to the castle.

Lord Newlands sent word that he would like to meet us, and accordingly we had the honour of an introduction to him and Lady Newlands, and walked with them round the terraces.

Between the house and the Clyde are a number of fine trees, the most conspicuous being the large Grey Poplar described and figured in *The Glasgow Naturalist* (1911), Vol. III., p. 119. It is the biggest tree of this species known in the United Kingdom. In May last year it had increased $5\frac{1}{2}$ inches in girth to 21 feet $8\frac{1}{2}$ inches. Near the front of the house is a notable Horse Chestnut. Three of the large branches which go off at a height of 8 to 10 feet up have come down to the ground and

taken root. They are much larger in girth after thus layering. The girth of the trunk at 2 feet 6 inches is 11 feet 8 inches, an increase of $17\frac{1}{2}$ inches in 22 years. A Horse Chestnut at Loudon Castle shows the same phenomenon, and the immense Beech at Newbattle Abbey is even more remarkable in the same way.

Mr. Cranston states that when a large addition was built to Mauldslie Castle by the late Lord Newlands, about 25 to 30 years ago, much of the material excavated for the foundations was deposited around the Horse Chestnut tree, which then stood in a little hollow. The surface was raised about 8 feet, bringing the ground up to the level of the lower branches, which thereafter struck root.

Notes.

The Thrasher or Fox-shark (*Alopias vulpes* (Gmel.)) and the **Basking Shark** (*Selache maxima* (Gunner)) **off the Ayrshire Coast.** On 25th October, 1915, we were fishing herring with a trawl net about three miles north-west from Lady Isle (off Troon). In hauling up the net it was found that a Thrasher had got tied up in it. After considerable difficulty, we managed to get a rope fixed above the tail and set the fish up with our block and tackle for setting the sail. It caused some commotion when we had its tail clear of the water far enough to try to cut it off, and as we had it set up the mast it was making the boat rock like a cork. I was cutting the tail off when I could get a chance, but it was whistling like an evil thing. The tail lay in our boat for a day. We had no rule to measure it exactly, but a fisherman can measure a fathom to a fraction of an inch, and we made the tail to be $7\frac{1}{2}$ feet. The fish would measure in all from 16 to 18 feet, and looked to have a circumference at the greatest girth of an apple barrel.

Looked at by the light of our torch it was very pretty, being of a silvery white colour on the belly with a brilliant greenish sheen. The back part was grey, and, contrary to my experience of large fish in the sea, was smooth to the touch. It may

be of interest to state that this is the third time I have seen the Thrasher Shark. Once about four miles west from Ayr, and once we had one in our net at Portincross Point, about a quarter of a mile from the shore, a day or two after the shooting tragedy there. In this case we saw the fish distant from the boat side about 6 feet, but it tore the net and got off.

During the autumn months there were a number of Basking Sharks or Sail Fish about. Crossing over to Arran one day we saw four sailing lazily along the surface. We start our motor full power and strike these fish. They are clumsy beasts. They seem to have a length of from 25 to almost 40 feet.—JOHN M'CRINDLE, Dunure.

[In Mr. Thos. Scott's account of the "Fishes of the Clyde" in the *Eighteenth Annual Report of the Fishery Board for Scotland*, 1900, the Thrasher appears in square brackets, the only reported occurrence in Clyde known to him being one that he had heard of from Captain Campbell, of the Fishery steamer "Garland." Captain Campbell had seen one between Crarae and Castle Lachlan "a year or two ago." It was making an attack on what was probably a cetacean. It was employing tactics familiar to Captain Campbell from his experience of this species when voyaging across the Atlantic. One was brought ashore in Machrihanish Bay, July, 1895, according to Mr. Gray, late Curator at the Millport Marine Station, who informed Mr. Scott of the occurrence. This Thrasher was 15½ feet in length. Machrihanish is, of course, not in the Clyde Area. The paucity of the known facts regarding this species in Clyde adds great interest to Mr. M'Crindle's narrative given above.

In a short paper on a Basking Shark stranded on the Little Cumbrae, in this Journal (Vol. V, pp. 66-67), Mr. Elmhirst drew attention to the fact that if we judged by existing records the species does not often visit the Clyde Area, but he expressed the opinion that the numerous records of "sail-fish" received from yachtsmen and others probably referred to this species. It is remarkable that in the list of fishes of Clyde in the Fishery Board Report quoted above, Mr. Scott only mentions

a young one caught near Turnberry, Ayrshire, in 1898, and gives a quotation from Dr. Landsborough's *Natural History of Arran* to show that a century before the publication of that work, presumably a century and a-half ago now (the writer has only seen the second edition, and it is dated 1875), the Basking Shark was a frequent visitor to the Clyde. From Mr. M'Crindle's note on the subject above, however, it appears that numbers were seen in the autumn of 1915; the writer's son (Mr. James Paterson) saw one on a day in the summer of 1914, when crossing in a small boat from the "Wee Cunbrae" to Portincross; and in the autumn of 1913 they were frequently seen in Loch Fyne, according to Mr. Alex. Ross, our Hon. Secretary, who himself saw several.—ED.]

Little Stint (*Tringa minuta*) at Hogganfield Loch. Being in Glasgow during the week-end of our October holiday, I took the opportunity of visiting Hogganfield Loch on Sunday forenoon, October 3rd. Towards the top end of the loch my attention was taken up by two small waders, which proved on my near approach to be a Dunlin (*Tringa alpina*) and a Little Stint (*T. minuta*).—NICOL HOPKINS, Darvel, 20th October, 1915.

The Scale Fern (*Ceterach officinarum*) in Argyll. In the end of August, 1915, when walking in Cowal, Argyllshire (I do not think it fair that the exact locality should be made public), I found on a wall at one place only, but extending to about thirty paces, fifty to sixty plants of the Scale Fern. The plants were all healthy, although they had not very large fronds, 2 to 3 inches long most of them.—WILLIAM RENNIE, 6th September, 1915.

[Hooker, in the "Students' Flora," 1884, mentions "Argyll" for this species, but no locality is given. In this connexion it may be noted that Mr. Alex. Ross, when at Cairndow on Loch Fyne in 1894, on visiting the gardens at Ardkinglas, found this species growing freely on garden-walls there. He was informed by the gardener that he had first observed it fifteen years before the time of Mr. Ross's visit.—ED.]

ABSTRACT STATEMENT OF ACCOUNTS—SESSION 1913-1914.

1913.—Sept. 1.			
To Life Members' Fund, - - -	£175 10 0		
„ Ordinary Fund, - - -	52 7 10		
	<u>£230 17 10</u>		
21 Life Members on Roll, @ £5 5s. = £110 5s., Surplus, £68 5s., transferred to Ordinary Fund.			
To Balance—Life Members' Fund, £110 5 0			
„ „ Ordinary Fund, - - -	120 12 10		
	<u>£230 17 10</u>		
1914.—Aug. 13.			
To 1 Life Member's Subscription, - - -	5 5 0		
„ 151 Ordinary Members' Subscriptions, @ 7s. 6d., - - -	56 12 6		
„ 6 Members' Arrears, - - -	3 15 0		
„ 3 Associates, Subscriptions, @ 5s., - - -	0 15 0		
„ Interest, - - -	5 13 6		
„ Donations—Lantern, - - -	10 5 6		
„ do. Printing, - - -	2 10 0		
„ do. Illustrations, - - -	0 14 0		
„ <i>Glasgow Naturalist</i> and Reprints, - - -	0 13 7		
	<u>£317 1 11</u>		
1914.—Aug. 31.			
By Rent and Attendance, - - -		£7 10 0	
„ Postage, Stationery, &c., - - -		8 0 0	
„ Printing Circulars, &c., - - -		9 14 1	
„ <i>Glasgow Naturalist</i> , Vol. IV., - - -		44 17 9	
do. Vol. V., - - -		53 0 5	
„ Carriage on <i>Glasgow Naturalist</i> , - - -		3 8 8	
„ Lantern, - - -		10 16 0	
„ Lantern Expenses, - - -		0 6 6	
„ Library—Magazines, - - -	£4 15 6		
Insurance, - - -	0 12 0		
Binding, - - -	2 1 8		
Postage, Stationery, &c., - - -	0 9 10		
		<u>7 19 0</u>	
„ Marine Biological Association, - - -		1 1 0	
„ Balance—Life Members' Fund in Bank, - - -	£115 10 0		
„ Balance, Ordinary Fund, in Bank and on hand, - - -	54 18 6		
		<u>170 8 6</u>	
		<u>£317 1 11</u>	

GLASGOW, 19th October, 1914.—We have examined the Accounts, and compared them with relative Vouchers and Securities, and found them correct. Cash in Treasurer's hands, Seven pounds seven shillings and a penny.

(Signed) JOSEPH SOMMERVILLE.
JAMES JACK.

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THE GLASGOW NATURALIST.

1870

The Glasgow

∴ Naturalist

THE JOURNAL OF THE
NATURAL HISTORY SOCIETY OF GLASGOW

(Including the *Transactions and Proceedings* of
the Society, Third Series)



Volume VIII.

1926

GLASGOW: JOHN SMITH & SON (GLASGOW), LIMITED
61 ST. VINCENT STREET

PRINTED BY
ROBERT ANDERSON, 142 WEST NILE STREET,
GLASGOW.

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The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII., No. 1.]

[May, 1916.

Notes on the Microfungi of the Kyles of Bute District.

By D. A. BOYD.

[Read 26th October, 1915.]

THE district bordering on the Kyles of Bute, and embraced within the parishes of Dunoon, Inverchaolain, Kilmodan, and Kilfinan, presents various physical features of considerable interest. The richness and variety of its scenery are too well known to need more than a passing comment; while the remarkable mildness of its climate, due to a somewhat land-locked situation, and the fertility of its soil, are attested not only by the luxuriant development of wild vegetation, but by the healthy growth of many garden shrubs, &c., which seldom flourish in the open air so far north as Argyllshire. At Tighnabruaich, for example, the beautiful *Desfontainea spinosa* Ruiz & Pav., a native of Peru and Chili, with holly-like foliage and rich abundance of yellow-scarlet tubular flowers, is successfully grown as a lawn-shrub, and attains an altitude of more than double the height usually indicated as its normal stature. On the Argyllshire shores of the Kyles, the beach consists mainly of schistose rocks and shingle, often overgrown with green vegetation almost to the edge of the sea.

It is to be regretted that so attractive a district should lie beyond the range of localities conveniently accessible at the excursions of our own and kindred societies, and should apparently seldom receive attention from botanist visitors. But although available information as to the flora, especially as regards the lower cryptogamic orders, is disappointingly meagre, yet the few facts placed upon record afford striking evidence of the richness of these shores in microfungi and allied forms of plant life. It is, therefore, hoped that the collection and publication of the facts referred to may have the effect of directing further attention to the district as an unusually promising field for investigation.

With regard to the particular localities from which information has been derived, it may be stated that, at an excursion of our Society on 25th September, 1908, some attention was devoted to the botany of the shore between Tighnabruaich and Ardlamont, as well as to plants occurring on the roadsides between Kames, Millhouse, Kilbride Church, and Ardlamont. The distance of about nine miles covered in this walk was too great, and the time available too limited, to admit of a careful and leisurely search being made for microfungi, but several very interesting species were nevertheless obtained. Among these may be mentioned *Septoglæum salicinum* Sacc., previously unrecorded for Britain, as well as *Geoglossum difforme* Fr., *Cryptospora betulina* Tul., and *Coniothyrium Boydeanum* A. L. Sm.

On 18th July, and again on 24th September, 1913, the writer visited Tighnabruaich, when he was able to add materially to the list for that locality. Among the most notable species then recorded were *Orbilbia marina* (Phil.) Boyd, *Dasyscypha crucifera* (Phil.) Sacc., *Phyllosticta ulmi* West., *Septoria myricæ* Trail, and *Ramularia violæ* Trail.

Toward, at the foot of Loch Striven, was visited by the writer on 14th July, 1913, when several interesting species were obtained, including *Synchytrium taraxaci* De Bary & Wor., *Orbilbia marina* (Phil.) Boyd, *Ramularia plantaginea* Sacc. & Berl., *R. taraxaci* Karst., and *R. heraclei* Sacc.

By far the most productive locality, however, was the neighbourhood of Colintraive, visited at an excursion of the Society on 23rd August, 1913, when over seventy species were obtained, one of which has proved new to science and four new to Britain.* On that occasion our attention was directed mainly to the roadside and moist woods extending eastward from Colintraive Hotel towards South Hall, and to the shores of the Kyles at various points on the way; but the time available did not admit of more than a very hurried survey being made.

These localities, however, represent only a small portion of the district, from the greater part of which no information has as yet been supplied. Among the places specially worthy of future attention, reference may be made to the richly-wooded shores of Loch Riddon, as presenting, in a very marked degree, the favourable conditions of moisture, shelter, and luxuriant plant-life. An exploration of Glendaruel, the valley which stretches northward from the head of Loch Riddon, would doubtless be productive of interesting results; while the shores on both sides of Loch Striven, and around the head of the loch, offer in many respects a delightfully attractive field for botanical research.

The results of the various excursions and visits referred to are embodied in the following list of species, to which are also added numerous records of microfungi obtained on the Bute-shire shores of the Kyles, between Kames Castle and Shalunt (parish of North Bute), in the course of a visit by the writer to that locality on 8th August, 1913.

For the sake of brevity, the various localities from which records are reported are denoted as follows:—1 = Tighnabruaich, &c.; 2 = Colintraive; 3 = Toward; 4 = North Bute.

List of Species.

Phytophthora infestans (Mont.) De Bary. On *Solanum tuberosum*. 1.

* See *Glasgow Naturalist*, vii., 78, 79.

- Plasmopara nivea (Ung.) Schröt. On *Ægopodium Podagraria*. 1.
- P. densa (Pers.) Schröt. On *Bartsia Odontites*. 3.
- Peronospora arenariæ (Berk.) Tul. On *Arenaria peploides*. 4.
- P. alta Fckl. On *Plantago major*. 2, 3.
- Synchytrium taraxaci De Bary & Wor. On *Taraxacum officinale*. 3.
- S. succisæ De Bary & Wor. On *Scabiosa succisa*. 2.
- Protomyces macrosporus Unger. On *Ægopodium Podagraria*. 1, 2, 3, 4.
- P. pachydermus Thüm. On *Taraxacum officinale*. 1.
- Ustilago avenæ Jensen. On *Avena sativa*. 2, 4.
- Tilletia decipiens (Pers.) Körn. On *Agrostis vulgaris*. 4.
- Uromyces armeriæ Lév. As Uredo on *Armeria maritima*. 4.
- U. flectens Lagerh. On *Trifolium repens*. 3.
- U. geranii Otth. & Wart. On *Geranium pratense*. 3, 4.
- U. rumicis Schröt. On *Rumex Acetosa*. 1, 2, 4.
- Puccinia glomerata Grev. On *Senecio Jacobæa*. 1.
- P. centaureæ DC. On *Centaurea nigra*. 3, 4.
- P. cirsii Lasch. On *Cnicus palustris*. 2, 4.
- P. obtogens Tul. On *Cnicus arvensis*. 1, 3.
- P. menthæ Pers. On *Mentha*. 1, 4.
- P. annularis Schlecht. On *Teucrium Scorodonia*. 1.
- P. primulæ Duby. On *Primula vulgaris*. 1, 2.
- P. epilobii DC. On *Epilobium palustre*. 1.
- P. violæ DC. On *Viola Riviniana*. 1, 2.
- P. umbilici Guep. On *Cotyledon Umbilicus*. 1. (Dr. B. White. *Mycologia Scotica*, p. 413).
- P. calthæ Link. On *Caltha palustris*. 1.
- P. arenariæ Schum. On *Arenaria trinervia*. 1.
- P. polygoni-amphibii Pers. On *Polygonum amphibium* var. *terrestre*. 1.
- P. oblongata Wint. As Uredo on *Luzula maxima*. 1, 2.

- P. holcina* Eriks. As *Uredo* on *Holcus mollis*. 1, 4.
- P. poarum* Niels. As *Æcidium* on *Tussilago Farfara*. 1, 4.
- Phragmidium fragariastrum* Schröt. On *Potentilla Fragariastrum*. 1, 2.
- Ph. violaceum* Wint. On *Rubus fruticosus*. 1, 2, 4.
- Coleosporium tussilaginis* Tul. On *Tussilago Farfara*. 1.
- C. sonchi* Lév. As *Uredo* on *Sonchus arvensis*. 2.
- C. euphrasiæ* Wint. On *Bartsia Odontites*. 2. On *Euphrasia officinalis*. 3. On *Rhinanthus Crista-galli*. 4.
- Melampsora larici-caprearum* Kleb. As *Uredo* on *Salices*. 1, 4.
- Pucciniastrum circææ* Speg. As *Uredo* on *Circea Lutetiana*. 1, 2.
- Melampsoridium betulinum* Kleb. On *Betula alba*. 1, 2.
- Thecopsora vacciniorum* Karst. As *Uredo* on *Vaccinium Myrtillus*. 1, 2.
- Milesina blechni* Syd. As *Uredo* on *Blechnum Spicant*. 1, 2.
- Exoascus alnitorquus* (Tul.) Sadeb. On *Alnus rotundifolia*. 2.
- E. potentillæ* (Farl.) Sacc. On *Potentilla erecta*. 1, 2, 4.
- Geoglossum difforme* Fr. Amongst short grass on the sea-shore, 1.
- Orbilina marina* (Phil.) Boyd. On stranded *Fucus vesiculosus*. 1, 3, 4.
- Dasyscypha crucifera* (Phil.) Sacc. On dead bark of *Myrica Gale*. 2.
- Trochila craterium* (DC.) Fr. On dead ivy-leaves. 1.
- Pseudopeziza trifolii* (Bernh.) Fckl. On *Trifolium repens*. 1, 2, 3, 4.
- Coccomyces dentatus* (Kze. & Schm.) Sacc. On fallen Oak-leaves. 2.
- Rhytisma acerinum* (Pers.) Fr. On fallen Sycamore-leaves. 2.
- Podosphæra oxyacanthæ* (DC.) De Bary. On *Cratægus Oxyacantha*. 4.
- Uncinula aceris* (DC.) Sacc. On *Acer Pseudo-platanus*. 1.
- Microsphæra berberidis* (DC.) Lév. On *Berberis vulgaris*. 1.

- Epichloe typhina (Pers.) Tul. On living grass-stems. 1.
 Phyllachora junci (Fr.) Fckl. On *Juncus communis*. 2, 4.
 Ph. podagrariæ (Roth) Karst. On *Ægopodium Podagraria*.
 2, 4.
 Plowrightia ribesia (Pers.) Sacc. On dead twigs of *Ribes
 rubrum*. 1.
 Stigmatea Robertiani Fr. On *Geranium Robertianum*. 2.
 Diatrype disciformis (Hoffm.) Fr. On dead Beech-bark. 2.
 Anthostoma turgidum (Fr.) Ntke. On dead Beech-bark. 2.
 Valsa ambiens (Pers.) Fr. On dead Beech-bark. 2.
 Cryptospora betulina Tul. On dead Birch-bark. 1.
 Melanconis stilbostoma (Fr.) Tul. On dead Birch-bark. 1.
 Pseudovalsa lanciformis (Fr.) Ces. & De Not. On dead Birch-
 bark. 1.
 Diaporthe Wibbei Ntke. On dead bark of *Myrica Gale*. 1.
 Leptosphæria agnita (Desm.) Ces. & De Not. On dead stems of
Eupatorium cannabinum. 2.
 Sphærella rumicis (Desm.) Cke. On *Rumex obtusifolius*. 3, 4.
 S. iridis Awd. On *Iris Pseudacorus*. 2.
 Phyllosticta sambuci (Desm.) On living Elder-leaves. 1, 2.
 Ph. ulmi West. On living Elm-leaves. 1.
 Ph. teucrii Sacc. & Speg. On *Teucrium Scorodonia*. 2.
 Ph. ajugæ Sacc. & Roum. On *Ajuga reptans*. 2.
 Coniothyrium Boydeanum A. L. Sm. On dead twigs of
Fuchsia. 1.
 Ascochyta urticæ A. L. Sm. & Ramsb. On *Urtica dioica*. 2.
 Darluca filum (Biv.) Cast. On *Trichobasis oblongata*. 2.
 Diplodina sonchi Henn. On *Sonchus arvensis*. 2.
 Septoria myricæ Trail. On fading leaves of *Myrica Gale*. 2.
 S. stellariæ Rob. & Desm. On *Stellaria media*. 1.
 S. tormentillæ Desm. & Rob. On *Potentilla erecta*. 4.
 S. quevillensis Sacc. On *Spiræa Ulmaria*. 2.
 S. hydrocotyles Desm. On *Hydrocotyle vulgaris*. 1, 2.
 S. podagrariæ Losch. On *Ægopodium Podagraria*. 1, 2, 3, 4.

- S. senecionis-sylvatici* Syd. On *Senecio Jacobæa*. 2.
S. scutellariæ Thüm. On *Scutellaria galericulata*. 2.
S. stachydis Rob. & Desm. On *Stachys sylvatica*. 1, 2, 4.
Phleospora aceris (Lib.) Sacc. On living Sycamore-leaves. 2.
Ph. ulmi Fr. On living leaves of *Ulmus montana*. 1.
Leptothyrium alneum (Lév.) Sacc. On living Alder-leaves. 2.
Melasmia acerina (Lév.) On living Sycamore-leaves. 1, 2, 4.
Glœosporium tiliæ Oud. On fading Lime-leaves. 2.
G. ribis Lib. On leaves of Red Currant. 1.
G. paradoxum (De Not.) Fckl. On dying Ivy-leaves. 1.
G. betulæ Lib. On fading Birch-leaves. 1.
Libertella faginea Desm. On dead Beech-bark. 2.
Melanconium bicolor Nees. On dead Birch-bark. 1, 2.
M. sphæroideum Link. On dead Alder-bark. 2.
Marssonia Delastrei (De Lacr.) Sacc. On *Lychnis dioica*. 2.
M. potentillæ (Desm.) Sacc. On *Potentilla anserina*. 2.
M. juglandis (Lib.) Sacc. On fading leaves of *Castanea*. 4.
Septoglœum salicinum Sacc. On fading leaves of *Salix viminalis*. 1.
Oidium erysiphoides Fr. On various herbaceous plants. 1, 4.
O. alphitoides Griff. & Maulb. On living Oak-leaves. 2, 4.
Trichoderma lignorum Tode. On decaying wood. 1.
Ovularia rufibasis (B. & Br.) Mass. On living leaves of *Myrica Gale*. 1, 2.
O. sphæroidea Sacc. On *Lotus uliginosus*. 4.
O. veronicæ (Fckl.) Sacc. On *Veronica Chamædrys*. 2.
O. obliqua (Cooke) Oud. On *Rumex obtusifolius*. 1, 2, 3, 4.
Sepedonium chrysospermum (Bull.) Fr. On decaying *Boleti*. 1.
Didymaria didyma (Ung.) Schröt. On *Ranunculus repens*. 2.
Ramularia violæ Trail. On *Viola Riviniana*. 1.
R. arvensis Sacc. On *Potentilla anserina*. 2.
R. heraclei Sacc. On *Heracleum Sphondylium*. 3, 4,
R. valerianæ (Speg.) Sacc. On *Valeriana officinalis*. 2.

- R. centaureæ Lindr. On *Centaurea nigra*. 4.
 R. knautiæ (Massal.) Bub. On *Scabiosa succisa*. 2.
 R. lampsanæ (Desm.) Sacc. On *Lapsana communis*. 2.
 R. taraxaci Karst. On *Taraxacum officinale*. 2, 3.
 R. variabilis Fckl. On *Digitalis purpurea*. 1.
 R. calcea (Desm.) Sacc. On *Nepeta Glechoma*. 1.
 R. plantaginea Sacc. & Berl. On *Plantago lanceolata*. 3.
 R. pratensis Sacc. On *Rumex Acetosa*. 1, 2, 3, 4.
 Cercosporella virgaureæ Thüm. On *Solidago Virgaurea*. 2.
 Fusicladium dendriticum Fckl. On living Apple-leaves. 1.
 F. depressum B. & Br. On *Angelica sylvestris*. 1, 2, 4.
 Scolecotrichum sticticum (B. & Br.) Sacc. On *Glyceria fluitans*. 2.
 Polythrincium trifolii Kze. & Schm. On *Trifolium repens*. 3.
 Cercospora mercurialis Fckl. On *Mercurialis perennis*. 4.
 Tubercularia vulgaris Tode. On dead bark. 2.
 Sclerotium roseum Kneiff. In dead stems of *Juncus communis*.
 2, 4.

Notes on some Scottish Leeches.

BY JOHN RITCHIE, JR.

[Read 23rd September, 1915.]

The following notes were mostly arranged while investigating local leeches to ascertain if they were hosts to any larval stages of parasitic worms.

Mr. L. A. L. King has dealt with several local species before this Society; and I beg leave to add, with some account of their habits, these notes as additional to his paper.*

1. *PROTOCLEPSIS TESSELLATA* (O. F. Müller).—I obtained several of this species at Castlesemple Loch, Lochwinnoch, in May of this year. Several of them were filled with ova, the specimen now exhibited mounted

* *The Glasgow Naturalist*, Vol. vi., pp. 39-47.

as a micro-slide being one. I also show another; a young form obtained at the same place on Saturday last. Both show the eight eyes very plainly. The young form was very different in colour from the mature leech, being of a bluish-grey colour, slightly lighter on the ventral surface, and covered over the whole body with black stellate pigment cells, and measured about 7mm. in length.

2. *GLOSSOSIPHONIA COMPLANATA* (L.).—This is a very common species, being met with both in streams and ponds; both the greenish and brown-coloured examples are equally common. W. A. Harding (*Parasitology*, Vol. 3, No. 2, p. 160), states that the eggs of this leech are attached to some foreign body, while H. Whitehead states that the eggs are carried by the parent (*Essex Naturalist*, Vol. xvii, 1913, p. 79). I have not observed the ova of this leech, but have on several occasions captured it, with several young forms attached to the ventral surface, during the months of July and August.

3. *GLOSSOSIPHONIA HETEROCLITA* (L.).—I obtained specimens of this leech from Castlesemple Loch, Lochwinnoch, in May of this year. Hitherto it has not been recorded from Scotland. (See Harding and Whitehead above.) The main differences of this form from *G. complanata* are in the eyes and the genital openings, also it is a much smaller form.

In this species the first pair of eyes are very small and closely approximated, the next two pairs being larger and wider apart; while the male and female genital organs have a common orifice between rings 28-29.

4 and 5. *HELOBDELLA STAGNALIS* (L.).—One slide shows the mother, who had the young forms (which are shown on the next slide) attached to the ventral surface. This species is very common around Beith and district.

6. *HÆMOPIS SANGUISUGA* (L.).—This specimen was obtained in August last, under a large stone in a pond at Windyhouse Farm, Beith, and preserved in 5% formalin. The stone was lying on the marshy ground surrounding a pond in which these leeches are to be obtained

swimming about during the summer months; under the stone (roughly 20 inches in diameter) there were 16 (sixteen) leeches, each in a burrow of its own, and each doubled up, with the ventral surfaces together; at the end of several of the burrows there was a small excavation of the earth, in which the cocoon lay. In this condition they were very sluggish, as they did not respond to stimulation by the action of the light when the stone was removed; or to touch, as, when gently prodded with a pencil, they lay quite still for some time before making any movement, in some cases ten minutes elapsed before reaction to the stimulus appeared.

I dissected some of the specimens, and found their alimentary canal full of food.

I have not seen any observation made on the faculty which this leech possesses of casting its skin. This process I have seen on several occasions; the cuticle commences to peel off at the anterior sucker, turning itself inside out, and falls off from the posterior sucker, the cast skin exhibiting the ring markings of the body. In 1913 I kept one of these leeches in an aquarium from August to December, and during that time it cast its skin four times. The specimen of the leech now exhibited shows the cuticle almost all peeled off. In the same tube is seen one cocoon entire, and another halved, to show the smooth cellular interior.

There are several colour variations in this leech, and I also show a living form with dorsal, ventral, and lateral black pigmented striations.

Most workers among this class recognise that there is great difficulty in killing and fixing leeches in such a manner that their structures in preserved specimens may be retained.

The most satisfactory method I have found is as follows:— I place the leech in a small petri dish, and drop a piece of flat glass over it; then, with a needle, press down the glass to the greatest amount of pressure it will bear, watching, at the same time, to see that the eyes of the leech are shown; when this is noticed, I pour into the petri dish hot Picro-sulphuric acid (Kleinenberg), which flows in between the glass and the petri dish. This, in a short time, kills the leech. I then remove the

pressure and the flat glass, and allow the leech to remain in the fixative from ten to twelve hours, wash in water to remove the yellow stain, place in 50% to 75% alcohol, stain in borax carmine for from twelve hours to two days, decolourise in acid alcohol, then pass through the various grades of alcohol to cedar oil and mount in balsam.

By this method I usually obtain good mounts, showing up the necessary structures for identification.

Trees and Shrubs in a Renfrewshire Garden.

BY JOHN CAIRNS.

I.—AUTUMN.

On the afternoon of Saturday, 18th September, 1915, twelve members of the Society visited Barochan, parish of Houston and Killallan, Renfrewshire, the property of Sir Charles Bine Renshaw, Bart.

The party travelled by train to Bishopton, and on arrival at Barochan, which was entered by a lodge called "The Hawks,"* were met by Sir Charles, who conducted them over his extensive policies and gardens.

It is not possible, in one afternoon, to exhaust the attractions of this interesting place, as Sir Charles has gathered together a wonderful variety of trees and shrubs, and arranged them in a manner which is not only beautiful but varied in effect. The configuration of the ground, and the way in which it has

* This may have been the hawk mews. The name recalls the renown of the Flemings of Barochan as falconers. "Peter Fleming of Barochan and six of his sons fell on the fatal field of Flowden. Mr. Fleming left a seventh son, who succeeded him. This same Peter Fleming was a celebrated falconer. His tersel beat the falcon of James IV, upon which the King unhooded his favourite hawk, and put the hood on the tersel. The hood was richly ornamented with precious stones." *The (New) Statistical Account of Scotland*, 1836.

been possible to give the necessary shelter to the more tender plants, have contributed to make this possibly the finest collection of trees and shrubs in the near vicinity of the city of Glasgow.

No attempt is made to give a complete list; only those are mentioned which came more particularly under observation during the afternoon.

It was not the best time of the year to see many of the species in flower, but now that the members know what a rich field is open to them, there may be a desire to accept Sir Charles's invitation to return in June, when, in his opinion, his collection is at its best.

Growing by the side of the avenue as we approached the mansion house was *Tilia Michauxii*, Nutt., a species from N.E. America, and a very striking tree on account of its foliage, which is much larger than that of the common Lime.

Near the mansion-house attention was directed to some fine specimens of *Prunus pissardi*, Carr. (the purple-leaved variety of the Cherry Plum, *Prunus cerasifera*, Ehrhart), which Sir Charles said had borne an abundant crop of fruit last year (1914). This now popular variety we owe to Mr. Pissard, gardener to the Shah of Persia, who noted it there, and sent it to France in 1880. Of *P. cerasifera* itself a tree was seen which was loaded with fruit, presenting a fine appearance. A large clump of *Arundinaria nitida*, Mitford, planted twelve years ago, which has now attained considerable dimensions, shows that Bamboos are by no means so tender as was at one time imagined, and provided they get shelter from strong winds they can take care of themselves. This Central and W. China species was introduced by way of Petrograd in 1889, and, according to Bean,* withstood the terrible February of 1895 better than any other species of Bamboo grown in this country. *Clethra alnifolia*, L., the North American Sweet Pepper-bush, was in flower in several places in the grounds. This shrub attains a height of about five feet, and bears creamy white flowers, which are delicately fragrant.

* *Trees and Shrubs Hardy in the British Isles*

Several specimens of *Corylus colurna* L., the Constantinople Hazel, were noted. This is the largest and most ornamental of the genus, and was introduced into Britain from Turkey about 1665. The specimens at Barochan are in a healthy, vigorous condition, and it is to be hoped they will become full-grown trees.

Pyrus germanica, Hooker fil., the Medlar, and *Cydonia Japonica*, Thunb., the Japanese Quince, were observed in flower and fruit.

Staphylea colchica, Stev., one of the Bladder Nuts. This is a species from the Caucasus, and in Scotland usually attains a height of five feet. Its showy white flowers, in erect panicles, are produced in summer.

Halesia tetraptera, Michaux, the Snowdrop Tree, a North American shrub bearing in summer white flowers, which, both in size and appearance, resemble the snowdrop.

Catalpa bignonioides, Walt., the Indian Bean, of which there are several specimens, but they do not appear to be quite at home in their surroundings.

Romneya Coulteri, Harvey, the Californian Tree-Poppy, was observed in vigorous growth, and had just finished flowering. This is not a hardy plant in many districts, but where it succeeds it is an object of much beauty. Its tall shoots, with silvery-grey foliage, and its pure white flowers, often five to six inches across, always arrest attention.

Enkianthus japonicus, Hooker fil. This is a native of Japan, but not by any means common as yet in cultivation, and I have never seen it in flower.

Several *Camellias* in vigorous health were seen. Sir Charles says they flower abundantly every year.

Of a huge specimen of *Gunnera manicata* some of the leaves were fully six feet across.

Baccharis patagonica, Hooker, the Patagonian Groundsel Tree, a small-leaved evergreen shrub, producing yellowish-white flowers in summer.

Cornus Kousa, Bueg. A very distinct and beautiful species of Cornel, the flowers of which are yellow in colour, and although small individually, the pure white bracts are very conspicuous. The autumn coloration of the leaves is very fine.

Salix babylonica, Linn., var. *annularis*, the Ringlet Willow. The foliage of this curious variety is curled or twisted in cork-screw fashion.

Pyrus torminalis, Ehrhart., the Wild Service Tree. A native of Britain, it forms a medium-sized tree, but is almost unknown in Scotland in cultivation. Its leaves are broadly ovate in form, divided into three pointed lobes on either side.

Indigofera gerardiana, Wall. An attractive shrub of the leguminous order, with racemes of bright pink flowers. This is a plant one would expect to see more frequently, as it is quite hardy, and flowers well in the Glasgow Botanic Gardens.

Phillyrea latifolia, L., is an evergreen shrub with ovate leaves, serrated on the margins. It is more on account of its handsome foliage than by the flowers that one is attracted to it. The latter are small and dull-white in colour.

Buddleia variabilis, Hemsl., var. *magnifica*, was in fine flower; its panicles of deep rosy-purple flowers are very striking, and make it one of the finest autumn-flowering shrubs.

Caragana arborescens, Lamarck, var. *Lorbergii*, Kœhne. Bean describes this as "a remarkable variety, with very narrowly linear-pointed leaves. In flower it is inferior to the type, but its remarkable foliage makes it worth growing."

Liquidambar styraciflua, L., the Sweet Gum. The foliage of this tree resembles a maple. It becomes brilliant red in autumn, and is then a very conspicuous and attractive subject.

Hibiscus syriacus, L., the Syrian Mallow, formerly named *Althæa Frutex*, is an old favourite in many gardens, and was introduced to Britain in 1596. Its flowers are very showy in summer; those of the typical species are purplish in colour, but many varieties, in a wide range of colours, are now in cultivation.

Berberis trifoliolata. A dwarf species from New Mexico, with glaucous blue foliage, the individual leaves being about three inches long. The specimen noted does not appear to be in a very thriving condition.

Phlomis fruticosa, L., the Jerusalem Sage, a native of S. Europe and an evergreen shrubby plant, with ovate acute leaves, which are covered with a yellowish down. The yellow flowers are produced in the axils of the upper leaves.

Acanthopanax ricinifolium, Seem. An elegant shrub, native of China and Japan, which appears to find congenial quarters at Barochan; it is growing vigorously, and producing tall, erect stems. The plant at Barochan which is doing so well is the form with the deeply-divided leaves, known as *A. Maximowiczii*, Van Houtte.

Aralia chinensis, L., var. *elata*, Dippel, the Chinese Angelica Tree, usually known in gardens as *Dimorphanthus mandschuricus*, with its tuft of palm-like foliage on the top of its spiny stems, is also thriving well.

Ilex cornuta, Lindl. and Paxt., the Chinese Horned Holly, an interesting species, the leaves of which have three strong spines at the apex.

Olearias do well at Barochan; good examples of *O. macrodonta*, Baker; *O. Haastii*, Hook f.; and *O. stellulata*, DC., were seen. Amongst Coniferous Trees *Retinospora squarrosa* was most attractive, on account of its delicate foliage of almost silvery whiteness.

Polygonum baldschuanicum, Regel. This climbing species was in full flower near the garden, and was covered with panicles of its showy white blossom.

Cotoneaster frigida, Wall., was represented by numerous specimens bearing an abundant crop of scarlet fruits.

Trained against a low wall outside the garden were (1) *Lonicera fragrantissima*, Lindl. & Paxt., in vigorous condition, whose pure white fragrant flowers are produced in winter; and (2) *Anthyllis Barba-Jovis*, L., the Jupiter's Beard or Silver

Bush, a S.W. Europe and Mediterranean species, cultivated in England since the middle of the seventeenth century. A number of interesting plants are also to be found on the low walls around the mansion house, amongst these may be mentioned—

Choisya ternata, H.B.K., the Mexican Orange Flower. The dark shining green leaves of this plant are always exceedingly attractive, and when with these are combined the pure white sweetly-scented flowers, it is an object of great beauty.

Berberidopsis corallina, Hook. f., the Coral Plant, a native of Chili, and a handsome evergreen shrub. The clusters of waxy, coral-red flowers, in contrast with the deep-green foliage, were indeed lovely. The spiny, toothed leaves are not unlike those of some of the Barberries.

Ribes speciosum, Pursh, the Fuchsia-flowered Gooseberry, a Californian species with flowers not unlike a Fuchsia, blood-red in colour, and with long protruding stamens. Its flowering season was over, but I did not observe any fruit upon it.

Desfontainea spinosa, Ruiz and Pav. A native of Chili, Peru, &c. An evergreen shrub of bushy habit, with prickly, holly-like leaves, and scarlet and yellow trumpet-shaped pendant flowers. W. J. Bean, in his recent book on *Trees and Shrubs Hardy in the British Isles*, says: "it is not hardy near London, but appears to find its most congenial conditions in the West of Scotland."

Escallonia langleyensis, Hort. This is a hybrid between *E. Philippiana* and *E. punctata*, and is certainly one of the finest of the group. It produces long slender shoots, which are covered with bright rosy-crimson flowers in July.

Hydrangea petiolaris, Sieb. and Zucc. This clings to its support by aerial roots, like Ivy, and produces its white flowers in corymbs. A species of *Chionanthus* arrested attention on account of its foliage, but it was not identified; possibly *C. virginica*, the Fringe Tree.

Tricuspidaria lanceolata, Miq. A Chilian evergreen shrub,

which may not prove quite hardy enough to flower at Barochan. The flowers are brilliant red in colour, and somewhat Fuchsia-like in appearance.

On the wall at the stables there is a fine specimen of *Periploca græca*, L., the Poison Vine. This is a rapid-growing climber at Barochan, where it has proved to be quite hardy. Its flowers are purplish-brown, with green tips, and are produced in summer.

Azara microphylla, Hook, f., grows with great luxuriance in close proximity to the last-mentioned plant. It was planted fourteen years ago, and is now a splendid specimen. The small dark-green glossy leaves are highly ornamental; the flowers are yellow, and exceedingly fragrant; they are small in size, but are produced in wonderful profusion in late spring.

Many species of *Cotoneaster*, *Cratægus*, *Spiræa*, and *Erica*, together with numerous other trees and shrubs, are not noticed here, as they would be seen to much better advantage at an earlier period of the year.

Before leaving, the party was entertained to tea by Sir Charles, who, by his kind attention, made the visit a pleasant one for all concerned.

Excursions in Breadalbane (Killin District), July, 1915.

BY JOHN R. LEE.

[Read 28th September, 1915.]

Following the custom of recent years, a series of Alpine Excursions was arranged to take place during the Glasgow Fair Holidays, the district chosen for this year being the rich botanical ground in the vicinity of Loch Tay and Glen Lochay, with Killin as a centre. The arrangements were announced jointly with the Andersonian Naturalists' Society, and it was intended to visit a number of the mountains, especially near

the lower end of Glen Lochay. Unfortunately, however, the weather proved to be unfavourable, and only on three of the days was it found practicable to make an ascent of the hills. In all, eight members took part in the excursions.

On Fair Saturday, 17th July, a party of six started from Bridge of Lochay Hotel, about 9.30 a.m., and made the ascent of Craig-na-Cailliach. This hill rises steeply from the north-eastern extremity of the glen to a height of 2,990 feet above sea-level, its lower slopes being densely and picturesquely tree-clad up to nearly 1,200 feet, above which there is a stretch of moorland, with heather and peat-bog. From an altitude of about 1,800 feet to the summit there is a succession of rocky bluffs and precipices facing towards the east and north-east, the ledges of which are the home of many of the most interesting species of alpine plants, and have long been famous as a happy hunting-ground of the botanist. Some considerable time was spent exploring the corners and crevices, and many of the rarer plants were noted. After leaving the summit, a detour was made to visit the spot where the rare *Alsine verna* occurs, and the members of the party were delighted to find this interesting little plant in fine bloom, and apparently spreading. *Salix Lapponum* was also noted at the same spot. Throughout the day the party were favoured with dry weather, this being the only complete dry day during the whole time of these excursions.

Monday, 19th July, being very wet, nothing could be attempted in the way of exploring the hills or moors; but the heavy rain which had continued all through the previous night made the rivers a sight to be remembered, and visits to the Falls of Lochay and the rapids of the Dochart were greatly enjoyed. The bad weather continuing through Tuesday, 20th July, this day also was spent in short rambles to places in the vicinity, the wonderful avenue of limes near Finlarig being the principal objective. These magnificent trees are of the large-leaved species (*Tilia grandifolia*, Ehrh. = *T. platyphyllos*, Scop.) and form one of the principal "sights" of the district. Beyond the avenue, in the Finlarig woods, there are many trees of

various species, noteworthy for their great size. A Spanish chestnut, on the roadside, was measured, and girthed 17 feet 3 inches at 5 feet from the ground on the south side of the trunk, while a beech measured 13 feet 9 inches—also at 5 feet south.

Wednesday, 21st July, showed signs of a slight improvement in the weather, and accordingly four members motored to Lochan-na-Lairig, from which the rocks of Craig-an-Lochan were visited. This is well known to be one of the richest parts of the district, and on this occasion the party were rewarded by seeing most of the plants of special interest. After exploring the rock-faces of Craig-an-Lochan, and ascending to the top of the ridge, the members proceeded to the summit of Meall-nan-Tarmachan (alt. 3,421 ft.), afterwards making their way round the northern side of the peak to visit the broken rocks on that least accessible part of the hill. From thence they descended in a south-westerly direction to Bridge of Lochay.

On Thursday, 22nd July, five members walked to Ardeonaig by the road along the south side of Loch Tay, which leads through beautifully wooded country, and affords numerous delightful views of the lake and the majestic mountains on its northern sides. On the shore near Ardeonaig Pier a great abundance of the stone bramble (*Rubus saxatilis* L.) was found in ripe fruit. The return was made by steamer from Ardeonaig, and for a short distance the sail was a most enjoyable one. Before reaching Killin Pier, however, a very heavy downpour of rain commenced, and by the time members reached the destination the quality of their waterproof coats was severely tested.

Next day, Friday, 23rd July, six members travelled to Lawers Hotel, preparatory to an ascent of Ben Lawers on the following day. Reaching Lawers about mid-day, the afternoon was spent in short walks in the neighbourhood, and an ascent was made to the top of Meall Odhar (Meiller)—a small eminence forming part of the immense southern slope of the Ben. Here, at an altitude of 1,300 ft., some fine specimens of the rock-rose (*Helianthemum Chamæcistus*, Mill.) were observed.

On Saturday morning, 24th July, the party set out for the summit of Ben Lawers, in what looked like promising conditions, and, after skirting the shoulder of Meiller, made their way to the Western Ravine, in the hope of being in time to see the snow gentian, with its early-closing flowers still expanded in the sunshine. All promised well until the rocks at the lower part of the ravine were reached, when clouds obscured the sun, and the prospect of seeing the gentian flowers open became doubtful. The doubt deepened into hopeless certainty when, a little later, the rain began, and by the time the party reached the gentian rocks the flowers—which were seen in great abundance—had all definitely closed for the day. Frequent heavy showers were experienced during the remainder of the ascent, and until late afternoon the peak continued to be enveloped in dense mist. However, the rocks, both in the Western Ravine and in the Ordnance Gully, were fully explored, and the majority of the special plants of this part of the mountain were noted. It was observed that *Erigeron alpinum* was in specially fine condition, and the gentian particularly abundant; but *Myosotis alpestris* was not making such a good display as in former years. The members were delighted to observe that *Saxifraga cernua* was in some abundance, and appeared to have spread considerably among the boulders at the top of the Ordnance Gully.

It is scarcely to be expected that any new addition is likely to be made nowadays to the list of phanerogams and ferns of the Breadalbane mountains, the district having been so thoroughly searched by eminent botanical specialists; nevertheless, there is a never-flagging interest attaching to the search for the rarer species in out-of-the-way corners of this district, and on this occasion the members were fortunate in being able to observe practically all the more important of the rare plants recorded for the particular localities visited. In this connection it may be stated that the full honours of the occasion rest with Mr. Robt. M'Lean, M.A., to whose keen eye the party were indebted for the discovery of every one of the particular species most eagerly sought for.

A list is appended of all the plants specially noted, the

localities being indicated by a number referring to the districts visited, as follows:—1, Craig-na-Cailliach; 2, Finlarig and vicinity; 3, Craig-an-Lochan; 4, Meall-nan-Tarmachan; 5, moors and roadsides near Killin; 6, Ardeonaig; 7, Ben Lawers (including Meiller, &c.); 8, Glen Lochay; 9, Lawers (low ground). The list is not intended as in any sense a complete one, only those plants being included of which special note was made as being of some particular interest:—

Phanerogams.

Thalictrum alpinum, L., 1, 3, 4, 7.	Sedum roseum, Scop., 1, 3, 7.
„ majus, Crantz., 3, 6.	„ villosum, L., 7.
Corydalis claviculata, D.C., 8.	Pimpinella Saxifraga, L., 6.
Draba incana, L., 1, 3, 4, 7.	Erigeron alpinum, L., 7.
„ rupestris, Br., 7.	Gaphalium supinum, L., 1, 3, 4, 7.
Erophila inflata, Wats., 7.	Cnicus heterophyllus, Willd., 5.
Helianthemum Chamæcistus, Wats., 7.	Saussurea alpina, D.C., 3.
Silene acaulis, L., 1, 3, 4, 7.	Pyrola rotundifolia, L., 3.
Cerastium alpinum, L., 1, 3, 4, 7.	Gentiana nivalis, L., 7.
Alsine verna, Jacq., 1.	„ campestris, L., 9.
„ rubella, Wahl., 7.	Myosotis palustris, Hill, 5.
Cherleria sedoides, L., 7.	„ repens, Don., 1, 5.
Sagina Linnaei, Presl., 1, 7.	„ alpestris, Schmidt, 7.
Hypericum hirsutum, L., 2.	Veronica saxatilis, L., 3, 7.
Vicia sylvatica, L., 3, 9.	Calamintha Clinopodium, Benth., 6.
Rubus saxatilis, L., 6.	Polygonum viviparum, L., 1, 3, 7.
Rubus Chamæmorus, L., 1.	Salix Lapponum, L., 1, 7.
Dryas octopetala, L., 3.	„ arbuscula, L., 1.
Potentilla salisburgensis, Haenke, 1, 3, 7.	„ herbacea, L., 1, 3, 4, 7.
Saxifraga oppositifolia, L., 1, 3, 4, 7.	„ reticulata, L., 1, 3, 4, 7.
„ nivalis, L., 3, 7.	Malaxis paludosa, Sw., 5.
„ stellaris, L., 1, 3, 4, 7.	Habenaria viridis, Br., 7.
„ aizoides, L., 1, 3, 4, 5, 7, 8, 9.	„ chlorantha, Bab., 6, 7, 9.
„ rivularis, L., 7.	Juncus tenuis, Willd., 5.
„ cernua, L., 7.	Luzula spicata, D.C., 1, 3, 4, 7.
„ hypnoides, L., 1, 3, 7.	Avena alpina, Sm., 3.

Pteridophytes.

Pseudathyrium alpestre, Newm., 4.	Lycopodium Selago, L., 1, 3, 4, 7.
Woodsia hyperborea, Br., 3.	„ clavatum, L., 7.
Aspidium Lonchitis, Sw., 1, 3, 4, 7.	„ alpinum, L., 1, 3, 7.

Mosses.

Polytrichum sexangulare, Flörke., 7.	Mnium orthorrhynchum, B. & S., 7.
Dicranum schisti, Lindb., 7.	Pterogonium gracile, Sw., 2.
„ Starkei, W. & M., 4.	Antitrichia curtipendula, Brid., 1.
Encalypta ciliata, Hoffm., 1, 7.	Thuidium Philiberti, Limpr., 1.
„ rhabdocarpa, Schwg., 7.	Brachythecium plicatum, B. & S., 1.
„ streptocarpa, Hedw.	„ glareosum, B. & S., 2.
(fertile), 5.	„ Starkei, B. & S., 7.
Amblyodon dealbatus, Beauv., 1.	Eurhynchium cirrosum, Jus., 7.
Meesia trichoides, Sw., 1.	Hypnum Halleri, L. f., 1, 7.
Webera elongata, Schwg., 1.	„ hamulosum, B. & S., 1.
„ cruda, Schwg., 7.	„ Bambergeri, Schp., 7.
Bryum alpinum, Huds. (fertile), 8.	

Hepatics.

Metzgeria pubescens, Raddi, 1.	Eucalyx obovatus, Breidl., 7.
Gymnomitrium concinnatum, Corda,	Lophozia alpestris, Evans, 7.
1, 7.	

Ornithological Notes from Beith (Ayrshire).

BY JOHN CRAIG.

[Read 25th January, 1916.]

STONECHAT (*Pratincola rubicola*).—In 1915 I found a nest of this species with young ones. This was the second brood. It is eleven years since I saw a nest of this species before.

GARDEN WARBLER (*Sylvia hortensis*).—A nest of this species which I found in 1915 had five eggs, which resembled those of the common whitethroat (*S. cinerea*). They were smaller than any garden warbler's eggs I have seen. The nest was built among herbage. The young ones left the nest three weeks after the last egg was laid. When the garden warbler arrived at Woodside, Beith, where I found this nest, it sang pretty constantly till the young ones were hatched. During the time the young ones were in the nest it only sang occasionally. When the young ones left the nest it sang for some time, but the song was neither so loud nor so long.

GREAT GREY SHRIKE (*Lanius excubitor*).—Mr. Kennedy caught a female great grey shrike on 4th December, 1915. He saw another near the same place on 18th December, 1915.

SWALLOW (*Hirundo rustica*).—In a swallow's nest here in 1915, containing five eggs, only two of the young were hatched. The other three eggs were clear, and one of them was left in the nest. When the swallows began to repair the nest for the second clutch, they built some clay on the top of the nest, and began to cover the egg that was in the nest with feathers, but the egg was taken out. The female only laid two eggs to the second clutch. That was only four young ones out of the two clutches.

HOUSE-MARTIN (*Chelidon urbica*).—A part of a house-martin's nest under the eave of a house had fallen off. When the birds repaired the nest for the second clutch, instead of leaving a hole in the front of the nest or at one of the sides, they left an open space round the top.

GOLDFINCH (*Carduelis elegans*).—Mr. Kennedy, Beith, saw seven goldfinches, and caught one of them on 13th November, 1915. This species is scarce here.

CHAFFINCH (*Fringilla cœlebs*).—I found a chaffinch's nest, in which two broods were reared in 1915.

HOLBOELL'S REDPOLE (*Linota holboelli*).—One was trapped early in November, 1910, by Mr. Kennedy from a flock of about forty "mealies" that were frequenting the small fir-wood behind the school at Beith. This is an addition to the Beith list.

SKYLARK (*Alauda arvensis*).—During the 1915 season I found a skylark's nest, with three eggs, entirely surrounded by gorse or whins, and another, with three young ones, on an almost perpendicular hillside.

KINGFISHER (*Alcedo ispida*).—This species continues to occur as usual. I saw two quite recently.

NIGHTJAR (*Caprimulgus europæus*).—A clutch of two eggs, which is the usual number, was found on one of the Bigholm hills in June, 1913. The bird flew off the eggs, which were laid on the ground, as this species builds no nest. Many years ago the nightjar was reported to occur on the Bigholm hills, and a boy claimed that he had caught a young nightjar there, but I did not think it right to add this new species to the Beith list until its occurrence was beyond doubt.

RUFF (*Machetes pugnax*).—I saw this species at Kilbirnie Loch on 16th September, 1915. The most I saw in one day was six birds. They had all left by the 24th of September, except one bird, but I did not see it after that date. Owing to the rain, the water had risen somewhat, and though the birds' legs were long, they had not the same chance of getting food. These birds were much more easily approached than some of the waders I am acquainted with. The ruff seems to be a very noiseless bird during its movements with us in the autumn, as I never heard one of these utter a sound of any kind. This species is another addition to the Beith list.

GREAT-CRESTED GREBE (*Podiceps cristatus*).—A pair of this species was seen on Kilbirnie Loch, in May, 1912, and a nest with one egg was found near the edge of the loch in the same month. Since then, a pair has been seen every summer on Kilbirnie Loch. Probably they are the same birds. This is another addition to the Beith list.

CANADA GOOSE (*Bernicla canadensis*).—For a long period Canada geese in large numbers have been a pleasant feature in the bird-life of Castlesemple Loch, and have been familiar to visitors. Now, I believe, they have disappeared. A party from Muirshields which had taken the shooting destroyed them all, unless one, in 1914, and I am told it, too, has now disappeared.

On *Matricaria discoidea* DC. in Central Scotland.

BY JOHN PATERSON.

IN a communication to *The Glasgow Citizen* Natural History Notes column, which appeared on the 31st of July, 1915, "R. G." (Mr. Robert Grierson, a former member of this Society) wrote as follows, regarding the occurrence on waste ground in the West of Glasgow of the plant whose name appears above:—"About the same district an alien is now well established which you will not find in Henney [i.e., in Roger Henney's *The Clydesdale Flora*]. It is *Matricaria discoidea*, a daisy much resembling the scentless mayweed with fine leaves; so much does it do so that it has probably been taken for a rayless variety of this. The plant is more stunted than the common sort, the outside white rays are wanting, the outside edge of the involucre is scarios, and if the receptacle is cut through with a penknife it will be found hollow. This daisy grows opposite the Maryhill gasometers, near cottages on the other side of the canal about Anniesland, and is abundant at one or two spots on the road from Knightswood to Drumchapel, on the left past the large shale heap. It seems to have been growing there for many years. . . . The plant seems to be spreading, and will likely form a troublesome weed where it gets established."

This is the first notice which has appeared of the occurrence of *Matricaria discoidea* DC. (*M. suaveolens* Buchanan) in the Glasgow district. It is worthy of note, however, that in the *Transactions of the Stirling Natural History and Archaeological Society* for 1891-92, published in the latter year, in a list of plants in a paper entitled "Notes on the Flora of Stirlingshire, with short geographical sketch of the ground," by Colonel Stirling of Gargunnoch and Robert Kidston, F.R.S.E., F.G.S., No. 768d, is *Matricaria inodora* var. *discoidea*, and is said to occur (but no further particulars are given) in District II (the carse land bordering the River Forth, extending from the mouth of the River Avon in the east to Flanders Moss in the west).

It is strange that this plant has been established for a long period in the Glasgow district, and that not till 1915 has public attention been called to the fact. The paragraph from *The Glasgow Citizen*, quoted above, led to the writer receiving some interesting letters from Mr. William Rennie, to whom it appears the plant has been known in the West of Glasgow from his early years, under the not inappropriate name of "Appleringie Daisies." The date is fixed approximately by the fact that Mr. Rennie's father died on 28th December, 1891, and in his father's company, in the two or three years preceding this date, he had been familiar with the plant. But Mr. Rennie should tell his own story. He writes under date 19th September, 1915 :—" I first became acquainted with this plant two or three years previous to 1891, practically on its present site in Great Western Road opposite the boating pond, so it has been there all those years, but its other station further west the road, on the footpath of a newly-formed street on the eastern side of Great Western Road N.B. Station, must be comparatively recent. I have also recollections of the plant growing on Hamilton Hill brickworks just after they stopped, and on the adjoining quarry after it was filled up. This would be some time about 1895. All the ground is used now by the City Saw Mills for wood yards. I have seen no trace of it there for years. In 1898 and 1899 it was growing on the farm lands of Ashfield, Possil, on a track leading down to the old blaes bing, but never became established. When the present vacant ground between Saracen Cross and Possil N.B. Station, on the western side of Balmore Road, was being raised to its present level, 1894-1901, this plant occasionally occurred on the part between Bilsland Drive and the station, but I never found it on the other part when the quarry was being filled up. In 1902-3 this plant again figured amongst the great collection of rare plants that were found on the famous Bilsland Drive coup. I have found it in other places, but nowhere plentiful. In the first-mentioned place it is plentiful, but it is confined to a given area there."

Remembering that Mr. Jas. G. Robertson, a former member

of the Society, was also familiar with the plant, Mr. Rennie wrote to him, and in January, 1916, received a letter from British East Africa, in reply, from which the following is an extract:—"I first met the plant in the year of the big Exhibition in 1900, on the occasion of what was the first botanical excursion I had to the East Coast. In the course of a few days' holiday in the Portobello district I did the ground between Portobello and Gullane, and found the plant in several places, and I recollect it was particularly abundant at Prestonpans, but I could not place it at all. I next found it when residing in the West Calder district, in two places, one somewhere between West Calder and Mid Calder (I cannot exactly give the exact station now), and again on the golf course at Bathgate. Next I found it at Williamwood Quarry [East Renfrewshire] in 1908, I think, and I showed it to several members of the Andersonian [Andersonian Naturalists' Society], yourself amongst them if I remember right, but could get no information about it, and could not trace it in any of the standard floras of Great Britain. I naturally thought it was only some casual introduction, so it went into my herbarium with a ?, and I have no doubt it is still there. I am sorry now that I did not pursue the matter further, but it was simply because I did not think it worth while, as I thought it might only be a sporadic weed, not being recorded in any standard flora of the country or the L[ondon] C[atalogue]."

As Mr. Robertson's interesting letter chiefly relates to East Coast localities, the following extract from a letter from Mr. William Evans to the writer may be inserted here:—"I first came to know it in 1902, when my son and I took to collecting aliens. We found it then in abundance on waste ground about Leith Docks and other places. Since that year I have observed it in many localities (Bathgate among them) in each of the three Lothians and Fife. I cannot recall any printed record of the plant in the district earlier than 1904. As an introduced and established species it is included in the last edition of Babbington's *British Flora* as occurring in E.S.I."

Mr. Laurence Watt wrote to me (14th September, 1915) that

he had not noticed it at Clydebank where he resides, but had found it plentiful at Port Gordon, Banffshire, on the shore of the Moray Firth. Like others, he had no means of identifying it, but this Mr. A. Bennett, F.L.S., did for him.

Mrs. Ewing kindly informs me that in her late husband's herbarium are two plants—(1) from Symington, Lanarkshire, collected at the entrance to the railway goods shed by Gilbert Hamilton, on 5th June, 1906, and (2) from Castle Douglas, collected by Mr. Ewing in September, 1909.

Dr. Marcus Calder says it was plentiful about Loch Fad, Bute, seventeen years ago. In September, 1915, on the occasion of this Society's excursion to Barochan (Renfrewshire), it was found on the roadside as the party approached the entrance to the estate from Bishopton. Since attention was drawn to it in this locality, the writer and other members of the "Heavy Weather Club" have found it in the course of their rambles in the late autumn and early winter of 1915, as at Hamilton Hill, where it tails off towards the intersection of Possil Road and Bilsland Drive, at Jellyhill, beyond Bishopbriggs, and near Gad Loch, Lenzie.

Mr. Archibald Shanks found it growing freely towards the east end of Glasgow Green in the autumn of 1915. Subsequent to 1903, it seems to have been noticed in many English localities, but the information for Central Scotland supplied by Messrs. Rennie and Robertson, as given above, carries the narrative further back. It bids fair to become a very familiar plant in the Glasgow district.

In the report of the Phytographical Excursion in the British Isles, 1911, Mr. G. C. Druce says, in the *Botanical Exchange Club of the British Isles*:—"The rapid advance of this American species through Britain is most remarkable. It follows the roads, and may owe its origin in many cases (as *Juncus tenuis* probably does) to American fodder or corn. It was noticed near Sutton Broad,* Norfolk E. 27, Derby 57, Yorks S.W., 63, Lancashire 59, Cumberland 70,* Westmoreland 69, and in Co. Galway, Dublin, and Cork."*

* Means that the plant is an addition to the records in Watson's *Topographical Botany* and Mr. Arthur Bennett's Supplement.

Note.

On the Common Weasel and the name "Cane."—Anyone who has seen a series of specimens of the Common Weasel on a gamekeeper's gibbet or in a museum must have observed the considerable differences shown in size. There is, however, no true or real *variety*, in the specific sense, as only one species occurs in the British Isles, the most correct scientific name for which seems to be *Putorius nivalis*, Linnæus. The females are smaller than the males, the average length (body and tail) being 9 inches and $10\frac{3}{4}$ inches respectively. In Scotland, many country people believe that there are two separate Weasels, which they call the Big Brown Weasel and the Mouse-killer, thus drawing a distinction from the misleading character of size. John Colquhoun uses the name "Little Cane" as a synonym for the Mouse-killer, and ranks this along with the Common Weasel and the Stoat as "three varieties of Weasel." (*The Fera Nature of the British Isles*, 1873, p. 26). Zoologists, however, recognise only two true species in Scotland, namely, the Weasel and the Stoat.

The name "Cane," as applied to the Weasel, is not native to Scotland, and is not found in Jamieson's *Scottish Dictionary* or in any of the district volumes of the *Vertebrate Fauna of Scotland*, by Mr. J. A. Harvie-Brown and other writers. It sometimes takes the form of "Kine" or "Keen" in Hampshire, Sussex, and Kent, and perhaps also in other counties in Southern England, and apparently designates unusually small female or not fully-grown Weasels. Probably "Cane" gained currency from its use by Gilbert White (*Nat. Hist. of Selborne*, Letter XV., 1768), where he speaks of intelligent country people giving the name "Cane" to "a little reddish beast, not much bigger than a field-mouse, but much longer."

The name has only a brief history, and its derivation seems to be unknown. It is entered as obsolete in the *New English Dictionary* (Murray's), and 1750 is the earliest date given for it in Wright's *English Dialect Dictionary*, the locality being Hertfordshire.—HUGH BOYD WATT.

Excursions.

DALSERF, 8th May, 1915.—Conductor, Mr. John R. Lee.—This excursion, which was held jointly with the Botanical Section of the Andersonian Naturalists' Society, took place in fine weather, although exceptionally cold for the season, the attendance numbering 20. The party, detraining at Dalsarf, proceeded to Garrion Bridge, where the Clyde was crossed, and the road followed to Jock's Gill, thence by Milton Lockhart and along the right bank of the Clyde to Crossford. The backward state of the vegetation rendered the botanical results somewhat meagre. The orchards, as usual at this time of year, constituted one of the chief features of the landscape. The blossom of the apple was not as yet apparent, but the pear and plum trees were in full flower, while here and there among the native vegetation the gean was observed making a gay decoration to the delightfully varied greenery of the May-time woods. Of the plants observed in flower, the most abundant were the wood-sorrel, ground-ivy, and opposite-leaved golden saxifrage; whilst the wood-anemone, sweet cicely, meadow-saxifrage, leopard's bane, and red campion were also noted. The wood stitchwort (*Stellaria nemorum*) was found in considerable abundance on the river bank, and the alternate-leaved golden saxifrage (*Chrysosplenium alternifolium*) was gathered in Jock's Gill. A striking feature of the vegetation of this district is the extraordinary abundance of the garlic-mustard (*Sisymbrium alliaria*), which occurs along the road-sides and in the hedgerows everywhere. Most of the plants were only in bud. The wood hyacinth was just beginning to appear, and the wonderful effect of its bloom in the woods of Milton Lockhart, which on former occasions made a visit to this locality in early summer a thing to be remembered with peculiar delight, was in this instance wanting.

Mr. John Paterson reports as follows regarding the birds:—
“The district visited is one of the best adapted in all the Clyde area for sylvan warblers and hirundines, and, at the worst, always presents features of interest during summer. The harsh east wind prevailing militated very much against successful

observation on the occasion of our visit. Several young ornithologists who were present expressed their pleasure at seeing together at Dalserf the swallow, house and sand-martins, and the swift. Even the oldest among the ornithologists were pleased to have the opportunity of examining recent borings, at the base of willows by the roadside behind Mauldslic, made by the great spotted woodpecker (*Dendrocopus major*) when in search of the larvæ of *Sesia bembeciformis*. In the *Glasgow Naturalist*, Vol. III., p. 97, it is reported, on the authority of Mr. Wm. Rennie, that similar borings were seen by him and Mr. Pettigrew on gate-posts in this neighbourhood, now several years ago. The garden warbler was heard at Jock's Gill and again by those who returned late by Fiddler's Gill. The whitethroat and sedge-warbler were heard, but were very far from being in full numbers. The cuckoo, common sandpiper, and willow-wren were conspicuous. The kingfisher (*Alcedo ispida*) was seen on the Clyde. The absence of the wood-wren, blackcap, and yellow wagtail was a disappointment, but the conditions were very harsh; however, no visit to this region at this season is ever altogether disappointing, as the above record will show."

TOLLCROSS PARK, 16th June, 1915.—Mr. David Wilson, Conductor (in the unavoidable absence of Mr. James Whitton, Superintendent of Parks, Glasgow).—Mr. Wilson, who has been associated with Tollcross Park since it was acquired by the City, conducted a party of twenty-six members and friends—the glass-houses, grounds, gardens, glen, nursery, and rockery all being visited in turn. In the glen the mandrake (*Podophyllum*) continues to flourish, and is always a source of interest to botanists. Tollcross is lucky in the possession of several red flowering chestnuts, which are exceptionally fine specimens for this district, and Ledebour's honeysuckle (*Lonicera Ledebouri*) and the scarlet fruited evergreen thorn (*Crataegus Pyracantha*) (the latter on a wall) are so fine that they would not disgrace any district. In the nursery the trees that attracted most attention were *Salix violacea*, *Pyrus vestita*, *Quercus conferta*, and a curious ash with small "maidenhair"-like leaves (*Fraxinus dimorpha* var. *dumosa*).

FIN GLEN, 14th August, 1915.—Conductor, Mr. George Lunam.—The dreary, thundery morning of this date doubtless determined the small number that turned up to this excursion, but at Campsie Glen Station it was soon seen that a good afternoon was in store for the party. Proceeding westward for a short distance along the Strathblane Road, a side road leading to Fin Glen was reached. The course of the stream was pretty closely followed. In the lower part of the Glen, some very fine clumps of *Campanula latifolia*, L., were found in prime condition, a few of the specimens, especially in the denser wooded parts, being pure white in colour. The most pleasing find of the day, however, was a beautiful bed of *Agrimonia Eupatoria*, L. Not often does one come across such a large mass of the plant as was here found; the plants were excellently grown, and were flowering profusely, the long, graceful spikes giving the bed quite an attractive appearance. The up journey had been made on the left bank of the stream, so, on returning, the right bank was followed as far as possible, and in one of the deeper parts some very good examples of the Ballagan beds were observed. Besides the two plants mentioned, *Circæa alpina*, L.; *Lysimachia nemorum*, L.; *Saxifraga hypnoides*, L.; and *Calamintha clinopodium*, L., were the principal flowering plants observed.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII., No. 2.]

[November, 1916.

Johnstone Shearer.

THE subject of this notice, who was a native of Aberdeen, died on the 11th of April, 1916, in his ninetieth year, at 45 Melville Street, Pollokshields, the residence of his son, Colonel Shearer, C.B., D.S.O., and was interred in Old Machar Churchyard, Old Aberdeen.

Mr. Shearer was admitted to the membership of this Society in November, 1886, and a few years later was elected as a Member of Council. In his thirty years' connection with the Society his was a familiar figure at meetings and excursions, and this familiarity was kept up in surprising measure, despite the very advanced age he reached before the end.

He came to Glasgow over thirty years ago from Torquay. Before he went to Torquay he spent seven years at Bridge of Allan, to which he had gone from Newcastle-on-Tyne where he had resided for two or three years. He must have been a competent field botanist from the time he left Aberdeen. At the various places to which his business led him, the leisure he could command was taken up largely with the investigation of their flora, and when he appeared here, the acquaintance he showed with the British Flora was full and accurate. It must have been a matter of special interest to him, and an inspiration, to come into the Society at the time he did, as many of the prominent members then were accomplished

botanists. His own qualifications gained for him, in that comparatively critical time for botanists, immediate respect, and this was maintained throughout association with our members. To our *Transactions* he made several contributions, and he exhibited plants at our meetings frequently. He supported our excursions enthusiastically until failing strength prevented his attendance.

Mr. Shearer joined the Andersonian Naturalists' Society, of this city, in 1888, and attended many of that society's excursions for some years thereafter. He published in the first volume of the *Annals of that Society* (1893) a paper on "The Flora of Stirling and its Neighbourhood." The paper was a model of its kind.

Educated in Aberdeen, he intended to follow the law as a profession, and spent several years in a solicitor's office. About this time photography, which was then a new art, engaged his attention as a hobby, and having revealed some notable dexterity in his manipulation of the processes then in vogue, he drifted into photography as a business. In this business he achieved considerable success, and had as a partner Mr. G. W. Wilson, whose name became widely known through the topographical pictures which the firm that bore his name were the first to do on an extensive scale. On the question of the style of the firm disagreement arose and the parties separated.

When Mr. Shearer joined our Society, photography began for the first time to be widely associated with natural history, owing to the evolution of convenient methods. In this department he found a new sphere of usefulness, but it is to be regretted that, from want of organisation, a good deal of photographic matter, interesting historically, is likely to be permanently lost, and with it many valuable pictures by Mr. Shearer.

The intimation of his death must have carried to many members of this Society the sense of a great personal loss. He had a genius for friendship, and kept in touch till the last with co-workers in natural history in this district. He

had a great spirit which sometimes dragooned a frail body beyond endurance. But no adventure was entered upon in a spirit of braggadocio. He could match his mind with that of a younger man in argument, and greatly delighted in a little raillery and chaff. All this helped to keep him in line with those younger than himself, and the virility of his mind enabled them to accept him at his own valuation. He had a strong nature, but all experience showed him to be incapable of rancour. Integrity of mind and purpose was his great characteristic.

In nature he took perpetual delight, and it is pleasant to think that, at a period in his life when disaster and bereavement threatened to overwhelm him, his greatest consolation was found in the prosecution of those botanical researches in the field to which he had long devoted his leisure. That Nature never did betray the heart that loved her was literally true in his case.

On the Little Gull (*Larus minutus*) and other Rare Birds near Glasgow.

By D. MACDONALD.

[Read 30th May, 1916.]

SHOVELER (*Spatula clypeata*). (1) A ♂ observed on a marsh near Summerston on April 30th, 1916; (2) another ♂ observed on a marsh between Summerston and Bardowie on May 26th; and, (3) on 27th May, a ♀ seen on a marsh near Summerston.

Above points to the possibility of the species being found nesting in the immediate neighbourhood.

GADWALL (*Anas strepera*). On the 9th of May I watched for over an hour a male bird of this species on Bardowie Loch. Besides the white mirror on the wing, so distinctive of this

surface-feeding duck, the black rump, upper and under tail coverts, and feathers round vent were very noticeable, as, with head under water, it appeared stern upwards. Usually recorded in the Clyde Area as a winter visitor, and that somewhat rarely. Never previously seen by me in the district.

PIN-TAIL (*Dafila acuta*). Three (one ♂, two ♀'s) seen on a marsh near Summerston, on 16th May. I met with this species on Clyde only once previously, off Langbank, when accompanying an excursion of the Andersonian Naturalists' Society.

LITTLE GULL (*Larus minutus*). On 16th May, while watching the last-mentioned species from the shelter of a hedge, my attention was at once arrested by a small Gull showing markings externally on the wing which differed from those that would appear on *Larus ridibundus* at any stage. It was at once clear to me that this little stranger was palpably smaller than any of the *L. ridibundus* which were on the edge of the marsh at the same time, being about the size of a Missel-thrush, with, of course, relatively longer wings. It was hawking for small diptera which were pupating or about to pupate on the surface of the water, and was accompanied by Swallows and Sand-martins, also engaged in the same occupation. Its method of catching its insect prey was precisely that of the hirundines, only that occasionally it rested on the surface of the water, with wings vertically uplifted, just like a Night-jar, picking the diptera that were emerging, now from the surface, again from an inch or so beneath the surface. Most of its prey was secured at from six inches to two feet above the surface of the water, although sometimes at an altitude of nine or ten feet above the level. It continued at this work for about a quarter of an hour, and then rested for a similar period. I remained in the company of this little stranger from the land of the Czar (I was convinced even then it could be none other than *L. minutus*). I proceeded home, and consulted Dresser and Seeböhm. The latter states that *Larus minutus* procures its insect prey after the

manner of a Swallow or Goatsucker, and that its flight is somewhat desultory. This was entirely corroborative of my correctness of identification, but complete satisfaction was got, and all doubt allayed, when, through the kindness of Mr. M'N. Campbell, of the Kelvingrove Museum, I was enabled to examine a specimen of an immature *Larus minutus* in exactly the same state of plumage as the living bird observed by me.

Mr. Campbell told me that the bird under his guardianship was purchased a good many years ago, and was procured in the North Sea, off the English Coast.

FROM MY SCRAP JOURNAL.

May 18—To Bardowie.—*Larus minutus* flew away from the edge of the marsh when put up by me while resting.

May 19—To Summerston.—*L. minutus* again seen hawking insects—7 p.m.

May 20.—Along with Mr. John Robertson, *L. minutus* seen hawking insects in a higher stratum of air.

May 21—To Bardowie, via Possil.—A common Tern seen along with *L. minutus* at marsh between Summerston and Bardowie. Found Mr. John Robertson at marsh on my return from Bardowie.

May 22.—To Summerston along with Mr. Hugh Wilson. Little gull gone.

On some Eucalypti in the West of Scotland.

By JOHN CAIRNS.

[Read 24th April, 1916.]

Eucalyptus urnigera, Hook f.: the URN-BEARING GUM, native of Tasmania. Dr. Landsborough, in the *Transactions of the Botanical Society of Edin.*, vol. xxiii, states that it

attains a height of 150 feet in Tasmania, but in *Trees of Great Britain and Ireland* (Elwes and Henry), it is said occasionally to reach 50 feet. The date of its introduction to Britain is uncertain, but Hooker says it was in cultivation in England in 1860. The trees at Stonefield, Tarbert, Loch Fyne, are possibly the finest in Scotland. They were raised from seed by the late gardener, Mr. Robertson, in 1881. Dr. Landsborough gives the following measurements in 1895:—height 38 feet, girth 2 feet 3 inches at 5 feet; and in 1905—height 71 feet, girth 4 feet 4 inches at 5 feet, spread 30 feet. Dr. Henry gives the measurement of one tree at Stonefield in 1910—height 81 feet, girth 5 feet at 4 feet from the ground; and he remarks “that the forester, Mr. Stewart, states that it has never been injured by frost since it was planted out. It had been known erroneously both as *E. Gunnii* and *E. coccifera*.”

The measurements sent me by Mr. Johnstone, the gardener, in December, 1915, are as follows:—

No. 1,	girth 6 feet 10 inches at 5 feet,	bole 30 feet.
.. 2,	.. 5 .. 6 .. 5 25 ..
.. 3,	.. 5 .. 5½ .. 5 10 ..
.. 4,	.. 4 .. 6 .. 5 30 ..

The length of bole is only approximate—no exact measurements were taken.

I presume the measurements given by Dr. Landsborough and Dr. Henry must have been for the largest tree of the group.

Dr. Landsborough states that a tree at Kinloch-Hourn, Invergarry, Inverness-shire, was 24 feet high in 1905, and that “it is the tallest tree in Scotland.” This, of course, is incorrect, as we know that one at Stonefield was 71 feet high in that year, according to Dr. Landsborough’s own measurements, but he was under the belief the tree was *E. Gunnii*.

Eucalyptus coccifera, Hook f.: Mountain Peppermint. This is one of the hardiest species, and forms a very elegant tree, which in Britain attains a height of 70 feet or thereby.

The leaves and branchlets on young trees are frequently covered with a bluish-white bloom. The tree at Stonefield, Tarbert, was raised from seed in 1881; in 1895, according to Dr. Landsborough (*loc. cit.*), it was 21 feet high, with a girth of 15½ inches at 5 feet; it flowered in 1895. In 1905 he states the height to be 26 feet 8 inches, with a girth of 2 feet 4 inches at 5 feet, spread 18 feet. In 1910 Dr. Henry states it was 47 feet high, and 2 feet 8 inches in circumference at 4 feet from the ground, and adds, on the authority of the forester, that it had never been injured by frost. Mr. Johnstone, the gardener, reported to me in December last that it girthed 3 feet 6 inches at 5 feet, with a clean bole of 18 feet. The other specimen exhibited is from Castle Kennedy, Wigtownshire, and I am informed by Mr. W. Cruden, the gardener, that it was planted in 1900, and in March, 1916, measured 27 feet 6 inches in height, with a girth of 1 foot 7 inches at 5 feet from the ground.

I have also a record of a small tree at Ardchapel, Shandon, which the gardener tells me was planted out ten years ago. It is 15 feet in height, with a clean bole of 6 feet, and 9 inches in girth at 5 feet from the ground.

Eucalyptus Gunnii, Hook f.: Cider Gum. According to Dr. Henry (*Trees of Great Britain and Ireland*, vol. 6, page 1639), this is a small tree usually 20 to 30 feet high in Tasmania, but occasionally attaining, in sheltered places, a height of 80 feet. It has scarcely any of the pungent odour so common in many other species. The typical form of *E. Gunnii* was discovered by Sir J. D. Hooker, in 1840, forming a forest of small trees in swampy soil at elevations of 3,000 to 4,000 feet in the centre of Tasmania, where it is known to stock-keepers as yielding abundantly an agreeable sap, and hence is called Cider-tree or Swamp Gum.

This species was introduced, shortly after its discovery, into Kew Gardens, being the first Australian tree that was cultivated in the open air in England.

The two specimens exhibited from Castle Kennedy were raised from seed by Mr. Cruden, and planted out in 1900;

one of them is now 43 feet high, and 2 feet 6 inches in circumference at 5 feet from the ground; the other is 30 feet high, and 14 inches in girth at 5 feet. These measurements were taken in March, 1916.

The other specimen I exhibit is from Bellfield, Kilmarnock, and Mr. W. Heughan, the superintendent, writes me about it as follows:—"The Eucalyptus at Bellfield planted by the late Dr. Landsborough is still growing. It reached a height of 18 feet, but two years ago it got a little blasted by a storm, and I had to cut 6 feet off the top. At present it is 12 feet high, but is of very slender growth, owing to its position; it is close to a high garden wall on one side, and tall trees on the other, and this has drawn it up. The girth, 5 feet from the ground, is about 9 inches. I have never observed any seed vessels, but it is quite healthy."

According to information received from the present gardener, the tree at Piersland, Troon, said by Dr. Landsborough to have been planted there in 1905, no longer exists.

Eucalyptus globulus, Labillardière. The Blue Gum was discovered by Labillardière, in 1792. It is a native of Tasmania, Victoria, and New South Wales.

In Scotland this species cannot be considered to be hardy. In its young state it is of very rapid growth, and soon makes quite a good specimen, but the first severe winter either kills the tree outright, or at least causes so much damage that its dimensions are seriously curtailed. Dr. Landsborough states that in the severe winter of 1880-1881 all the Blue Gums on the mainland of Scotland were killed, including those at Stonefield, Lochfyne, and all in Arran, except a tree at Lamlash, which, however, was blown down in 1892, when it was over 40 feet high.

The flowers of this species are curious and interesting. The flower-bud is covered with a cap, which, as the flower develops, is pushed off in one piece, and the yellow anthers previously closely packed within the cap are left exposed. On young trees the leaves are sessile, opposite, and bright

blue-grey in colour; on more mature trees they are petiolate, alternate, sickle-shaped, and dark greyish-green.

The Blue Gum is one of the most characteristic trees of Australia, where it attains a great height. Its timber is hard and durable. Flowering-shoots are imported in great quantity from Italy, and sold in Covent Garden for decorative purposes.

The specimens from Castle Kennedy are from the tree to which Mr. Elwes refers in *Trees of Great Britain and Ireland*, where he says: "I saw, at Castle Kennedy, in 1906, a tree about 25 feet by 2 feet, which had grown from the stump of one killed in 1895-1896." Mr. Cruden informs me that in March, 1916, it was 50 feet in height, girth 2 feet 4 inches at 5 feet from the ground.

The other specimens of this species are from the Winter Garden at Springburn Park, Glasgow, and are merely shown for comparison.

Eucalyptus ficifolia, Müller. This species is a native of New South Wales, but unfortunately is too tender to grow in the open in Britain.

In *Trees of Great Britain and Ireland* the following remark is made upon it:—"This was reported to have flowered in the open air at Cove House, Tiverton, Devon, but Mr. W. North Row informs us that this is an error, as the plant is growing in the border of a cool greenhouse. At Monreith, where it was growing on a south-west wall, it was killed in the severe winter of 1908-1909."

It bears large scarlet flowers, and is possibly the most beautiful in this respect of the whole genus.

The specimen exhibited is from the Winter Garden at Springburn Park, where Mr. Thompson, the superintendent, tells me it has flowered well.

On an Ayrshire Great Grey Shrike (*Lanius excubitor* L.).

By J. RITCHIE, Jun.

[Read 20th January, 1916.]

THIS unusual visitor was caught alive by Mr. Robert Butcher Birds, attracted by the decoy, appeared. One of them limestone quarry near Roughwood, Beith; its method of capture being very similar to the account of Blackwall, as given in Yarrell's *British Birds* (vol. 1, 3rd ed.).

A decoy Redpole had been set near some limed twigs; two Butcher Birds, attracted by the decoy, appeared. One of these alighted on the limed twigs, and was quickly transferred by Mr. Kennedy to a cage, the other flying on, uttering its cry of "shack, shack." The latter specimen was seen a fortnight later (the 18th December) in the same locality. The captured specimen was fed on a Redpole, ants' eggs, and bread and milk, but died on the 7th December, and was sent to Mr. Chas. Kirk to be set up.

I had the carcase returned to me by Mr. Kirk, and on examination found an immature ovary, with ova in its early stages, the size of the latter varying from .02 mm. to .09 mm. in diameter, and these assumed various shapes from oval to round, according to the pressure applied to their surface; this evidence proving that the captured specimen is a female.

As there are several differences in the descriptions given by various writers on the coloration of this species, the following particulars may not be out of place:—

The total length is $9\frac{3}{4}$ inches, the breadth from tip of wing to tip of wing $13\frac{1}{2}$ inches.

The upper mandible of the bill is black as far back as the nasal apertures, where it gradually becomes yellowish. It is strongly curved at the tip, and has a sharp tooth, upon which the tip of the lower mandible meets when the bill is closed; the tip of the lower mandible is black, turning to a yellow

colour at the base. Surrounding the base of the bill are several stiff hairs projecting forward, these being black on the upper, and white on the lower, side of the bill. The lores, and below the eye back to the ear coverts, is black, while above the eye there is a white streak. The crown, rump, and back are pearl grey; the under part of the body is a light-grey colour, near the tip of each feather there is a thin crescent of a darker shade, which gives the ventral surface a slightly vermiculated appearance. The wings and tail feathers are black,* the scapulars pearl-grey, tipped with white; marginal coverts pearl-grey; minor coverts black; secondary coverts black, tipped a brownish white colour. Ten primary remiges, the inner four tipped with white, the outermost one all black, the others with a single broad band of white at their bases. The secondary remiges are all tipped with white. On the underside of the wing the remiges are half pearl-grey (distal portion) and white (basal portion). The rest of the underside of the wing is white, except the primary coverts, which are pearl-grey. Bastard wing black. The central tail feather tipped brown, the others tipped with white until the outer tail feathers are almost all white: the covert feathers of the tail are also tipped with white, the under side having the same coloration as the upper surface. Eyes brown, legs and feet black. The tongue at its point was squared, with a slight notch in the centre, and having a black margin all round its anterior surface.

THE TREMATODE

Leucochloridium macrostomum (Rud.) FROM INTESTINE OF
THE GREAT GREY SHRIKE. NEW TO BRITAIN.

In the intestine of the above Shrike I was fortunate to obtain three specimens of *Leucochloridium macrostomum* (Rud.), otherwise named *Urogonimus* (Monti). Lühe gives

* Very dark brown, nearly black, would probably have been a better term to use, as the nearest approach to a pure black colour was in the minor coverts.

a description of it in Part 17, *Die Susswasser fauna Deutschlands*, as follows:—"Small compact distomum rounded at the ends, oval in transverse section; it has good muscular power, the suckers being large and powerful; the skin may be either smooth or rough; a strong pharynx, very short cesophagus and long slender intestinal canals extending to the hinder end of the body; the excretory pore is on the dorsal surface, but not quite terminal, the bladder being short and simple; the genital opening is terminal, with a cirrus pouch present, but this only encloses the cirrus and ejaculatory duct—the short Pars Prostatica like muscles, and a seminal vesicle, lying free in the tissues of the body. Testes lateral and oblique, one behind the other, the end being drawn out like a needle; the ovary lies between the testes; the receptaculum seminalis is defective. Laurer's canals are present; the yolk glands are at the sides of the body, lying on the outside of the intestines; the uterus is thick and winding, turning wholly round at the anterior part of the ventral sucker; eggs numerous, and with a thick shell."

Mature specimens range from 1 to 2 mm. in length.

Gamble, in the *Cambridge Natural History*, describes the life-history of this parasite, and mentions that it is unknown in England; while Lühe, in 1909, states that it has hitherto only been recorded in Germany; yet I am of opinion that it may only have been overlooked in this country, as in November of last year I obtained five examples in the rectum of the Starling (*Sturnus vulgaris*). Some of the examples obtained by me do not coincide with Lühe's description, as, while observing some alive, I noted that the cirrus and genital pore were not terminal but dorsal, yet when compressed these organs have the appearance of being terminal. In one* of the specimens shown (not compressed) the cirrus is seen quite distinctly to be on the dorsal surface; I do not think that this observation warrants the making of a new species, as an examination of the figures of a young distomid within the

* In all the specimens obtained the cirrus was exerted from the dorsal surface.

shell, as shown both in Lühe (above, page 209) and in the *Cambridge Nat. Hist.* (vol. 11, page 65), will show that these organs are a little anterior to the termination of the body.

The early stage of this digenetic termatode is passed within the body of *Succinea putris*; when this thin-shelled snail becomes infested the head region becomes greatly swollen, the tentacles then assume coloured bands of green and white, with red terminal spots. I should be very pleased to learn if any of our members have come across any snails showing this abnormality.

MITE FROM THE GREAT GREY SHRIKE, &c.

I also have under the microscopes so kindly lent by Mr. Wm. Cousin several slides of two different Mites, measuring about $\frac{1}{57}$ inch in length, and some of these, with long hairs $\frac{1}{115}$ inch long. These were obtained within the bronchi of the Shrike, and although the bird had been dead for five days, these were still alive when that organ was examined.

It may be of interest to record that, on the examination of the nasal cavity, trachea, and bronchi of several birds (Passeres) during spells of severe frost and cold weather, I have often found Mites in these organs.

I have also taken similar Mites from within the trachea and bronchi of two mammals, viz. :—the Squirrel (*Sciurus vulgaris*) and Stoat (*Mustela erminea*). A noticeable feature of the female Mite is that, when compressed under a microscopic cover-glass, the integument ruptures at the posterior end of the animal, and allows a single larval Mite to emerge in its hexapod stage of development.

**Some Records of Coleoptera from Cantyre
(Vice-County No. 101).**

By ANDERSON FERGUSSON.

[Read 27th June, 1916.]

THE Watsonian Vice-County No. 101 comprehends the long peninsular extension of the County of Argyll, which lies to the south of the Crinan Canal, and includes the districts known as Knapdale and Cantyre. The Vice-County, from its situation, its variety of land surface and extensive coast line, presents many features of interest to the entomologist as well as to the student of natural history in other aspects. Notwithstanding its attraction as a collecting ground, Cantyre, like most other outlying parts of the British Isles, has not received much attention from coleopterists; but it will be seen from the bibliography appended to this paper that a few notes and articles dealing with its beetle fauna have been published from time to time. The most important of these is the paper by Commander J. J. Walker, R.N., in which 86 species are recorded from the Campbeltown and Maerihanish district, where the Commander collected during parts of the years 1894 and 1895. As a further contribution towards a knowledge of the Coleoptera of the area it has occurred to me that it might be of interest to note the species which I met with during a couple of visits made to the Vice-County some time ago.

The first of these visits took place during the summer of 1901 in company with Mr. A. A. Dalglish. The village of Tayvallich, where we put up, lies in the north-west corner of the Vice-County, and the surrounding country, which is described by Professor Graham Kerr in his paper upon Loch Sween, published in *The Glasgow Naturalist*, Vol. IV, p. 33, does not appear to have been previously investigated for Coleoptera. Most of the beetles noted are generally distributed throughout the kingdom, but a few are of a more

local type of distribution. The list which follows is not, however, to be taken as anything like exhaustive of the coleopterous fauna of the district. In fact it probably forms a pretty meagre representation of that fauna, as the end of July and beginning of August, when we made our visit, is perhaps about the worst season of the year for collecting Coleoptera. The spring and early summer forms have then gone off, while the species usually found in autumn have not made their appearance. Only six species are common to Commander Walker's list from Campbeltown and Macrihanish and the Tayvallich list; but this is probably accounted for by the fact that Commander Walker only mentioned in his paper the more noteworthy species encountered by him.

In the Geodephaga the best capture was *Elaphrus uliginosus*, F., of which a single specimen was found near the village. *Loricera pilicornis*, F., *Bembidion ustulatum*, L. (*litorale*, Brit. Cat.), and *Trechus quadristriatus*, Schrank. (*minutus*, F.), all common species, occurred in wet places. *Harpalus latus*, L., *Amara aulica*, Pz., *Pterostichus nigrita*, F., and *P. madidus*, F., occurred under stones. *Olisthopus rotundatus*, Pk., *Agonum ruficorne*, Gæze. (*albipes*, F.) and *A. mülleri*, Hbst. (*parumpunctatum*, F.) were also noted in damp places.

No special collecting for water beetles (Hydradephaga) was attempted and only *Hygrotus inæqualis*, F., and *Hydroporus 12-pustulatus*, F., both widely-distributed species, were noted.

In the aquatic division of the Palpicornia *Hydrobius fuscipes*, L. and *Philhydrus fuscipennis*, Th. were swept in a marshy spot near the village, while *Laccobius alutaceus*, Th. was found on the shores of Loch Taynish. Amongst the terrestrial Palpicornia, *Sphæridium scarabæoides*, L., *Cercyon ustulatus*, Preys. (*hæmorrhous*, Gyll.), *C. hæmorrhoidalis*, F. (*flavipes*, F.), *C. impressus*, Sturm. (*hæmorrhoidalis*, Hbst.), *C. melanocephalus*, L., and *Megasternum boletophagum*, Marsh, all occurred in cattle droppings. *Cælostoma orbiculare*, F. was not uncommon in damp moss.

Amongst the Brachelytra the following *Homalotæ* were found: *Atheta hygrotopera*, Kr. on the banks of Loch Taynish, a very large dark variety of *A. atramentaria*, Gyll. in cattle droppings, and *A. castanoptera*, Mann. (*xanthoptera*, Steph.) in fungi. *Sipalia circellaris*, Gr. occurred commonly in various situations, and *Bolitobius exoletus*, Gr. was found in fungi. *Philonthus æneus*, Ross. and *P. varians*, Pk. were taken under stones. *P. albipes*, Gr., which is rather a scarce species, occurred in moss. On the shores of Loch Taynish *Stenus nitidiusculus*, Steph. and *S. pallitarsis*, Steph. were not uncommon. The latter is local in its distribution. *Stenus tarsalis*, Ljun. and *S. brunripes*, Steph., both common species, also occurred in marshy places.

Of the Clavicornia, *Coccinella hieroglyphica*, L. was taken by sweeping, *Necrophorus investigator*, Zett. (*ruspator*, Gr.) under a dead bird, *Meligethes viridescens*, F. by sweeping various flowers, and *Atomaria atricapilla*, Steph. in vegetable refuse.

Only a few Lamellicorns were found, none of them of any rarity. *Aphodius fmetarius*, L., *A. rufipes*, L. and *A. depressus*, Kug. (black form) were the only species of this genus found in cattle droppings. *Geotrupes spiniger*, Marsh. was also found in the same situation and *Serica brunnea*, L. flying.

An interesting capture among the Click beetles (*Sternoxia*) was a very small black form of the common *Athous hæmorrhoidalis*, F., which, in the normal type, is of a brownish colour with only the head and thorax dark. Other members of this group noted were *Dolopius marginatus*, L., *Agriotes pallidulus*, Ill., and *Adrastus nitidulus*, L. (*limbatus*, Brit. Cat.) all taken by general sweeping.

At the time of our visit most of the Malacodermata or soft-bodied beetles were past, but the common *Helodes minuta*, L. was taken by beating Alders. *Cantharis pallida*, Gœze. (*bicolor*, Brit. Cat.) was the only representative of its genus. Two specimens of *Malthinus fasciatus*, Ol. were swept. The occurrence of this insect in Cantyre forms an interesting

extension of its range. The only other Scotch record is from Orchardton in Kirkcudbrightshire where it was taken and added to the Scotch list by Mr. W. D. R. Douglas.* *Malthodes mysticus*, Kies., a rare species, was also taken by sweeping.

The only representative of the Longicornia was a fine specimen of *Leptura* (*Strangalia quadrifasciata*, L. which I found resting upon Mr. Dalglish's jacket as we were walking through a wood south of the village.

Amongst the Phytophaga, *Plateumaris* (*Donacia*) *discolor*, Panz. occurred in a marshy place with *Lema cyanella*, L. (*lichenis*, Voet.) and *Prasocuris phellandrii*, L. *Phædon tumidulus*, Germ. was swept and *Lochmæa capreæ*, L. was obtained by beating Birches. By sweeping in a marshy spot one example of a *Galerucella* was obtained, probably off *Comarum palustre*. There is some doubt as to what species this specimen belongs, but it appears to be identical with the form known as *G. fergussoni*, Fowl., which was described from specimens found first at Possil Marsh by Mr. Dalglish and afterwards at Frankfield Loch by myself. Of the fourteen species of *Longitarsus* recorded for Scotland seven were found. *L. luridus*, Scop. was common by sweeping mixed herbage, and, as usual, varied in colour from deep black to light brown. A dark variety of *L. suturellus*, Duft. occurred commonly on Ragwort along with *L. jacobææ*, L. From the same plant two specimens of *L. gracilis*, Kutsch. were taken. *L. melanocephalus*, De G., *L. exoletus*, L. and *L. succineus*, Foudr. (*lævis*, All.) were obtained by general sweeping. The food plants were not discovered. *Crepidodera transversa*, Marsh. was common on Rushes, and of the difficult genus *Haltica*, one species, *oleracea*, L. was swept in some numbers, but off which plant I am unable to say. *Chætocnema* (*Plectrocelis*) *concinna*, Marsh. was common while *Apthona cærulea*, Geoff. (*non-striata*, Brit. Cat.) was locally plentiful on Iris.

The Weevils (Rhynchophora) were not so well represented as might have been expected. *Phytonomus* (*Hypera*)

* *Annals of Scottish Nat. History*, 1892, 107.

nigrirostris F. was common, and *Notaris* (*Eriirhinus*) *acridulus*, L. occurred in marshy places. *Cœliodes rubicundus*, Hbst. was obtained from Birches and *Balanobius salcivorus*, Payk. from Willows. On the latter tree also occurred *Rhamphus pulicarius*, Hbst. (*flavicornis*, Clairv.). Beating Oaks produced *Orchestes rusci*, Hbst. and *Anoplus plantaris*, Næz. came off Alder trees. One or two specimens of *Anthonomus rubi*, ab. *brunneipennis*, Curt. (*comari*, Crotch) were taken by sweeping in a marsh. On *Scrophularia nodosa* a single example of *Cionus tuberculosus*, Scop. was found. This insect, which appears to be very local in its distribution, has also been recorded from Main Argyll (Vice-County No. 98).* The only other Scotch record is one from Dollar in Murray's Catalogue of the Coleoptera of Scotland (1853), which, however, was considered rather doubtful by Dr. Sharp and Dr. Fowler. *Apion carduorum*, Kirby, *onopordi*, Kirby, *frumentarium*, Payk. (*hæmatodes*, Kirby), *violaceum*, Kirby, and *ervi*, Kirby, all occurred upon their respective food plants.

During September, 1912, I paid another visit to Cantyre, for the purpose of finding out whether *Dytiscus lapponicus* was to be found in any of the tarns on the peninsula. The weather conditions were atrocious. A westerly gale, with heavy rain, prevailed during the day or two of my stay, and made collecting an unpleasant and unprofitable occupation. While unsuccessful in the main object of my search, I came across a few species which help to swell the records for the Vice-County. At Machrihanish, work with the water-net in a little stream on the links produced the following running-water species:—*Hydroporus sanmarki*, v. *rivalis*, Gyll., *H. septentrionalis*, Gyll., *H. discretus*, Fair., *Laccobius nigriceps*, Th., *Elmis ceneus*, Müll., *E. parallelopipedus*, Müll., and *Limnius tuberculatus*, Müll.; while in sheep droppings on the sandhills *Aphodius fimetarius*, L., *A. rufescens*, F., *A. punctato-sulcatus*, Stm., and *A. scybalarius*, F. were found. The occurrence of the last-named species so far west is

* *Annals of Scottish Nat. History*, 1905, 56.

interesting, as previous records in Scotland have been exclusively from the east. At Bellochantuy, a few miles further north, the following were noted:—*Nebria brevicollis*, F., *Calathus fuscipes*, Goeze. (*cisteloides*, Panz.), *C. melanocephalus*, L., and *Pterostichus strenuus*, Pz., all common; *Hydroporus nigrita*, F., *Helophorus viridicollis*, Steph., and *H. granularis*, L. (*brevicollis*, Th.) in slowly moving water. Of the latter, which is rather a scarce species, four specimens were taken. Sifting some vegetable refuse produced *Aleochara lanuginosa*, Gr., *Atheta fungi*, Gr., *Othius melanocephalus*, Gr., *Xantholinus linearis*, Ol., *Catops grandicollis*, Gr., and *C. Watsoni*, Spence; while in cattle droppings *Cercyon hæmorrhoidalis*, F. (*flavipes*, F.), *Philonthus cruentatus*, Gmel., *P. varians*, Pk., and *Aphodius contaminatus*, Hbst. were found. At Dubh Loch, on the hills north of Barr Glen, I took *Hydroporus palustris*, L., *H. pubescens*, Gyll., and *Anacæna globulus*, Pk. commonly. *Agabus arcticus*, Pk. and *Ilybius ænescens*, Th. also occurred here, with *Gyrinus natator*, Scop. and two specimens of *G. minutus*, F. *Calathus mollis*, Marsh. was common on the shore at Tayinloan. At the same place *Cercyon melanocephalus*, L. occurred in refuse, and *Philhydrus fuscipennis*, Th. and *Limnebius truncatellus*, Thunb. were found in a ditch near the sea.

Of the 123 species mentioned in this paper, 107 have not previously been noted for the Vice-County. The total number of species recorded for Cantyre now stands at 210, a figure which could be greatly increased.

For assistance with the identification of the more critical species I am indebted to Messrs. F. Balfour-Browne, E. A. Newbery, W. E. Sharp, and J. R. le B. Tomlin. The nomenclature is that of the Exchange List of British Coleoptera recently compiled by Messrs. E. A. Newbery and W. E. Sharp.

LIST OF PAPERS AND NOTES CONTAINING REFERENCES TO
COLEOPTERA FROM CANTYRE (VICE-COUNTY No. 101).

Edwards, J.—“A Revision of the British Species of *Halipilus*, Latreille.” *The Entomologist's Monthly Magazine*, XLVII. 1.

- Fergusson, A.—“List of the Coleoptera of the Clyde Area,”
Natural History of Glasgow and the West of Scotland,
(*British Association Handbook*), 1901.
- Fergusson, A.—“Additions to the List of Clyde Coleoptera,
(Second Paper),” *The Glasgow Naturalist*, IV, 70.
- Fergusson, A.—“*Cionus tuberculosus*, Scop., in Cantyre.”
The Scottish Naturalist, 1914, 264.
- Ord, G. W. — “Entomological Reports.” *Annals of the
Andersonian Naturalists' Society* (Glasgow), II, 108.
- Walker, J. J.—“Coleoptera at Campbeltown, N.B.” *The
Entomologists' Monthly Magazine*, XXXII, 110.

Additional Records of Microfungi for the Clyde Area.

By D. A. BOYD.

[Read 27th June, 1916.*]

THE following have to be reported as recent additions to the list of Microfungi for the Clyde Area.

With the exception of *Phycomyces nitens* and *Morchella elata* var. *purpurascens*, all the species noted have been gathered by the writer in the respective localities mentioned. Grateful acknowledgment is due to Miss A. Lorrain Smith, F.L.S., and Mr. J. Ramsbottom, M.A., F.L.S., British Museum (Natural History), for their kindness in identifying the various species indicated as “New to Science” or “New to Britain.” Reference is made to the pages of the *Transactions of the British Mycological Society*, Vol. V., Part II. (published May, 1916), where these and many other new and rare species are fully noticed and described.

* A short communication on “New Records of Clyde Microfungi,” submitted to the Society on 26th October, 1915, is incorporated in this paper.

NEW TO SCIENCE.

- Rosellinia alchemillæ* A. L. Sm. and Ramsb., *T. B. M. S.*, Vol. V., p. 239.—On decaying leaves of *Alchemilla alpina*; Glen Falloch; May, 1914.
- Phyllosticta polemonii* A. L. Sm. and Ramsb., *op. cit.*, p. 244.—On fading leaves of *Polemonium*; Saltcoats, Ayrshire; July, 1914.
- Coniothyrium pteridis* A. L. Sm. and Ramsb., *l.c.*—On dead fronds of *Pteris aquilina*; Ardrossan; August, 1914. Also at Tarbet, Dumbartonshire; September, 1913.
- Ascochyta pseudacori* A. L. Sm. and Ramsb., *l.c.*—On a fading leaf of *Iris Pseudacorus*; Colintrave, Argyllshire; August, 1913.
- Stagonospora arrhenatheri* A. L. Sm. and Ramsb., *op. cit.*, p. 245.—On dead leaves and culms of *Arrhenatherum elatius*; Dalry, Ayrshire; August, 1913.
- Septoria leontodontis* A. L. Sm. and Ramsb., *op. cit.*, p. 246.—On leaves of *Leontodon autumnale*; Machrie Bay, Island of Arran; August, 1913.
- S. bromicola* A. L. Sm. and Ramsb., *l.c.*—On fading leaves of *Bromus mollis*; Machrie Bay, Arran; August, 1913.
- Discula junci* A. L. Sm. and Ramsb., *l.c.*—On dead culms of *Juncus communis*; Ardrossan; August, 1914. This species is common, and usually occurs on the very pale-coloured rush-stems which contain the sclerotia of *Sclerotinia Curreyana*.
- Sphaeridium foliicolum* A. L. Sm. and Ramsb., *op. cit.*, p. 247.—On fading leaves of *Salix pentandra*; Island of Cumbrae; August, 1914.
- Cercospora veronicæ* A. L. Sm. and Ramsb., *op. cit.*, p. 243.—In spots on living leaves of *Veronica Chamædrys*; Island of Cumbrae; August, 1914.

NEW TO BRITAIN.

- Morchella elata* Fr. var. *purpurascens* (Krombh.) Boud.
T. B. M. S., Vol. V., p. 255.—In sandy soil near
 Arrochar, Dumbartonshire; 15th April, 1915; Miss
 Connie Morris. Identified by Mr. Carleton Rea.
- Otidea concinna* (Pers.) f. *integra* Bres. *Ibid.*, p. 225; pl. IV.
 —On the ground bordering on woods near Eglinton
 Castle, Ayrshire; 28th August, 1915. Identified by Mr.
 Carleton Rea, who states that “this Discomycete is
 easily known by the bright lemon-yellow colour and the
 branched anastomosing ribs on the exterior of the cup
 and stem.”
- Cenangella ericæ* (Niessl.) Rehm. *Ibid.*, p. 238. — On dead
 leaves of *Calluna vulgaris*; near Beith, Ayrshire; May,
 1912.
- Anthostomella tomicoides* Sacc. *Ibid.*, p. 239.—On decaying
 stems of *Eupatorium cannabinum*; West Kilbride, Ayr-
 shire; June, 1914.
- Septoria ænanthis* Ell. and Ev. *Ibid.*, p. 245. — On fading
 leaves of *Ænanthe crocata*; Island of Cumbrae, and at
 Ardrossan; August, 1914. Also observed at West Kil-
 bride and Dundonald (Ayrshire), and Lochwinnoch
 (Renfrewshire).
- S. Brissaceana* Sacc. and Let. *Ibid.*, p. 246. — In spots on
 living leaves of *Lythrum Salicaria*; Stevenston, Ayrshire;
 July, 1913. Whiting Bay, Arran; August, 1913. Also
 at Martnaham Loch (parish of Coylton), Ayrshire;
 August, 1914.
- Glæosporium helicis* (Desm.) Oud. *Ibid.*, p. 247.—In dark-
 brown spots on leaves of *Hedera Helix*; Rosneath, Dum-
 bartonshire; June, 1912.
- Ramularia campanulæ-latifoliæ* Allesch. *Ibid.*, p. 242.—On
 spots on fading leaves of *Campanula latifolia*; Largs,
 Ayrshire; September, 1913.

R. cardui Karst. *Ibid.*, p. 242.—On decaying leaves of *Cnicus arvensis*; Dalry; August, 1913. Also on large discoloured spots on living leaves of that host at West Kilbride; August, 1915.

Hadrotrichum virescens Sacc. and Roum. *Ibid.*, p. 243.—On living leaves of *Agrostis*; Dalry; August, 1913.

NEW TO CLYDE AREA.

Phycomyces nitens Kunze.—Growing from a piece of dung buried in the soil in a flower-pot at Coatbridge (Mr. W. J. M'Leod). Identified by Mr. A. D. Cotton, F.L.S., Kew. This species is remarkable for its glistening brown hyphæ.

Puccinia cnici-oleracei Pers.—On *Cnicus palustris*, and less frequently on *C. lanceolatus*, at West Kilbride, Kilwinning, Beith, Whiting Bay (Arran), and Cumbrae; but apparently much less common than *P. cirsii* Lasch, which also occurs on the same host-plants. In the latter species, the sori of uredospores and teleutospores are scattered irregularly over the leaf-surface; while in *P. cnici-oleracei* uredospores are absent, and the sori of teleutospores are confluent in large circinate patches on the lower surface of pale or discoloured spots.

P. leontodontis Jacky.—On *Leontodon autumnale* at West Kilbride, Kilwinning, and Machrie Bay (Arran), in August and September. Probably common elsewhere, but apt to be overlooked.

Gyromitra esculenta Pers.—Numerous specimens occurred in April, 1915, amongst thin herbage on an old cinder-heap at a disused brick-work in the neighbourhood of Kilwinning. Identification confirmed by Mr. J. Ramsbottom, M.A., F.L.S.

Humaria macrocystis (Cooke) Mass.—This species was observed in Finlayston Woods, Renfrewshire, at an excursion of the Andersonian Naturalists' Society to that district on 3rd October, 1914. It grew at a place where wood had

been burned, and where the ashes still remained on the surface of the soil. Identification confirmed by Mr. Carleton Rea.

Diaporthe vepris (De Lacr.) Ntke.—On dead bramble-stems at West Kilbride; May, 1915.

Anthostomella ammophilæ Phil. and Plow.—On dead leaves of *Ammophila* at Fintry Bay, Cumbrae; June, 1915.

Lophiotrema sexnucleatum (Cooke) Sacc.—On dead stems of *Urtica dioica* at West Kilbride; 5th February, 1916.

Sphaerella typha Lasch.—On dead leaves of *Typha latifolia* at Lochlibo, Renfrewshire; October, 1912.

Labrella coryli (Rob.) Sacc.—Common in autumn on living leaves of *Corylus Avellana*, where it produces large withered spots, Fintry Bay, Cumbrae; 5th August, 1914; identified by Mr. Ramsbottom. Also observed at West Kilbride, Dalry, North Bute, &c.

Bird Notes from Possil Marsh.

JANUARY—JUNE, 1916.

By WILLIAM RENNIE.

[Read 27th June, 1916.]

HAVING for years now devoted the greater part of my spare time to the bird life of the Marsh, I venture to give a brief summary of the main movements that have taken place during the first half of the present year.

On many occasions the weather conditions are not the most congenial to the student of field ornithology, but such are just the days he should be abroad, for at these times one never knows what new bird or old acquaintance is likely to put in an appearance. Don't wait till the sun is high in the heavens and then take a hurried scamper around, but go in the earlier part of the day and stay for some time.

Much as many of us appreciate the return of our summer visitors to our midst, how few, alas, take the trouble to study a little closer the welcome our uncongenial climate extends to our feathered visitors from lands across the sea.

When our summer birds begin to arrive, the presence of the observer at the Marsh every evening, from the end of March till the first week of May, for at least an hour before sunset till dusk, and a number of early morning visits are most essential. Full advantage must also be taken of the week-ends. In that way one gets the true date of the migrants' first appearance, and a fair idea of their numerical strength, and at the same time forms a closer acquaintance with their habits, songs, &c., than any book can convey.

I think it only right that I should take this opportunity of thanking those who have given me the benefit of their assistance. Thanks are specially due to Mr. Hill.

In January there was an average of eight Mute Swans, and also a black one that had come about the middle of the previous month. This latter must not be confused with the now famous bird frequenting the Clyde above the Broomielaw.

A Cygnet, one of the Kenmure brood, was found dead on the 15th, whether from natural causes or otherwise I can't say. A pair of Tufted Ducks appeared on the 9th, while the Song-Thrush was heard singing on same date. The presence of fourteen Jackdaws on the 16th is rather out of the usual run here. The Reed-Bunting and Skylark were in song on the 30th.

During the month the Meadow-Pipit was occasionally noted. A few Siskins were lamed. The Siskin is a very rare visitor here. Two or three had also been taken during the previous month, at the marsh and elsewhere in the locality, a most regrettable action! Small birds such as Wren, Blue and Cole Tits, and Lesser Redpolls, were fairly common during the early part of the year. The Linnet was also observed. The Kestrel was seen several times, and the Sparrow-Hawk twice. Redwings and Fieldfares were always with us, and many returned here nightly to roost. Their

numbers were fairly steady till the middle of March, when a decrease became noticeable. This winter a greater number of Starlings passed the nights amongst the reeds and willows than had done so for some time back.

February weather may be said to have given us a sprinkling of everything. Whatever the cause may be, it certainly was not that of mildness that induced the Coots to return in the first week, a fortnight before their usual, when six were seen or heard. A pair of Little Grebes and three Tufted Ducks (2 ♀, 1 ♂) appeared on the 6th, a day that will be remembered for the severity of its hail, thunder, and lightning. The Coots disappeared as suddenly as they had come, and it was the end of the month before they were again seen. A Grey Wagtail was noted on the 5th. I have always classed this species as very rare here, although it can be seen almost any day about the ditch on the other side of the canal. On the 13th some eighty or ninety Gulls were to be seen going between the ploughed field and the water. They were in various stages of plumage. They were chiefly Herring-Gulls, although I saw a few of the Common and Black-headed. It is not usual to see so many here. The Blackbird was heard singing on 24th. A male Goldfinch and a Water-Rail were seen on the 27th, and the Black-headed Gull in nuptial plumage was observed. The Rook was observed frequently after the second week till the beginning of May. The Swans varied from eight to sixteen. The black one left towards the end of the month. Corn Buntings were always present, sometimes in fair numbers. Skylarks disbanded about the third week, and quite a number of Meadow-Pipits were observed in the last week.

March, like the previous month, gave a varied selection of weather conditions, which produced much liveliness amongst the bird life. Apart from the 12th there was an average of twenty Swans, but on that date there were thirty-one, including fifteen Bewick's Swans, which were only present for one day. The Mute Swans, having selected their site, began building towards the end of the month. This is the first occasion I have known them to do so whilst any of the visitors remained

about. The Black Swan returned on the 27th after having been away about a month. On the morning of the 12th a fine Blackcock was found sheltering amongst the willows. This is an addition to the list of Possil Marsh birds, and I have since learned that one had been shot here two or three years ago. The spring call of the Lapwing was first heard on the 12th, and during the week the return of the waders became general. The Snipe was heard drumming on the 19th. The wintry week-end of 26th was of great interest, for that was a morning of Ducks, the like of which has not been seen for years. I had counted twenty-two Tufted Ducks, when some fifty to sixty Ducks took wing northwards, leaving several of the species named behind, and some Mallard, Wigeon, and Teal, on the water or among the reeds. That morning over a score of Song-Thrushes were seen taking shelter wherever they could find it. The Lesser Black-backed Gull was seen on 22nd, and Wheatear on 28th. This year, so far, the presence of the Wheatear at the Marsh has been almost a blank. At the end of the month Coot had increased to two dozen, and as many as ten Waterhens were seen. The small birds were fairly numerous and varied, and much song was heard.

On the 1st April there were twenty-two Swans. The numbers fluctuated a little, reaching a maximum of thirty on the 18th, after that they gradually dwindled away, and on the 30th only two of the visiting Swans remained, but were gone the following day. The nest was destroyed by the visitors. On the 4th I saw four or five pulling the building material asunder and scattering it broadcast. The Swans, having regained possession of their building site, the reconstruction of their nest was begun on the 10th. No attempt was made to sit, though they worked steadily for a week. A great amount of extra labour was caused to them by the presence of the visitors, who came in for a very rough and lively time. It was indeed interesting to watch the male bird in the last half of the month. At sunset he would clear the water and round the visitors up into the reeds at the northern end, then return again in all his glory to his lady-love. Sitting may

be said to have commenced on the 23rd. The Black Swan was not seen after the 5th.

Swallows were first observed on the 3rd, when three were seen about sunset. These evidently were a fraction of what had made a rush north that week-end, as they were reported from various places on the west coast. With the cold snap that was over the country for the following few days, migrants here became a blank. The first Swallow to reappear was seen on the 15th, and an occasional one or two were noted at various times till the evening of 28th, when a flock of a hundred appeared, and the following evening there came close on two hundred. Along with them were two or three Sand-Martins and eight House-Martins. On the 26th about a hundred Sand-Martins made their appearance, and on the following evening about a hundred and fifty. Small lots of Swallows and Sand-Martins were seen for two or three nights following, then everything was again back to normal. Having in previous years described their behaviour on arrival, interesting as the sight is it is unnecessary that I should again repeat it. The spring movement of Wagtails was first observed on the 4th, when one White Wagtail was identified. A few were seen at sunset up till the 14th, when there was evidently a rush, for I noticed more that evening than I had seen altogether since the 4th. I identified two as being White Wagtails. In all likelihood they are mixed flocks, for on the 17th I disturbed some amongst the reeds, and over a hundred rose, the greater number being White Wagtails. The Yellow Wagtail was first observed on the morning of 26th, and on the evening of 29th over fifty of these birds and some Pied and White Wagtails were observed amongst the reeds. As usual a pair of Yellow Wagtails is nesting in the adjoining field. On the 6th at least thirty Coots were seen on the water. Three Willow Wrens were heard on the 26th, and this species became very plentiful by the 29th. The Common Sandpiper was seen on forenoon of 26th. On the 30th two Sedge-Warblers, the Cornerake, and the Cuckoo, were noted. Duck were more plentiful this month than usual, including

Mallard, Teal, Pochard, and Wigeon. On the 27th three Tufted Ducks (2 ♂, 1 ♀) and a female Scaup Duck were observed. The Scaup is a true sea-duck, rarely seen on inland waters. The bird stayed for three days. On the third day I saw two Coots evidently resenting its presence, and acting in a rather unfriendly manner towards it. This species is a further addition to the list of Possil Marsh birds. The last large flock of Fieldfares and Redwings, chiefly Fieldfares, was on the evening of 7th, when over one hundred were present, and within the next ten days they were all but gone. Redwings were seen last on the 22nd. On the evening of 29th twenty-two Fieldfares were seen, these being the last for the season. A Heron was seen on the morning of 30th, and was the first noted for close on a year. The Water-Rail was very noisy at sunset during the last week. I estimated that, in addition to the Swan, there were nesting one Mallard, at least a dozen Coots, six Waterhens, two Redshanks, two Snipes, a Lapwing, and two Little Grebes, and in all probability the Water-Rail. The nests of a Robin, a Reed Bunting, and two Lapwings were known to have been lifted during the month.

During the opening days of May the arrival of the summer migrants that are to be met with at the marsh is completed. Their arrival relieves the strain on the anxious observer, and this being the month of song he feels well rewarded, for what to him has been time well spent, though perhaps at times none too comfortably. A pair of Whinchats and Swifts were seen on the 3rd, and a male Whitethroat on the 7th. I made a fairly careful search, and have come to the conclusion that the Whitethroat is not so plentiful this year as last. I have noticed such fluctuations in former years. The Sedge-Warblers were not slow, as in some years, in becoming numerically strong. They are certainly more numerous than last year, a fact that was very noticeable after the 7th. Even allowing for sitting birds, there was a slight falling off towards the end of the month. I had another grand opportunity on the 27th of confirming a statement I have made on several

occasions, namely, that the Sedge-Warblers are the liveliest birds at the Marsh in a thunderstorm. Three Terns were noted on the 27th. They had already been reported as having been seen on the morning of 24th. Tern visits are very uncertain. On 28th a pair of Redstarts were sporting amongst the willows, and on the C.V.E.P., Co.'s wires. They were there during all the time of my four hours' stay. Their presence at this time must be treated as one of rather exceptional occurrence, as all my former records were in the autumn. On the 27th three broods of Coots were noticed—broods of three, three, and five. In the closing days of the month young Meadow-Pipits and Buntings were observed being fed. On the 27th I came on a nest of the Meadow-Pipit with four broken eggs, containing well-developed chicks. These were evidently being greedily devoured by seven beetles (*Necrophorus mortuorum*), in addition to the many other small insects. Apart from the occurrence on the 26th March, the visits of Tufted Ducks this year have been more frequent than for two or three years back, though none stayed to nest. The Cuckoo was seen almost daily. May, as usual, is the busy month of the egg harrier. The nest of the Coot, Waterhen, &c., received a thinning during the first week, after which quite a number of the birds left. Two nests of the Water-Rail were also taken. An unsuccessful attempt was made on the Swan's nest. The small birds' nests also received a lot of attention. I think the Lapwing was successful in bringing off a brood at the beginning of the month. The Swan on her nest came in for a good deal of attention from the public, as the site was very conspicuous and fairly close at hand.

Apart from the appearance of young birds, June lacked the thrill of expectancy of the previous months. On the morning of the 11th I saw the Swans on the water accompanying three tiny Cygnets, the fruits of their labour, although the nest had contained four eggs. Of eight Swans on the canal, two attempted a landing on the Marsh, but were beaten off by the male. After that the female returned again to her nest with her brood, and remained there for at least the next four hours.

That same morning I saw a pair of Little Grebes with two chicks. I learned that two nests of this species had been found a few days previously. One nest had three eggs, but unfortunately one of the eggs got broken, and it contained a well-developed bird, so, in all likelihood, the brood on the water was from that nest. The fate of the other nest is unknown to me, but the birds are still on the water. There were also two Terns flying about. I learned that, during the previous fortnight, Terns had been seen regularly. Early in the morning of the 17th sixteen Swifts were flying about. These were evidently four family groups. A Cuckoo, being pursued by two Meadow-Pipits, was also noted. Young birds were not uncommon at the end of the month. There were other two broods of Coots of six and seven at the beginning of the month. The month closes with a diminution in the volume of song that made the earlier part of the season so delightful to the watcher.

Note.

Sphinctrina turbinata (Pers.) Fr.—A difference of opinion has existed as to the true nature of this species, which has been described by some authorities as a fungus, and by others as a lichen. For this reason, it appears not only to have been omitted from the list of lichens compiled for the Handbook of the Natural History of the Clyde Area, prepared in connection with the visit of the British Association to Glasgow in 1901, but also to have been excluded from the list of fungi compiled for that work.

S. turbinata occurs as a parasite on *Pertusaria communis*, a lichen commonly found encrusting the living trunks of ash and other trees. The former species is so minute as readily to escape notice, but with the aid of a lens its presence may be detected by the shining black apothecia, of a globose or turbinate shape, which are scattered over the surface of the *Pertusaria*. It is referred to as "common," both by Leighton in his Lichen-Flora, and by Dr. Stirton in his List of the Lichens of the West of Scotland. No precise details as to

localities for *S. turbinata* are indicated by Dr. Stirton; but Mr. G. F. Scott Elliott, M.A., B.Sc., F.L.S., has reported records for "Hamilton (Maughan in Edin. Herb.); Glasgow (Hennedy Collection); and Rosneath (Crombie)." To these must now be added West Kilbride, where specimens were recently obtained by the writer. These were afterwards submitted to Miss A. Lorrain Smith, F.L.S., London, who kindly identified them.—D. A. BOYD.

Excursion.

BARNCLUITH AND GORGE OF AVON, 21st August, 1915.—Mr. John Paterson, conductor.—The region visited on the afternoon of this date, in beautiful weather, has been the scene of quite a number of outings of the Society. Barncluith, which is situated on the steep left bank of the gorge of the Lanarkshire Avon, near Hamilton, has changed hands since our last visit, and a great effort has been successfully made to put its celebrated gardens into good order. As far as was noticed, however, reverence has been shown for the best features of these gardens, and the botanists present were gratified to observe that old established plants on the retaining walls supporting the terraces, &c., were still encouraged to grow where they have been familiar to successive generations of visitors. Among such plants may be mentioned the Yellow Corydalis (*Corydalis lutea*), the Snapdragon (*Antirrhinum majus*), the Ivyleaved Toadflax (*Linaria cymbalaria*), the Bladder Fern (*Cystopteris fragilis*), and the Hart's-tongue Fern (*Scolopendrium vulgare*). Extraordinary fasciation was noticed on the long flowering spikes of all the clumps of a *Veronica*, supposed to be *V. virginiana*, and it was very notable that this plant was a great attraction to bees. Those who were unprepared for it were greatly astonished at the magnificent effect produced by the fruiting of the scarlet-berried Elder (*Sambucus racemosus*), and other notable shrubs doing well included the Mexican Orange (*Choisya ternata*) and *Olearia macrodonta*. There formerly stood in these gardens a fairly large Walnut Tree (*Juglans*), but it was destroyed by a storm some years ago.

[CONTINUED.]

ERRATA.

64^a

- Page 83, line 23, for "*Puccinia leontodontis* Jac.," read "Jacky."
 ,, 83, ,, 25, ,, "(Cooke) Hass," read "Mass."
 ,, 83, ,, 26, ,, "*Diaporthe vepsio* (De Laer) Nthe," read "*vepris*
 Laer. Ntke."
 ,, 86, ,, 24, ,, "D. & S." read "A. & S."
 ,, 86, ,, 24, ,, "*Clytocibe flaccidus*" read "*Clitocybe flaccida*."
 ,, 86, ,, 25, ,, "*Naucaria*" read "*Naucoria*."
 ,, 86, ,, 28, ,, "*Sparassio*" read "*Sparassis*."
 ,, 87, ,, 8, ,, "*Berniela*" read "*Berniela*."
 ,, 101, ,, 2, ,, "*N. junctifolia*" read "*N. juncifolia*."
 ,, 102, ,, 29, ,, "*Ledaii*" read "*Leedsii*."
 ,, 103, ,, 12, ,, "*pseudo-narcissus*" read "*Pseudo-narcissus*."
 ,, 103, ,, 12, ,, "*teleamonius*" read "*Telamonius*."
 ,, 105, ,, 7, ,, "*Aubretia*" read "*Aubrietia*."
 ,, 105, ,, 35, ,, "*Menziesi*" read "*Menziesii*."
 ,, 109, ,, 23, ,, "Var, *Prenula*" read "var., *Primula*."
 ,, 111, ,, 10, ,, "*Aram*" read "*Arum*."



The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII., No. 3.]

[September, 1919.

EDITORIAL NOTE.

THE long gap occurring between the issue of the last Part of *The Glasgow Naturalist* (November, 1916) and the present is due solely to the War. Various circumstances conspired to make it expedient to suspend publication till the cessation of hostilities. Since then a change of Editors has taken place. The new Editor (Rev. G. A. Frank Knight, M.A., F.R.S.E., 5 Granby Terrace, Hillhead, Glasgow) hopes that after this the issue of the Journal will be maintained with regularity.

The Glasgow Naturalist, Vol. VIII., p. 42, substitute the following for first paragraph:—

THIS unusual visitor was caught alive by Mr. Robert Kennedy, Beith, on the 4th December, 1915, at the disused limestone quarry, near Roughwood, Beith; its method of capture being very similar to the account of Blackwall, as given in Yarrell's *British Birds* (vol. 1, 3rd ed.).

Notes on Plants from Banff and from Old Kilpatrick, and on the Oaks in Erskine Policies.

By LAURENCE WATT.

[Read 28th March, 1916.]

I HAVE pleasure in submitting the following Notes on some Plants from Banff and from Old Kilpatrick, and some remarks on the Oaks from Erskine Policies.

Rubus spectabilis, Pursh.—Loudon, in his *Hortus Britannicus*, page 630, calls it the "Showy Bramble," and states that it is a native of British Columbia, and was introduced into this country in 1826. It is well named the

“ Showy Bramble.” Few persons, when for the first time they saw the beautiful crimson flowers appearing before the leaves, would ever think it was a *Rubus*. It flowers at the end of April and the beginning of May. The fruit is quite yellow and ripe about the middle of July. Loudon says: “ The drupe is red ”; but I have only seen it yellow. It grows quickly, and forms hedges from seven to nine feet high along the walks. It has been established here for a long number of years. A curious point about the Rubi is that, belonging as they do to the Rosaceæ, one would naturally suppose that the fruit would soon be picked off. Yet, though they hang so temptingly on the bushes, no one touches them.

Rubus nutkanus, Mocino.—This Bramble is named from the island of Nootka, which protects the entrance to Nootka Sound, British Columbia. Loudon, in his *Hortus Britannicus*, says it was introduced into this country in 1826, and gives North America for its habitat. This *Rubus* is more like our own, as the flowers and fruit are obtainable at the same time, though, perhaps, on different bushes. The flowers are white, and large in comparison with any of ours. The leaves are also large, and the five-pointed serrated root leaves are very handsome. This *Rubus* grows straight up from the root about three feet high. For the size of the flowers the fruit is very small. The drupes are red and very hairy, pretty to look at, but not at all tempting to taste. They were growing among *Petasites ovatus*, Hill. The *Rubus* would thus be easily overlooked among the large leaves of the Butter bur. It seems strange that these two Brambles from nearly the same locality in North America should be so well established in the grounds of Duff House at Banff.

Linnaea borealis, Linn.—In the *Trans. of the Edinburgh Microscop. Soc.*, Vol. V., 1902-07, page 84, there is a fine photograph of these plants taken *in situ*. Though the scene is Roxburgh, it very well represents the locality where I gathered it in Montcoffer Woods, Banff. This little northern bellflower, the plant that Linnæus himself selected to transmit his name to posterity, is a native of Lapland,

Arctic Asia, and North America, and is recorded from sixteen different counties in Britain. The stems run along the surface of the ground, throwing up the slender stalks on which the two small drooping bell flowers grow. The leaves are small, ovate, rarely obovate. The plant has never been known to fruit in this country, and Hooker, in the Third Edition of his *Flora*, acknowledges that his description of the fruit is derived from Wahlenberg's *Flora*. The various Floras mention that the flowers are pink and sweet-scented. I have failed to detect the sweet scent from any of them.

Linaria minor, Desf.—I exhibited this plant a number of years ago, from the railway track at Dalmuir, but the specimens were only two or three inches high. I was surprised, therefore, when I saw the size the plants had attained at Old Kilpatrick, where they grew, not on the railway track itself, but on the soft bank, where the roots had plenty of room. It shows, therefore, that they grow well among the cinder heaps of a railway bank.

Quercus Robur, Linn.—It is not often that one gets the opportunity of gathering *Q. Robur*, Linn., and *Q. sessiliflora*, Salisb., from the same locality, and with only a short distance between them, yet we gathered them in the Erskine policies on 2nd October, 1915. During the past century much has been written on the disputed point whether they are distinct species, or whether *Q. sessiliflora* is only a variety. The object of the present paper is to show that they are quite distinct and should be placed as separate species. Sir W. Hooker, in his *Flora* of 1830, thus describes them: "1. *Q. Robur*, Linn. (common British Oak), leaves deciduous, shortly stalked, oblongo-obovate, deeply sinuate, lobes obtuse; fruits, two or three on a long peduncle—*Engl. Bot.*, t. 1342; Hooker, *Scot. Engl. Fl.*—*Q. pedunculata*, Willd., and foreign authors."

The uses of this most important of trees are well known. Its acorns were formerly the food of our British ancestors, but are now left to hogs, squirrels, and birds. The word *Robur* is derived from *rore*, another Celtic word for the Oak, whence arises the word *robur*, strength.

“ 2. *Q. sessiliflora*, Salisb. (Sessile-fruited Oak), leaves deciduous on long stalks, oblongo-obovate, deeply sinuate; fruits clustered upon a very short stalk, or sessile,” and refers to *Eng. Bot.*, Hooker *Scot. Eng. Fl.*—*Q. Robur*, Willd., and most of the continental authors. The specific name is calculated to mislead. The flowers are sessile in both species, but here the catkin or spike is almost or quite sessile; in *Q. Robur* it is on a long peduncle. The wood of the present species was said to be much inferior to the last, and in the days when “ wooden walls ” were our defence, no little alarm was in consequence excited lest our forests should be thereby deteriorated. Yet, on the other hand, an eminent modern author has lately expressed his opinion that it is the *Q. sessiliflora* which yields the best timber for shipping. It is a subject that deserves the most serious consideration of the planter.

Babington, in the Fifth Edition of his *Flora*, states: *Q. Robur*, Linn., leaves deciduous, stalked, obovate, oblong, sinuate, lobes blunt.

- A. *Q. pedunculata* (Ehrh.). — Young branches glabrous, petioles short, fr. catkins long stalked, fruit scattered.
- B. *Q. intermedia* (D. Don.). — Young branches glabrous, petioles short, L. stellate-downy beneath, fr. catkins, shortly stalked, fr. near together.
- Y. *Q. sessiliflora* (Salisb.). — Young branches downy, petioles long, L. glabrous beneath, fr. catkins subsessile, fr. near together.

He says of *Q. Robur* that the leaves are stalked—that, of course, is not the case. He adds, however: “ It is generally supposed by foresters that there are two species of Oak in Britain.” I have failed in learning how to distinguish them.

In the 3rd Edition of his *British Trees* (page 292), Mr. F. G. Heath, referring to *Q. Robur*, Linn., says that the word *robur* meaning strength, is applicable to oaks

in general, and that *Q. Robur* should be *Q. pedunculata*, as being the most distinctive. *Q. sessiliflora*, Salisb., he names the flat-leaved oak, and says it is a more beautiful tree than *pedunculata*. The leaves are larger and brighter, more regularly lobed, more vivid in colour, and more glossy—there is more grace in their venation, the veinlets branching from both sides of the midrib proceeding in straight lines and with more regularity than in the case of *Q. pedunculata*. This is a good description of the leaf, though I cannot see so much difference in the veining.

In his paper on *British Oaks*, Mr. C. E. Moss, B.Sc., Editor of the *Cambridge Flora (Journal of Botany*, January and February, 1910), treats of oaks in general; but I give the summary of his opinion on the grounds on which *Q. Robur* and *Q. sessiliflora* should be regarded as distinct species. *Q. Robur*, in its reflexed leaf auricles, possesses a positive character which is almost unique in the genus. In the absence of multiple hairs *Q. Robur* is also exceptional, as such hairs are present on the great majority of oaks. These and other characters come true from seed. Lastly, he says the habitat of *Q. Robur* and *Q. sessiliflora* are entirely different, and in many districts mutually exclusive. It, therefore, seems unreasonable to unite the two trees under one specific name.

The greatest difference I can see is in the leaves—the one being sessile the other stalked; and the same is the case with the fruit. It is, however, strange that *Q. Robur* has sessile leaves and stalked fruit; while *Q. sessiliflora* has stalked leaves and sessile fruit. Far fewer differences between other plants have put them into separate species, and the differences observable in those two trees will confirm the view that they should be named *Q. Robur*, Linn., and *Q. sessiliflora*, Salisb., as being the oldest names for the two.

Quercus cerris, Linn.—The Turkey Bitter or Mossy-cupped Oak. According to Loudon, it was introduced into this country in 1735, and it has now got established in many districts, principally in private grounds. There are a few

fine trees in the Erskine Policies (see the measurements given by Mr. Renwick, Vo. VII., p. 89). It flowers along with the other Oaks in May and June. The leaves are longer and narrower than ours, and the sinuses are open. The acorns are ripe in October, though it is sometimes the following year before they ripen. In Erskine I have never seen them on the trees in winter. The mossy fringe with which the acorns are surrounded is quite a distinctive character. In a fine season the acorns grow to three times the size of those now shown. The bark is smooth when young, but becomes corky as it grows old, and those at Erskine have a fine corky appearance. Loudon says it is a fast growing tree, but that it does not live so long as our native Oaks. After sixty years growth it begins to deteriorate.

Quercus Lucombeana, Sweet.—The Ever-green Oak. It is also called the “ Devonshire Oak ” and the “ Exeter Oak,” because it was raised by Mr. John Lucombe, a nurseryman of Exeter, from seeds sown about the year 1762. According to Loudon it is a rapid grower, and has been propagated extensively in Devon, Cornwall, and Somerset. This species is considered to be a cross between *Quercus cerris* and *Quercus Suber*, the Cork Oak. The acorns, though small, are surrounded by a small mossy fringe like *Q. cerris*. The curious thing about this tree is that, in May or June, the fresh leaves come out along with the flowers, and the old leaves, still green and fresh, are entirely and simultaneously cast off, so that the tree appears bare; yet, so rapid is the change, that in a few days it is clothed anew in full verdure.

Some Clydesdale Sphagna.

By JOHN R. LEE.

[Read 27th June, 1916.]

Sphagnum acutifolium, Ehrh., var. *rubellum*, Russ.—A common and very variable plant, distinguished by its soft and slender habit, the stem leaves lingulate in form and generally copiously fibrillose, and the leaves of the spreading branches oval or very shortly pointed, and with large strongly-ringed pores on the dorsal surface.

From two localities in Dumbartonshire (v.c. 99)—Cruach Tarbet (Arrochar) and Auchingaich Corrie, Glen Fruin. Not recorded in the "Census Catalogue," from v.c. 99.

Sphagnum acutifolium, Ehrh., var. *gracile*, Russ.—A very distinct form, much resembling var. *rubellum*, but not soft nor flaccid, and easily recognised by the extremely minute pores on the apical part of the dorsal surface of the lower leaves of spreading branches.

Apparently uncommon, and not hitherto recorded for any Clydesdale locality. Found growing at the edge of the moor in Auchingaich Corrie (Glen Fruin), v.c. 99.

Sphagnum acutifolium, Ehrh., var. *fuscum*, Schp.—Easily known by the brown wood-cylinder of the stem and the usually brown colour of the tufts. Probably frequent, but not recorded.

Specimen from Allt. Sugach, v.c. 98.

Sphagnum acutifolium, Ehrh., var. *quinquefarium*, Lindb.—A very well-marked form, with the branch leaves distinctly arranged in five rows, giving the branches a five-angled

appearance under the lens. Stem leaves more or less distinctly deltoid-triangular, wood cylinder greenish-yellow.

From Tinto, Lanarkshire, v.c. 77. No record for this vice-county in the "Census Catalogue."

Sphagnum Girgensohnii, Russ. — Differs from *S. acutifolium* in the entire absence of the red colour which is characteristic of that species, and in the truncated stem leaves with fimbriate apex.

Much more restricted in range than *S. acutifolium*. Collected in various parts of Clydesdale—Tinto, Inversnaid, and Cairn table (the last by the late Jas. Murray).

The Deceptiveness of Adult External Features as Guides to Relationship, as illustrated by Decapod Crustacea.

By L. P. W. RENOUF

(Bute Laboratory and Museum, Rothesay).

[Read 27th June, 1916.]

DURING the first years of my biological studies I gathered a considerable collection of specimens, belonging not to any particular group but to each and every group, with the idea of getting together series illustrative of the theory of Evolution, which would be useful when discussing this subject with unbelievers. One of these series acquired special interest for two reasons:—(1) because by its means more than one sceptic was brought over to a belief in the evolutionary hypothesis; and (2) because, when I had occasion to go into it more deeply and to study its larval forms and its palæontology, I found that it was not a natural series at all.

The series in question was made up of a small number of British Decapod Crustacea, and, as the classifications of this

group given in most books are based on the old classification, which was mainly responsible for one's deception, it is possible that a few words on the subject may be of interest.

As a full and adequate treatment of the subject would take up far too much time, and would introduce an undue amount both of technical and of controversial matter, I propose to describe the series which has proved of so much interest to myself, and to indicate very briefly the grounds on which I fell out with the more generally accepted classification of the Decapoda, and came to conclusions which I afterwards found had been worked out thoroughly by Borrodaile of Cambridge, whose classification I thereupon accepted.

Briefly, the Crustacea Decapoda are characterised by the possession of a carapace which covers the whole of the head and thorax, of uniramous thoracic appendages—4-8 "pereiopods," as they are called, of three serial rows of thoracic gills enclosed in special branchial chambers formed by the lateral extension of the carapace, and of less obvious features. According to the older classification, "the Decapoda fall into three sub-orders, which graduate into one another—(1) the *Macrura*, including the Lobsters, Crayfishes, Shrimps, and Prawns; (2) the *Anomura*, including the Hermit-Lobsters and Hermit-Crabs; and (3) the *Brachyura*, or true Crabs." *

The *Macrura* are characterised by the large abdomen, carrying five pairs of biramous pleopods, or swimming appendages, and ending in a powerful tail-fin, composed of the telson and the greatly expanded sixth pair of pleopods, the whole apparatus being locomotory.

The *Anomura* are characterised by a variously reduced and modified abdomen, often carried flexed towards the thorax, and with the sixth pair of pleopods moderately well developed, but rarely functioning as a really powerful locomotory organ, and by having the last one or two pairs of thoracic appendages reduced.

* *Cambridge Natural History*, Vol. IV., page 153.

The *Brachyura* are characterised by the very much reduced abdomen, which is permanently flexed under the thorax, and carries but two pairs of pleopods in the male, four pairs in the female—the sixth pair always being wanting.

The series arranged was composed of forms apparently passing gradually from purely swimming to purely walking and on to partially swimming forms, and contained the following species:—*Palaemon*, *Crangon*, *Nephrops Galathea*, *Porcellana*, *Dromia*, *Cancer*, *Carcinas*, and *Portunus*. So plausible at first sight is this series, that I have taken the liberty of bringing down specimens of which it was composed (with the exception of *Dromia*, of which I have no specimen at present, and of *Nephrops*, instead of which *Astacus* has been substituted as being more portable).

In *Palaemon* the body is so compressed that the animal falls on to its side if stranded; the abdomen, with large pleopods, is a powerful locomotor organ, and much larger than the thorax with its weak appendages. In *Crangon* the body is somewhat broader, the animal not falling over sideways when stranded, and the thorax is a little larger in proportion to the abdomen. In *Astacus* (*Nephrops*) the thorax and abdomen are much more equal in size, the pleopods are comparatively small, with the exception of the sixth pair, which with the telson forms a large tail-fin, and the thoracic appendages have become powerful walking legs. The animal can both swim by means of its abdomen and crawl by means of its pereiopods. In *Galathea* the whole animal has become flattened, and the thorax very nearly approaches the abdomen in size. Ordinarily the animal crawls on four pairs of pereiopods, the last pair being reduced, and the telson may be flexed temporarily under the thorax or may be used to jerk the animal backwards. In *Porcellana* matters have proceeded still further, and the animal has the general appearance of a true Crab; but the last pair of thoracic appendages is reduced, and the abdomen can still be used in backward jerks.

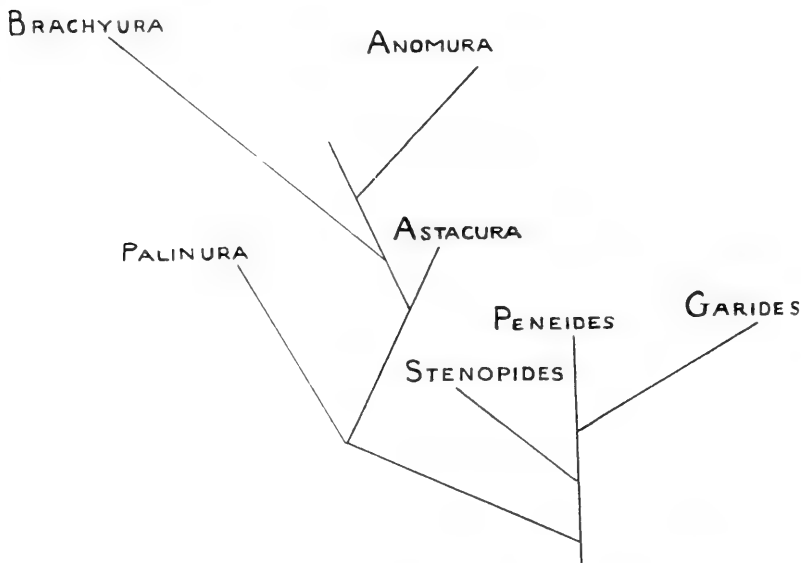
Dromia appears to link up the *Anomura* and *Brachyura* completely, for though its abdomen is very much reduced and permanently flexed under the thorax, which is greatly broadened, its last two pairs of thoracic appendages are much reduced and chelate, as are those of the Pagurid Anomurans, and there is a common orbital-antennary fossa. *Cancer* may be taken as a typical Crab, with its greatly reduced abdomen permanently flexed under its greatly enlarged thorax, and with five pairs of ambulatory thoracic appendages, all power of swimming being lost. The power of swimming has been regained, to some extent, by the members of the family *Portunidae*, not by the re-assumption of Macruran characters, but by the modification of the last pair of thoracic appendages into flattened paddles, fringed with long hairs, which serve to increase their surface on the down stroke.

Of course, no one would ever dream of maintaining that this series forms a direct route from *Palaemon* to *Cancer*; but it does lend very considerable support to the statement that the *Macrura*, *Anomura*, and *Brachyura* graduate into one another, the *Anomura* being intermediate between the two other groups, until, with a little probing, we see that the relationships between the members of these groups are not along a straight line, but along trunks, branches, and twigs—a fact which necessitates remodelling of the classification.

In Borrodaile's classification* the older *Macrura* are split into two groups, of which one, including the *Stenopides*, *Penaeides*, and *Carides*, *i.e.*, all the truly swimming forms, is called the NATANTIA, and is contrasted with the REPTANTIA, comprising the *Palinura*, *Astacura*, *Anomura*, and *Brachyura*. Of these, the first two groups contain the rest of the old *Macrura*, the second two the remainder of the Decapoda as of yore, but are considered as diverging from a common stock, not as proceeding from each other.

*L. A. Borrodaile, *Ann. and Mag. of Nat. History*, Ser. 7, Vol. XIX., 1907, pp. 457-486, which also gives other references.

The relationships of the various groups may be shown diagrammatically :—



Though this classification is based largely on external features, it receives support also from the study of development. Thus the *Natantia* practically all pass through larval protozoa, zoea, and mysis stages, some of them through nauplius and metanauplius stages as well; the thoracic limbs, when first formed, are biramous; and segmentation and limb development are orderly, with the exception of the last pair of pleopods, which develop precociously. In the *Reptantia*, on the other hand, the zoea is the first larval stage—at least some of the pereiopods are uniramous at the beginning, and the abdominal segments and appendages all tend to be precociously developed before those of the thorax.

The *Palinura* and *Astacura* both hatch out as mysis larvæ, which gradually assume the adult form. The larva of the *Palinura* is in the flattened phyllosoma form, and on this and other grounds the two groups are considered as divergent branches of a common stock.

All the *Anomura* and *Brachyura* hatch out as zoeæ; but of the *Anomura* some become adult after passing through a mysis stage (*Thalassinidea*), others after becoming metazoeæ (*Galatheidea*), and others only after a further stage—the glaucothœ — corresponding to the adult of the former (*Paguridea*); whilst of the *Brachyura* the majority pass through metazoea and megalopa stages to the adult, the megalopa corresponding to the glaucothœ of the *Anomura*. In the *Dromiacea*, however, the zoea recalls the mysis of the *Astacura*.

From the geological evidence the *Brachyura* seem to be older than the *Anomura*, but it is probable that here again we have divergent branches from a common stock. That this stock came from the main astacuran branch is vouched for both by the nephropsidean larva of the *Dromiacea* and by Jurassic Nephropsidea, which very closely resemble existing *Dromiacea* of the genus *Homolodromia*.

David Gregorson—A Memorial Notice.

By JOHN RENWICK.

[Read 27th June, 1916.]

DAVID GREGORSON joined this Society in 1879, being one of the members of the Glasgow Society of Field Naturalists which then became amalgamated with it. The Field Naturalist Society was established in 1871. Mr. Gregorson was Secretary for session 1872-73, but resigned office in November, 1873, on leaving the city for Kilsyth. He was a frequent exhibitor, and read seven papers between April, 1873, and May, 1876.

To this Society also he often exhibited specimens, and contributed five papers. The first, read on 31st August, 1880, was

upon "Arran," dealing mainly with the botany and geology of the coast from Whiting Bay to Dippen, and giving a list of plants found on the island of Pladda. In case anyone should wish to refer to this list in an unbound copy of the *Transactions*, it may be mentioned that the sheet containing the *Proceedings* of the summer session, 1880, was accidentally omitted from Part I, Vol. V, and appeared at end of Part II, Vol. V (First Series).

His other papers were:—

"Geographical Distribution of Plants" (14/6/81).

"Ben Ghnuis (Arran), Geology, Flora, Fauna" (15/8/82).

"On Sea-Weeds" (27/2/83).

"Notes on the Algæ of the Kildonan Shore, Arran." —*Trans.*, Vol. I (N.S.), pp. 170-173, where a list of Algæ seen or collected is given (24/2/85).

His last exhibit was apparently made on 16th August, 1887. He went to California in 1888, residing first at Riverside, but after 1896 at Santa Barbara.

Mr. Gregorson belonged to Stewarton, in Ayrshire. He was trained as a teacher, and taught for some time in Greenock, where his wife had also been a teacher. After the institution of School Boards, he was appointed to Kilsyth Public School in 1873. Three of his papers treat of the Natural History of that district.

In the United States he was appointed an Inspector of Orchards, and engaged in teaching, first privately, and, later, in a public school.

From a few of his letters some extracts may be of interest. In October, 1890, he writes: "There are so few deciduous trees, we never see the usual signs of autumn." "A Eucalyptus tree was measured some time ago in this locality. It was planted in the form of a seed just eighteen years ago next month, in November, 1872, by my cousin. It is now a tree 150 feet high, and 11 feet 4 inches in circumference 4 feet from the ground. Sunshine does make things grow."

The average annual rates of increase were thus $7\frac{1}{2}$ inches girth, 8 feet 4 inches height.

These figures seem almost incredible; but Dr. A. Henry, in "Trees of Great Britain and Ireland," states that a Blue Gum tree at Malaga attained a height of 65 feet in six years, an average of $10\frac{1}{2}$ feet a year. He quotes from M'Clatchie (1902), that in California "trees about 30 years old have attained 150 feet in height and 3 to 6 feet in diameter," and that "there are many instances of blue gums attaining 50 to 75 feet in from five to ten years; and adds that it is without doubt the fastest growing tree in the world." So, doubtless, Mr. Gregorson's tree was a *Eucalyptus globulus*, and his figures quite credible.

In the same letter he writes: "Some of the orchardists who have scale on their trees are busy spraying at this season. The apparatus is . . . a pump that works by compressed air, and rubber hose, and nozzles of various kinds. The material is composed of 1 lb. pearl ash, 2 lb. rosin, dissolved in one gallon of water, then diluted with from 6 to 20 parts of water, as it is wanted stronger or weaker. This solution has been adopted by my recommendation. . . . As far as known yet, the result is very satisfactory. We are getting a fumigation apparatus made, it is said, to do more thorough work than spraying."

In January, 1891, he writes: "I have been kept busy at my work of Inspection. We found red scale spreading, so had to be more diligent in finding it. And now Riverside has got a fumigating apparatus, or rather three of them, for killing the scale by means of hydrocyanic gas. The apparatus consists of a strong wagon with a tall mast fixed to it. This mast is rigged out with a cross spar. At each end of the spar a large tent is fixed. The tent is twisted by means of ropes and let down over a tree and filled with gas and allowed to remain 20 or 30 minutes, and by this means all the scale is killed."

"All the Inspectors of the county (between 20 and 30) meet at the end of the month, or sometimes once in two months,

to talk over the work and compare progress. The Riverside Inspectors (8) meet one evening every month to discuss business. When will a Scotch county pay men to look out for insect pests in their grain fields? ”

In July, 1892, he states that the red scale is *Aspidiotus aurantii* or *Aonidia aurantii*. “ It is the most injurious insect pest we have on the citrous trees. In some districts the orchards are almost rendered worthless by it. It gets over the leaves, fruit, and bark, and soon kills the tree branch by branch. In Riverside district it has done no damage on account of the careful inspection. Every orchard is looked over and every tree in the orchard, and whenever we find any of the scale we cut out the infected parts and burn them, then fumigate the trees on which they were found.”

He mentions a number of plants he has observed, a few of which may be noted :—“ There are a great number of cruciferae. The *Capsella Bursa-pastoris* grows very abundant in the orchard in winter, and is known as pepper-grass. . . . I see *Claytonia perfoliata*. There used to be a *Claytonia* at Gourcock. *Malva rotundifolia* is one of our commonest weeds. *Erodium cicutarium* is the grass of the plains in spring, covering immense areas and affording food for the sheep. The *Medicago sativa*, or Alfalfa, is our principal hay. . . . Grasses are not abundant. In some places Oats grow all over wild. Mosses are rare, so far as I have seen. Fungi are common, and in the rainy season we gather the common mushroom sometimes.”

In May, 1896, he writes : “ I have not yet seen any of these giant trees of this coast. I had a day out with a minister who is a lover of nature. He resided some time in the vicinity, where there were a few of these large trees. He says that the sight of them always made a peculiar impression on him; he felt as if he stood in the presence of a living being. He thinks they are the most majestic living things on earth.”

Mr. Gregorson died 3rd April, 1916, aged 80.

Robert J. Bennett—A Memorial Notice.

By JOHN RENWICK.

[Read 27th June, 1916.]

ROBERT J. BENNETT, who died on 25th May last, aged 74, joined the Society on 28th September, 1869, and was thus a member for the long period of nearly 47 years. (Only one member has been longer on the roll.) He was Treasurer for seven sessions—1876-77 to 1882-83—both inclusive.

An enthusiastic bee-keeper, he read to the Society eight papers on bees:—“On the Honey-Bee” (1876); “On Bees, the Origin, Treatment, and Cure of Foul Brood” (1877); then for six successive years “Apiarian Notes,” from 1877 to 1882. He was one of the moving spirits in getting up an Apiarian Society, which for a number of years had an exhibition at the Highland and Agricultural Society’s annual shows. At one time he had a large collection of butterflies.

In the report of the first of his “Apiarian Notes,” read 30th October, 1877, as given in the *Proceedings* of the Society, Vol. III, pp. 256-7, it is stated: “At the close of his paper, Mr. Bennett presented to the library of the Society a beautifully written letter he had received from Miss Clementina Stirling Graham, of Duntrune, the last representative of the Grahams of Claverhouse, written in bed, shortly before her death, in her ninety-sixth year. Miss Graham was probably the oldest bee-keeper known, having taken an interest in the culture of honey for three-quarters of a century, and this document, amongst the last of her correspondence, he thought worthy of preservation.”

Proceedings of the Society.

28th September, 1915.

The first meeting of the sixty-fifth session was held on this date, Mr. J. R. Jack, M.I.N.A., Vice-President, in the chair.

Reports on excursions to Killin (vol. viii., pp. 17-22), Fin Glen (p. 32), Barncluith and Gorge of Avon (pp. 64, 93), Waashill, and Barochan (pp. 11-17) were submitted.

Mr. Alex. Ross, F.E.I.S., exhibited *Matricaria discoidea* D.C., which he had discovered growing in Great Western Road. None of the local lists of plants mentions the species as found within our area. Mr. Wm. Rennie submitted a number of notes on the plant, with a list of places in and around Glasgow where it may be seen growing (see page 25). Mr. John Ritchie, jun., read a paper on "Notes on some Scottish Leeches" (vol. viii., pp. 8-11).

26th October, 1915.

The sixty-fourth Annual General Meeting was held on this date, Mr. W. R. Baxter, President, in the chair.

Mr. James Robson, 16 View Park Avenue, Dennistoun, was elected an ordinary member. The Hon. Secretary, Mr. Alex. Ross, submitted the Council's Annual Report. The losses by death included Miss Kidston, Stirling; Mr. H. Ballantyne; Prof. Gwynne-Vaughan; Mr. A. Park; and Mr. John Hunt.

The membership of the Society was reported as follows:—Honorary Members, 15; Corresponding Members, 30; Life Members, 21; Ordinary Members, 166—a total of 232. There are also 3 Associates.

Mr. James Mitchell, Hon. Librarian, reported on the Library; and Mr. John Paterson, Hon. Editor, reported on the Society's Publications. The Report of the Hon. Treasurer (Mr. John Renwick) was printed on the monthly circular (p. 112).

The following were elected to be office-bearers:—Vice-Presidents, Messrs. H. W. Wilson and R. Elmhirst, F.L.S.; as Members of Council, Messrs. R. Garry, B.Sc., James F. Gemmill, M.A., M.D., D.Sc., William Cousin, Arch. Shanks, and John Ritchie, jun. The Hon. Librarian and the Hon. Editor were re-appointed.

Mr. Jno. R. Lee exhibited specimens of *Sphagnum Austini*, Sull. from Aberfoyle, a first record for Vice-County 87. Some interesting notes on this rare moss were illustrated by microscopic preparation of this and two other commoner species, viz., *S. cymbifolium* (Ehrh.) and *S. papillosum* (Lindb.).

Mr. Chas. Kirk sent for exhibition a Scottish specimen of the Bee-eater, *Merops apiaster* Linn. (♀ Lerwick, 14th July, 1915), and Mr. John Paterson gave some interesting notes on this beautifully-plumaged Mediterranean species.

Mr. Frank M'Culloch sent for exhibition an Iceland Gull, *Larus leucopterus*, Faber, from Loch Fyne, and Mr. D. Macdonald contributed observations on this species which he had made in Mull.

Mr. D. A. Boyd submitted a paper entitled "Notes on the Microfungi of the Kyles of Bute District" (vol. viii., pp. 1-8). In an additional paper, Mr. Boyd gave the following as new records for the Clyde area:—*Puccinia leontodontis* Jac., West Kilbride and Machrie Bay, Arran; *Gyromitra esculenta* Pers., Kilwinning; *Humaria macrocystis* (Cooke) Hass, Finlayston Woods, Renfrewshire; and *Diaporthe vepsio* (De Laer) Nthe, West Kilbride.

Mrs. Peter Ewing gave an interesting report on the British Association meeting held at Manchester, which she had attended as the Society's representative.

30th November, 1915.

The third meeting of the sixty-fifth session was held on this date, Mr. W. R. Baxter, President, in the chair.

The following new members were elected:—Mr. L. P. W. Renouf, Bute Laboratory and Museum, Rothesay; Mr. James

Bain, 752 Yoker Road, Yoker; Mr. William Bain, 55 Kelvinside Street; and Mr. William Young, Thomson Place, Milton of Campsie.

The following alterations in the Constitution of the Society were moved by Mr. James Mitchell, on behalf of the Council, and were unanimously agreed to:—

1. Chap. VIII. (1)—“ That the business of the Society shall be managed by a Council of twenty-three, consisting of a President, three Vice-Presidents, twelve Councillors, two Secretaries, a Treasurer, a Librarian, an *Assistant Librarian*, an Editor of Transactions, and a *Lanternist*, who,” &c.

(2)—“ . . . but this regulation shall not apply to the Secretaries, Treasurer, *Librarians*, Editor of Transactions, nor *Lanternist*.”

2. That it be left to the Council to define the duties of the Assistant Librarian and the Lanternist.

Mr. Jas. J. F. X. King, F.E.S., exhibited specimens of *Formicoænus nitidula* Nyl. males, workers, and females, dealated and winged, not before recorded from Aberdeenshire. The winged females are new records for Scotland. This little ant inhabits the nests of other ants, and is known to occur in association with two of a common species, forming small colonies within the larger colonies. In the district from which the specimens came, Mr. King found them abundant, but the winged females were rare, the period during which the wings are retained being apparently very brief.

Mr. John Main, F.G.S., exhibited three varieties of Wasps' Nests, from the Clyde area and from the South of England, illustrating their structure by lantern slides. Mr. Main also gave a very interesting lecture on “ Farthest South in Old England—A Holiday in 1915.” illustrated by lantern slides. Some excellent views of the stone circles of Southern England were shown, and a number of slides of the Cornish coast were much admired.

28th December, 1915.

The fourth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. Wm. Davidson, 18 Lilybank Gardens, Hillhead, was elected an Ordinary Member, and Mr. Richard K. Somerville, 14 Southpark Terrace, Hillhead, an Associate Member.

Mr. Charles Kirk, by favour of Lieut.-Commander W. Ward Hunt, R.N., sent for exhibition an albino male variety of *Falco peregrinus* Tunst., the Peregrine Falcon, from South Portugal.

Mr. John Paterson exhibited a twig of the Australian Blue Gum Tree, *Eucalyptus globulus*, with foliage and flower-buds.

Mr. J. R. Jack, M.I.N.A., gave a lantern exhibit of a number of autochrome studies of excellent technique. The studies were principally rare Scottish Alpine plants *in situ*, and a number of fungus subjects were included.

Mr. John Paterson read a paper, "Notes on the Mistletoe (*Viscum album*), with a preliminary List of Host-plants." In dealing with the distribution of the plant, he pointed out that, as a native wild plant in Britain, it is confined to South-east Britain, a range similar to that of the nightingale. It has, however, been introduced into many parts of Scotland, and flourishes here as well as in England. Still, it does not grow wild with us, although the mistletoe thrush, the agent which distributes the seeds, is common throughout the South of Scotland. Some twenty Scottish districts where the plant is grown were indicated, and some interesting features in its biology and distribution were illustrated by a large list of the known hosts of the plants. The paper was further illustrated by a number of slides lent by Mr. John Main, F.G.S.

25th January, 1916.

The fifth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. R. B. Johnstone reported on the fungus forays for 1915 to Woodside (Beith) and Mains (Milngavie) (p. 94).

Mr. John Ritchie, jun., exhibited a female Great Grey Shrike (*Lanius excubitor* Linn.), which had been caught by Mr. Robert Kennedy near Beith, on 4th December, 1915. Mr. Ritchie gave some interesting notes on the specimen (see pp. 42-45), and Mr. John Paterson contributed data relating to thirty-seven specimens having been seen or secured between the years 1863 and 1900. The occurrences were well spread over the area, from Inveraray, Arran, and South Ayrshire, through Renfrew and Dumbarton, to Lanark beyond the falls of Clyde. They covered the period from November till May.

Mr. Ritchie further exhibited a Mite obtained within the bronchii of the Shrike shown, and also a specimen of *Leucochloridium macrostomum* Rud. from the intestine of the same bird, a Trematode parasite hitherto unrecorded for Britain. A full description of both parasites were given, and excellent microscopic preparations of them were shown.

Mr. John Main, F.G.S., sent for exhibition a large number of Gourds of various kinds, all of which had been grown in the hot-houses of the Botanic Gardens, Glasgow, between the years 1913-1915.

Mr. W. R. Baxter exhibited lantern slides of fifty photographs of Fungi *in situ* (second series). They were of excellent technique, and illustrated many very interesting specimens, notably:—*Armillaria robusta*, D. & S.; *Clytocybe flaccidus*, Sow.; *Naucaria tabacina*, DC; *Stropharia squamosa*, Fr.; *Panus conchatus*, Fr.; *Fomes nigricans*, Fr.; *Hydnum imbricatum*, Linn; *H. ferrugineum*, Fr.; and *Sparassio crispa*, Fr.

Mr. John Paterson communicated some notes on "Birds of the Beith District," based on the observations of Mr. John Craig. Four years ago a list of the Birds of this district was published in the Society's journal. There fall now to be added to the list the Nightjar, *Caprimulgus europæus* (Linn); the Great Crested Grebe, *Podiceps cristatus* (Linn.)—both of which have nested in the interval since the list was published; and the Ruff, *Machetes pugnax* (Linn.), nowadays a

bird of passage in this country. There were also submitted some exceptional circumstances which arose during the last mating season on the economy of the Stonechat (*Pratincola rubicola* (Linn.)), the Garden Warbler (*Sylvia hortensis* (Bechstein)), the Swallow (*Hirundo rustica* (Linn.)), the House Martin (*Chelidon urbica* (Linn.)), and the Chaffinch (*Fringilla coelebs* (Linn.)). It was also pointed out that the Canada Goose (*Berniela canadensis*) has apparently been extirpated from the Castle Semple Loch District.

29th February, 1916.

The sixth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Dr. Johnstone Macfie sent for exhibition a Weasel, *Mustela vulgaris*, Erxl., from Inverkip, shot on 8th December, 1915. The small size of the specimen, and the date when secured, induced Dr. Macfie to preserve it, on account of the bearing this might have on the question whether there are two varieties of the Common Weasel in this country. He called attention to the tail, which was rather longer and more tapering than is usually the case. Mr. Kirk stated that the specimen was an adult female. Mr. Hugh Boyd Watt, in a note on the specimen, pointed out that only one species of the animal is recognised as occurring in the British Isles. The females are smaller than the males, and in Scotland many country people believe there are two separate species—the big Brown Weasel, and one which they call the “ Mouse-killer ” or “ Cane.” Mr. Watt gave some notes on the word “ cane,” as applied to small Weasels (see p. 29). Mr. Charles Kirk sent a skin of a large Weasel for comparison with Dr. Macfie’s specimen. Mr. Arch. Shanks exhibited the skin of a Stoat (*Mustela erminea*, Linn.), showing the winter coloration of the fur.

Mr. Kirk also sent for exhibition a specimen from Tentsmuir (19th July, 1915) of a young Little Tern, *Sterna minuta*, Linn., a bird comparatively rare in Scotland. He

further showed a cream-coloured Song Thrush, *Turdus musicus*, Linn., from Eaglesham (26th September, 1915), by favour of Captain Gilmour.

A lantern exhibit of a large series of photographs of places of interest in the vicinity of Glasgow was sent by Mr. Christie. Mr. N. Reid exhibited a fine series of slides illustrative of the Clyde from its source to the Firth. Mr. J. G. Connell showed a large number of Ayrshire pictures, in particular some of the River Ayr, and also a series of valuable photographic studies of marine life. Mr. George Lunam exhibited a number of photographs taken in the Oban district.

28th March, 1916.

The seventh meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. Laurence Watt exhibited the following plants, along with full and interesting notes:—*Rubus spectabilis*, Pursh., and *R. nutkanus*, Mocino, both North American species, procured in the grounds of Duff House, Banff, where they are perfectly established; *Linnæa borealis*, Linn., from Montcoffer Woods, Banff; *Linaria minor*, Desf., from the railway bank at Old Kilpatrick; *Quercus Robur*, Linn. (= *Q. pedunculata*, Ehr.), *Q. sessiliflora*, Salisb., *Q. cerris*, Linn., and *Q. Lucombeana*, Sweet, all in fruit, from Erskine Policies (p. 65).

Mr. Charles Kirk sent for exhibition four Scaup Ducks, *Fuligula marila* (Linn.), showing three stages of male plumage, and one adult female, from Loch Ryan. He showed also a Great Grey Shrike, *Lanius excubitor*, Linn., from Row, Gareloch.

Mr. John Renwick submitted a paper, "Notes on *Quercus Lucombeana*, Sweet," in which was given a full account of the origin of the Lucombe Oak, and some of its varieties. The Lucombe Oak is undoubtedly a hybrid between *Q. cerris* and *Q. suber*; it was first raised from seed by Mr. Lucombe, of Exeter, about 1765.

Mr. Arch. Shanks read a paper of great general interest on "Temperatures of some Scottish Springs," in which he gave the thermic readings of the waters of springs in many localities, and at different times of the year.

24th April, 1916.

The eighth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. Paterson read a memorial notice of the late Mr. Johnstone Shearer, who had been a member of the Society for thirty years, and had done valuable work in the way of increasing our knowledge of topographical botany (see pp. 33-35).

A report of the excursion to Cochno and Edinbarnet was submitted (p. 95).

Mr. John Cairns exhibited and described a series of specimens of various species of *Eucalyptus* from Stonefield, Loch Fyne; Castle Kennedy, Wigtownshire; Bellfield, Kilmarnock; and the winter gardens at Springburn Park. The Stonefield trees are probably the finest in Scotland. *Eucalyptus urnigera*, Hooker f., on that estate had, in 1910, a girth of 5 feet at 4 feet from the ground, and had attained a height of 81 feet. The forester stated that it had never been injured by frost since it was planted out. It had been known erroneously as *E. gunnii*, Hooker f., and *E. coccoifera*, Hooker f. (pp. 37-41).

A paper, entitled "Notes on Birds observed in two side Valleys of the Rhone Basin—St. Luc in the Val d'Anniviers and Almagrel in the Saas Thal"—was contributed by Mr. George Guthrie. After a brief description of the physical features of the valleys, the paper gave interesting notes on the ornithology of the district. The species noted with certainty numbered thirty-one, a good total, considering that maritime species and waders were almost excluded. Nine

other species would require further observation before Mr. Guthrie would admit them to his list. Two general impressions, based on the observed facts, he gave as follows:—(1) in walking through a Swiss forest there is not, as there is in our home woods, a sense of the presence of the “choir invisible” of birds, which at any moment may break into song, even though subdued and wandering; and (2) the species, whether of birds or of plants, are proportionately more numerous than the individuals. The thirty-one species authenticated were the following:—Nutcracker, Swift, House-Sparrow, Swallow, House-Martin, Black Redstart, Great Tit, Long-tailed Tit, White Wagtail, Alpine Swift, Kestrel, Alpine Chough, Citril-finch, Coal Tit, Crested Tit, Wheatear, Serinfinch, Whinchat, Mistle Thrush, Chaffinch, Common Wren, Buzzard, Goldfinch, Redbreast, Sand-Martin, Dipper, Yellow Wagtail, Common Redstart, Hedge-Sparrow, Goldcrest, and Blackbird. The species still doubtful were as follows:—Pipit (*Anthus spinoletta*), Nuthatch, Crag-Martin, Carrion Crow, Tree-Pipit, Siberian Nutcracker, Bonelli’s Warbler, Black-headed Gull, and Common Tern.

Mr. John Cairns lectured on “The Bulb Fields of Holland,” with the aid of a fine series of slides. He traced the history of bulb growing from its inception to the present time, showed how the bulbs are propagated, and detailed the method of cultivation. The slides revealed how extensive and important an industry that of bulb rearing is in Holland.

30th May, 1916.

The ninth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. James Rourke, 4 Vinicombe Street, Hillhead, and Mr. P. C. Balfour, 175 West George Street, were elected Ordinary Members of the Society.

Mr. John R. Lee reported on the excursion to Arrochar (p. 98); Mr. James Whitton on that to Bellahouston Park Rock Gardens (p. 99); and Mr. John Cairns on the visit to Pollok House (p. 103).

Mr. James Dick, M.A., exhibited the following Anthomedusæ taken in the Firth of Clyde:—*Sarsia eximia* (Allman); *S. densa*, Hartl.; *Purena gemmifera* (Forb.); *Corymorpha nutans* (Sars.); *C. aurata* (Forbes); *Hybocodon prolifer* (L. Agassiz); *Lizzia blondina* (Forb.); *Bougainvillia britannica* (Forb.); *Podocoryne areolata*, Alder.; *P. carnea*, Sars.; *Rathkea blumenbachii* (Rathke.); *Lar sabellarum* (Gosse); *Leuckartiara octona* (Fleming). The structures were described, and blackboard illustrations were given.

Mr. John Sawers sent for exhibition a number of colour photographs of deep-sea and other Fishes; and Mr. Peter Macnair, F.R.S.E., F.G.S., gave an interesting description of them, dealing specially with some new British species.

Mr. Macnair also exhibited some Pearl Mussel and Plant Remains from the ancient course of the Clyde at Dalmarnock Bridge.

Mr. M'Lachlan exhibited a fine specimen of *Atticus atlas*, which had come from India as a chrysalis, and had emerged as an insect in the Botanic Gardens on 26th May, 1916.

Mr. Anderson Fergusson read a paper entitled "Some Records of Coleoptera from Cantyre, Vice-County No. 101" (pp. 46-52).

Mr. D. Macdonald read a paper, "On the Little Gull (*Larus minutus*, Pallas) and other Rare Birds near Glasgow" (pp. 35-37).

27th June, 1916.

The tenth meeting of the sixty-fifth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. John Renwick read memorial notices of the late David Gregorson (p. 77), and of the late Robert J. Bennett (p. 81).

Mr. Alex. Ross read a report on the excursion to the Orchard Country (p. 108), and on that to Nether Auchendrane (p. 110). Mr. R. Thompson reported on the visit to Springburn Park (p. 109).

Mr. John R. Lee exhibited and gave interesting notes on the following Clydesdale sphagna:—*Sphagnum rubellum*, Wils., from Auchingaich Corrie, Glen Fruin; *S. acutifolium*, Ehrd., var. *gracile*, Russ., from Auchingaich Corrie, not previously recorded for Clyde; do., var. *fuscum*, Schp., a new Vice-County record, from Allt Sugach, Arrochar; do., var. *quinquefarium*, Lindb., from Tinto, a new record for Vice-County 77; and *S. Girgensohnii*, Russ, from Inversnaid.

Mr. William Rennie, in a paper entitled "Bird Notes from Possil Marsh, January to June, 1916," gave a summary of the main movements that have taken place in the period (p. 56).

Mr. Louis P. W. Renouf read a paper on "The Deceptiveness of Adult External Features as Guides to Relationship, as illustrated by Decapod Crustacea." By exhibiting a small series of British Decapods, composed of forms apparently passing gradually from purely swimming to purely walking forms, and by referring to the developmental stages of these, it was shown that the older and seemingly natural classification requires modification (p. 72).

Mr. D. A. Boyd submitted a paper, read by Mr. Ross, entitled "Additional Records of Microfungi for the Clyde Area" (p. 52). Mr. Boyd also sent a short note on *Sphinctrina turbinata* (Pers.), Fr. (p. 63).

Excursions.

BARNCLUITH AND GORGE OF AVON, 21st August, 1915—(continued from p. 64).

Fortunately, a different fate has been meantime reserved for a handsome Robinia (*Robinia pseudacacia*), of which a plate appeared in the first volume of the *Annals of the Andersonian Naturalists' Society*. It is not remarkable for size as the species goes, but it is a typical, beautiful, and vigorous example of the Robinia, and is most advantageously placed on the margin of one of the terraces overlooking the Avon for being seen either from the level on which it is planted or from the terrace above. When measured by the writer on 15th September, 1888, its trunk was 5 feet 7 inches in circumference at a height of 4 feet 6 inches; on 12th September, 1891, it had increased to 5 feet 10½ inches at 4 feet 2 inches; while on the occasion of this visit it had increased to 7 feet 1¼ inches at 4 feet.

Sir Thos. Dick Lauder's edition of "Sir Uvedale Price on the Picturesque" has for frontispiece a representation of the gardens at Barncluith and their surroundings, and in that edition will be found some curious particulars relating to the formation of these notable gardens. Sir T. D. Lauder says:—"The bank is cut out and built up into terraces of different degrees of level, which are connected by flights of steps, and decorated by fountains—arched recesses—stone seats—and all those adjuncts usually found in old domestic gardens; and the whole is thus softened into the happiest gradual combination with the wildness of the neighbouring scenery. It was constructed by that Lord Belhaven who lived about the middle of the seventeenth century, of whom Nicol, in his Diary (page 233), gives us the following very strange history." The narrative is too long to be given here, but it may be said that the Lord Belhaven above mentioned was one of the cautioners for the Duke of Hamilton, whose estates were forfeited after Dunbar. Finding it inconvenient to meet the obligation imposed upon him in this connection, Lord Belhaven fled with a servant to the sands of Solway, and sent back thence with his servant his cloak and hat to his wife, as evidence that "in ryding by these

sandis, both he and his horse quhairon he raid were sunkin in these quick sandis and drowned, nane being privy to this, bot his lady and his man servand." Passing into England, he became a working gardener for six years, returning in 1659, "to the admiration of many, for during that hail space it was evir thocht he was deid." The results of the hard work of Lord Belhaven as a practical gardener are apparent in the Barncluith gardens we know. It appears that it was owing to Wm. Kirkpatrick Sharp having directed Sir Walter Scott's attention to this story that "the first idea occurred to the great author of the 'Bride of Lammermoor' that he should terminate the existence of the Master of Ravenswood by a death similar to that which was thus feigned by Lord Belhaven. . . ."

The party proceeded by the High Parks to Cadzow Castle, and thence to Chatelherault. On the bank opposite the entrance to the now altogether ruinous Cadzow Castle *Ribes alpinum*, though not indigenous, has been long established and grows profusely. At Chatelherault the wall surrounding the garden had been freshly pointed, and on observing this some solicitation was felt for the fate of the Evergreen Alkanet (*Anchusa sempervirens*), which has long grown in masses under its shelter. However, it was found that sufficient had been spared to carry on the old tradition.

WOODSIDE, BEITH, 18th September, 1915, and MAINS, MILNGAVIE, 9th October, 1915.—Mr. R. B. Johnstone, Conductor.—He reported as follows:—"There is nothing special to report about the fungus forays of 1915, except that the fungi have been very scarce this year. At the end of August there was promise of a good season in store for the mycologist, but after that time very dry and warm weather set in, which militated against the growth of the fungus mycelium. Showy and picturesque groups and clusters were, with perhaps one or two exceptions, conspicuously absent, and many of the species in the attached list were named from solitary specimens, many of which were in poor condition. This scarcity not only applied to our part of the country, but the same tale is reported from other parts of Scotland and from England.

“ This Society joined with the Andersonian Naturalists’ Society in the forays at Woodside, Beith, on 18th September, and Mains, Milngavie, on 9th October. The full list is herewith attached :—

W = Woodside; M = Mains.

<i>Lepiota amianthina</i> , M	<i>Hebeloma crustulini-</i>	<i>Russula ochroleuca</i> ,
<i>cristata</i> , M	<i>formis</i> , M	W M
<i>Tricholoma rutilans</i> , M	<i>Flammula sapinea</i> , W	<i>fellea</i> , W M
<i>saponaceum</i> , M	<i>Galera hyppnorum</i> , W M	<i>nigricans</i> W M
<i>resplendens</i> , M	<i>tenera</i> , M	<i>cyanozantha</i> , M
<i>Clitocybe nebularis</i> , M	<i>Tubaria furfuracea</i> , W	<i>Lentinus cochleatus</i> , W
<i>ectypa</i> , M	<i>Crepidotus mollis</i> , W	<i>Boletus luridus</i> , M
<i>Laccaria laccata</i> , M	<i>Stropharia aeruginosa</i> ,	<i>Polystictus versicolor</i> ,
<i>Collybia dryophila</i> , M	M	M
<i>confluens</i> , M	<i>Hypoholoma fascicu-</i>	<i>Poria vaporaria</i> , W
<i>velutipes</i> , M	<i>lare</i> , W M	<i>Stereum hirsutum</i> , W
<i>Mycena galericulata</i> ,	<i>capnoides</i> , M	<i>purpureum</i> , W
W M	<i>Coprinus micaceus</i> , M	<i>sanguinolentum</i> ,
<i>galopus</i> , W	<i>Paxillus involutus</i> , W	W
<i>haematopus</i> , W	<i>Hygrophorus pratensis</i> ,	<i>Clavaria cinerea</i> , W
<i>sanguinolenta</i> , W	M	<i>Calocera viscosa</i> , W M
<i>alkalina</i> , M	<i>Lactarius quietus</i> , W M	<i>Dacryomyces stillatus</i> ,
<i>Omphalia fibula</i> , W	<i>turpis</i> , W	W
<i>Pholiota spectabilis</i> , W	<i>blennius</i> , M	<i>Scleroderma vulgare</i> , M
<i>Inocybe rimosa</i> , M		<i>Sphaerobolus stellatus</i> ,
		W

COCHNO AND EDINBARNET, 15th April, 1916.—Conductor, Mr. L. Watt. — A party of ten met at Singer Station about 2.40. As the tramway cars do not yet run up Kilbowie Hill, we had to walk past Radnor Park till the Hardgate was reached. At the west end of the Gowan Hill stood the Roman Fort, and near it a fine section of the Roman Road was exposed at the time when the Manse was being built on the spot. From Hardgate we walked past the old village of Faifley, which is perhaps the oldest part of Duntocher. In the map of Scotland printed in 1790, Faifley is marked, while in the early years of last century Duntocher was known as “Glenhead.” Two of the old houses in Faifley still remain as relics of better days.

Proceeding up the Faifley brae to Cochno, the party paid a visit to the Clydebank and District Filters. Looking at

the building crowned with a large square tower, where the machinery is kept, one would think it was a school of some sort. Under the guidance of Mr. Rae, the manager of the water works, we were shown all the machines, not only for filtering, but for removing the brown colour which water from a peaty bottom acquires. The water otherwise is wholesome and good. Lime and sulphate of alumina are the two ingredients used. They form a white flocculent precipitate, which absorbs the colouring matter in the water. This colouring matter got worse when the water from the new reservoir at Burncrooks was introduced. This reservoir was formed by utilising a large hollow just a short distance south-west of the Whangie. The surface water area is 115 acres, the maximum depth 62 feet, and the total capacity 820,000,000 gallons. Seen from the Whangie, the reservoir looks like an old loch, and not one formed only two years ago. After tasting the water we ascended to the top of the tower, and from it we obtained a magnificent view. The valley of the Clyde from Erskine, the fine woodlands surrounded by the hills of Renfrew, Ayr, and Lanark were seen to advantage.

Leaving the Filters, we proceeded through Cochno towards Edinbarnet. The Hamiltons have long been connected with Cochno. Andrew Hamilton of Cochno was Lord Provost of Glasgow in 1541, 1553, and 1558; while he sat in the Scottish Parliament as the city's representative in 1546 and in 1572. He was returned as among the traitors and rebels of "Cliddesdale" for taking the side of Queen Mary, and was exiled, but his family managed to keep hold of the estates. A number of the trees in Edinbarnet near the house, previously measured by Mr. Renwick, were re-measured. The party then went in search of the large apple tree in the glen, which, according to the directions of the keeper, was situated where the skyline was formed of fir and ash trees, with a hollow covered with rushes in front. On reaching the tree, it looked fresher than when last visited. According to some statements, the ground on which it grows was once a garden belonging to the monks of Paisley, who at one time held most

of the land from Old Kilpatrick to Garscadden. This old apple tree is all that remains of the garden. After measuring it carefully we retraced our steps through Edinbarnet to the cup-and-ring markings. These still look well, but, being exposed to all weathers, time is telling on the rings, as they are losing their sharp edges. Before Auchnacraig House (which is a short distance south from the ring marks) was built, there were cup holes in a number of the stones on its site, but no rings round any of them. There is a fine group of cup-and-ring marks at Auchentorlie, which differ considerably from those at Edinbarnet.

The season being late, there were few flowers seen. The starry flowers of the Chickweed and the yellow flowers of *Ranunculus ficaria* (Linn.) were all that were noted.

The following trees were measured :—

Holly, S.S.E. of house, at 1 foot 8 inches, girthed 9 feet 10 inches. This tree divides into two almost from the base, the north stem at 3 feet 6 inches measuring 6 feet 0½ inches, and the south stem, at same height, 5 feet 1 inch.

Rowan, N.E. of house, with three stems, at 3 feet measured 13 feet 3 inches at 2 feet 6 inches south. The three stems at 1 foot from split measure 6 feet 11 inches, 5 feet 10 inches, and 4 feet 11 inches.

Beech, S.W. of house, at 3 feet girthed 13 feet 5 inches.

Elm, S.S.E. of house, at 2 feet measured 14 feet 5½ inches.

Sycamore, S.S.E. of house, at west entrance gate and side near road, at 2 feet measured 12 feet 9 inches.

Ash, near this, at 2 feet 6 inches girthed 9 feet 10 inches.

Apple, in Tourford Glen, at 1 foot 10 inches measured 8 feet 0½ inch. The trunk begins to divide at 3 feet 6 inches, into a number of stems. A flying buttress, which leaves the main stem near the ground and rejoins, at 3 feet 6 inches measured 2 feet 5½ inches.

ARROCHAR, 24th April, 1916.—Conductor, Mr. John R. Lee. —The weather conditions on the day of this excursion (the Glasgow Spring Holiday) being of the most unfavourable kind, the programme—which included an ascent of Ben Narnain—had to be abandoned. About half-past seven o'clock in the morning a brief glimpse of sunshine seemed to hold out hopes of improvement, but this, which was the first bright blink, was also the last for the day; and although six members met at Ross's Hotel, and bravely determined to make an attempt to carry out an excursion of some sort, the whole day's outing resolved itself into a walk to the scene of the "landslide" of three years ago, and a return to Arrochar in the rain. The district is rather famous for wet weather, and Easter Monday, 1916, certainly helped to keep up its reputation. The fall of earth, rocks, and debris which took place as mentioned above, was along the course of a small stream which descends the southern slope of Ben Arthur at one of its steepest parts, and an enormous mass of material was precipitated into the bed of the Glen Croe Burn, exactly opposite the shepherd's cottage at Creagdhù; the immediate effect being the ponding back of the stream and consequent flooding of the homestead. The road from Arrochar to Inveraray, which traverses the whole length of Glen Croe, was at this point completely buried, and a new cutting had to be made. During the year following the landslip the mountain-side bore evidence of the catastrophe, the scar being visible even from a passing train on the railway, which is on the further side of Loch Long, at a distance of about $2\frac{1}{2}$ miles. But the healing powers of Nature soon begin to tell, and it was remarked by those present at the excursion that, except for the evident newness of the roadway and the bridge which carries it over the small stream, there is little now to indicate that so recently an occurrence of such an alarming kind had taken place. On the way back it had been the intention of the party to walk some distance down the road towards Coilessan, which skirts the beautifully wooded policies of Ardgartan at the mouth of Glen Croe. The weather, however, having by this time

become much worse, it was decided to abandon this, and the party returned to Arrochar for tea. Owing to the conditions, nothing could be done in the way of observing or recording any of the natural features of the district, and consequently nothing of interest falls to be reported. Some 32 species of birds were observed. Summer migrants were scarce, only the Wheatear, the Common Sandpiper, and the Lesser Black-backed Gull being seen. A pair of Ravens—a bird which does not appear in our records for this district—were noted on the hills at the entrance of Glen Croe. A few Cormorants were fishing at the head of the loch, and two Little Grebes were seen swimming and diving about the same place. The Long-tailed Tit was observed near Ardmay, and the Stonechat was at its old haunt near the Torpedo Station.

BELLAHOUSTON PARK, 2nd May, 1916.—Conductor, Mr. James Whitton.—Between twenty and thirty members and friends met at the rock garden which now occupies the site of Ibroxhill House. As an introduction to the evening's proceedings, the following outline of the history of Ibroxhill and the genesis of the rock garden was given. About the beginning of the nineteenth century the property of some twenty-eight and a half acres, then known as Myrtlebank, was acquired by Mr. John Bennet, writer, Glasgow, who removed the old dwelling-house and built in 1801, on a fresh site, a new mansion, to which he gave the name of "Ibrox House." In 1816 the property was purchased by Mr. John M'Call, merchant, Glasgow, who, to distinguish the property from the larger Ibrox estate, re-named it "Ibroxhill." The property remained in the possession of the M'Call family until 1903, when it was purchased by a building syndicate who, finding unexpected difficulties in developing it, re-sold it to the Corporation of Glasgow (Parks Department) in 1904, and it now forms an integral part of Bellahouston Park. The desirability of securing Ibroxhill, to form a better entrance to Bellahouston Park from the city, was recognised from the first, but the purchase price and other considerations delayed matters. Thanks to the generosity of the Bella-

houston Trustees, terms were finally adjusted, and Ibroxhill grounds now form an attractive addition to one of the city's largest and most popular parks. For a time the mansion-house was used as a tea-room for park visitors, but in 1913 it was discovered that dry rot had broken out throughout the house to such a serious extent that the demolition of the building was the only course to follow. Permission having been granted to use the old building material to form a rock garden, the work of demolition proceeded during the winter months of 1914-15, and the formation of the rock garden was undertaken, as opportunity offered, by the ordinary staff of the park. By the month of April, 1915, the work was sufficiently advanced to permit the planting being commenced, and this was steadily pushed on till, on 1st July, 1915, the rock garden was opened to the public. Judging by the number of visitors who frequent it and the interest manifested in the plants within its bounds, the formation of this garden as an additional attraction to the park seems amply justified. The portico, which is of good design, of the old mansion-house was left to mark the site of the house more pointedly. Entering the rock garden by the old portico the party made a careful inspection of the plants. It was quickly observed that the date was too early to see the plants at their best. Owing to the backwardness of the season many subjects were not in bloom which in ordinary course ought to have been in their glory. The most notable in flower were *Saxifraga apiculata*, *S. Elizabethia*, *S. Delavayi*, *S. cordifolia*, and *S. Bathoniensis*. Many more in the fairly full collection were in bud, but requiring a week or ten days' growth to be in full bloom. There were some flowers open in the collection of Aubretias, but they also required time and growing weather conditions. It was pointed out that these Aubretias had "wintered" better there than in any of the parks, showing that the situation was favourable. The climatic conditions of Glasgow are not very favourable to these and any other Alpine plants which possess hairy foliage. Several of the daintier forms of Narcissi were in bloom—those noted being

N. triandrus nanus, *N. t. pallidus*, *N. cyclamineus*, *N. minor*, and *N. junctifolia*. Attention was drawn to a plant which seems a perpetual bloomer, as it had been in flower all through the autumn and winter. This was *Potentilla alchemelloides*, a white-flowered dwarf subject of modest dimensions, but of value in a rock garden. Of the newer or less known species of *Primula* several were noted as thriving, one group of *P. Veitchii* being very robust and in spike. *P. Cockburniana*, amongst stony material, was healthy and strong. *P. frondosa*, *P. involucrata*, &c., were all in rude health—not to speak of the “blue” forms of *P. vulgaris* and the vigorous *P. japonica*. The only failure was *P. Forrestii*, which had entirely collapsed. A fine colony of *Cortusa pubens* was noted as having successfully passed through the winter. *Ramondia pyrenaica*, though not in bloom, was strong and healthy. *Erythronium Hartwegii* and *E. revolutum*, *Geum montanum*, *Armeria caespitosa*, *Anemone blanda*, *A. ranunculoides*, *Viola gracilis*, and *Arabis albida* were in full flower, along with several *Muscari* or grape hyacinths—of these, the variety “Heavenly Blue” was very striking.

Along with these there is a selection of dwarf growing shrubs, noticeably amongst them the various forms of “Alpine rose,” *Rhododendron ferrugineum*, and others. One in bloom, *R. S. Arnott* (named after the Alpine expert, Provost Arnott of Maxwelltown), is a fine dwarf shrub for a rock garden, as well as that tiny-blossomed one, *R. racemosum*. There is also a collection of dwarf *Berberises* amongst which was *B. Wilsonii*, still carrying a few of its pink berries. Amongst the *Cytisuses*, the erect and prostrate forms of *C. Kewensis*, *C. Bearii*, *C. versicolor*, *C. purpureus*, and *C. Andreanus*, also a prostrate form of that variety, *C. præcox*, *C. albus*, &c., were in bud and promising an interesting display. *Viburnum rhytidophyllum*, a comparatively new species from China, has proved its hardiness, and was showing many flower heads. Another new Chinese shrub, *Lonicera nitida*, is also hardy and somewhat

precocious in growth, as it started to grow at the beginning of January. If it was as precocious in flowering it would be a valuable plant, as its hardiness and compact habit of growth are desirable qualities. Those plants named are but a tithe of those in the garden, but it must be borne in mind that many subjects planted are purely experimental, as in many cases their ability to withstand the climatic and atmospheric conditions of Glasgow has to be proved. So far, many which were looked upon as unsuitable or doubtful subjects to plant are proving amenable under the conditions there, which apparently are meeting their requirements.

Having examined the rock garden, the party next inspected the old walled-in kitchen garden, which is now devoted to ornamental purposes. The walls are covered with roses, Ceanothus, Escallonias, Buddleias, &c., partly for display and partly for experimental purposes. One border is devoted to shrubs not commonly met with outside plant nurseries, with the view of testing their suitability for town planting. In another there is a collection of Narcissi of the newer sorts. While most of the trumpet varieties were past, several of the medium sorts were in bloom, along with the *poeticus* section. The outstanding varieties of the trumpets were King Alfred, Alma, Cornelia, Olympia, Golden Bell, Santa Maria, Mrs. C. W. Earle, Sandow, Proserpine, and Queen Isabella. Of the *incomparabilis* section Bountiful, Constellation, Fireflame, Firelight, Homespun, Queen Sophia, and Red Star, and, amongst the lesser sorts, *Barri conspicuus*, Dorothy E. Wemyss, Vivid, Seagull, and White Hawk, whilst amongst the *Ledaii* section Maid of Athens, Fairy Queen, Pole Star, Salmonetta, and Una were apparently the favourites. The opinion was expressed, however, that there were too many and "too much alike" varieties. Amongst the other sections there were several interesting forms, especially the hybrid *Poetaz*. The best in bloom were Aspasia, Ideal, Irene, Klondyke, and Triumph. In the *poeticus* section such newer varieties as Cassandra, Chaucer, Glory, Horace, Minerva, The Bride, and White Standard

had many admirers. The collection of Tulips—Darwin and Cottage—were only in bud, but promising for a great show toward the end of the month. The border of ericaceous plants proved of interest to many. The forms of *Erica mediterranea* are very valuable as decorative plants in spring—some of the newer varieties had been in bloom since the middle of December.

Having exhausted the old garden, the party proceeded to inspect the collection of Narcissi on the lawn of Bellahouston House, which were planted with a view of testing their value for naturalising on grass lawns. The best there were *Narcissus pseudo-narcissus*, *N. teleamonius plenus*, *N. maximus*, *N. minor*, *N. Horsfieldii*, *N. Empress*, *N. Emperor*, *N. P. R. Barr*, *N. Henry Irving*, *N. Madam Plemp*, *N. Glory of Leiden*, *N. Countess of Annesley*, *N. Ard Righ*, *N. Sir Watkin*, *N. Cynosure*, *N. Duchess of Westminster*, *N. Barri conspicuus*, *N. Grandee*, *N. John Bain*, *N. Minnie Hume*, *N. poeticus*, *N. poeticus ornatus*, *N. Duchesse de Brabant*, *N. bulbocodium*, and *N. Queen of Spain*. The latter, by the way, grows better on grass than in cultivated ground. No doubt a number of these varieties will be superseded by newer ones. Meanwhile those noted have been planted for twelve years, and have proved satisfactory. It is needless to detail the failures!

POLLOK HOUSE, 6th May, 1916.—Conductor, Mr. John Cairns.—On the afternoon of Saturday, 6th May, by kind permission of Sir John Stirling Maxwell, Bart., a party of ten members and friends visited the gardens and policies of Pollok House, Pollokshaws. Entering by the New Lodge, the party proceeded in the direction of the mansion house, in front of which, on rising ground, great masses of daffodils have been naturalised amongst the grass. These were in full flower, and made a striking display. On reaching the Flower Garden, Mr. Heron, the head gardener, met the party and pointed out the various features of interest. Sir John is well known as an enthusiastic arboriculturist and horticulturist. He has made great improvements in the

vicinity of the mansion house and throughout the policies, and is developing numerous features which should add considerably to the beauty of the surroundings as the years go on.

Sir John and Lady Maxwell, unfortunately, had to be away that afternoon, but the following excerpt from a letter he had left for Mr. John Renwick is rather interesting:—

“The other day Dr. Augustine Henry called my attention to an article by my grand-uncle about the trees and shrubs here, in *Loudon's Gardeners' Magazine*, 1837, vol. xiii. I think you are interested in the measurement of trees, and if this article is not known to you, I will have a copy sent you. The measurements of several individual trees are given, taken in 1812 and 1836; but, unfortunately, most of these trees are gone, and the others it is impossible to identify. Sir John mentions in this article a number of exotic trees and shrubs which he had introduced. Of these the Turkey Oak and Lucombe Oak are still to be found, and a few varieties of Maple, Elm, and Poplar. All the more delicate things seem to have succumbed to wind, frost, or smoke. The following excerpts, which are all I have by me, may interest you:—

“‘The Liquidamber is extremely thriving.’

“‘The Walnut generally ripens its fruit, while the Spanish Chestnut seldom does.’

“‘The Cedar of Lebanon grows well here. I have inarched several Cedars upon the Larch, which seems to promise well, and also upon Spruce and Silver Firs more recently.’

“‘*Magnolia grandiflora* has stood out as a standard for three or four years, and the Catalpa, Judas tree, and Mulberry also. The other deciduous Magnolias grow well, and the deciduous Cypress grows luxuriantly. The Myrtle has been out of doors for two years in severe winters. The Bay tree grows very well and the Arbutus in open and exposed situations, but they require dry subsoil. The *Calmia* grows well, also the Cork tree, though very slowly.’

“‘The Virginian Scarlet Oak grows slowly and is brittle, but the *Quercus tinctoria** promises to grow well.’

“‘A kind of Ash with undivided leaves grows rapidly, and is a handsome tree.’

“Many of these things have been tried again lately, but have not proved hardy, and I think Sir John's article must have been written in a sanguine moment. Among the things which survive from his day there is a type of *Rhododendron dauricum* which I have not seen

* Now known as *Q. velutina*, Lamarck.

elsewhere, and a Fastigate Oak. Unfortunately Hooker's Himalayan Rhododendrons never found their way here, but we have lately got some of the hardier sorts, and they are doing fairly well and beginning to flower. Some of the new Chinese varieties also appear to be hardy. Like everything else, the Rhododendrons suffered badly in the November frosts."

The Wall Garden was most attractive, and *Aubretia* in many varieties, *Iberis sempervirens*, *Alyssum saxatile*, and several *Saxifrages* made a fine display which would have been much enhanced had the sun consented to shine, but unfortunately the rain, which had been threatening, now came on rather heavily. In the Flower Garden the Tulips were coming into full flower, and gave promise of a great blaze of colour in a few days. As we passed on to inspect the interesting Shrubs which are trained on the terrace walls, abundant evidence was seen of the damage caused by the November frost to which Sir John referred in his letter. *Phlomis fruticosa*, L., the Jerusalem Sage, was very much injured, *Pittosporum tenuifolium*, Banks (Syn. P. Mayi), *Azara microphylla* Hook, f., and *Photinia serrulata*, Lindley, were killed to the ground. A number of the New Chinese Rhododendrons had also suffered very severely.

The following are a few of the shrubs noted:—

Corylopsis spicata, Siebold, is one of those early flowering shrubs which attract attention at a time of the year when only a few competitors are in bloom. Its drooping spike of pale yellow, fragrant flowers, is produced before the leaves (which resemble those of the Common Hazel) begin to expand.

Artemisia tridentata, Nuttall, was growing quite vigorously. Bean, in "Trees and Shrubs hardy in the British Isles," says:—"This shrub is one of those forms in the dry alkaline districts of Western North America which are known collectively as 'sage brush,' and cover immense areas with a grey, monotonous vegetation."

Several specimens of *Arbutus Menziesi*, Pursh., were observed, but only one had escaped serious injury by frost.

Prunus triloba, Lindley, was represented by a vigorous specimen. This is one of the most handsome of early flowering shrubs, and is a native of China. The form usually seen in gardens has semi-double flowers of a rosy-white tint, but deep rose whilst in bud.

Prunus fruticosa, Pallas, the Ground Cherry, was growing beside the last-mentioned species. It is a native of continental Europe and parts of Siberia, and is supposed to have been introduced into England about 1597. It is of rather low growth, with slender, pendulous branches. The flowers are white and produced in umbels of four or thereby.

Desfontainea spinosa, Ruiz and Pavon. This cannot be considered quite a hardy shrub in the immediate vicinity of Glasgow, but with the shelter of a wall it is thriving well at Pollok, and appeared to have escaped serious damage by frost.

Pyracantha coccinea, Roemer (Syn. *Cratægus Pyracantha*, Medicus), the Pyracanth or Fiery Thorn, was growing vigorously, trained against a wall. It is very attractive when covered with its corymbs of white flowers, but even more so when in fruit, as the orange-scarlet berries make it a most conspicuous object in autumn and early winter.

Ligustrum strongylophyllum, Hemsley, a Privet of very distinct appearance. Bean says it is a native of China and was introduced by Maries in 1879.

Lonicera Morrowi, A. Gray, a shrubby Honeysuckle from Japan, closely allied to the well-known *L. xylosteum*. Its brilliant red fruits are attractive in autumn.

Lonicera Standishii, Carrière, a Chinese species which produces its creamy-white, fragrant flowers during winter and early spring.

Magnolia stellata, Maximowicz, was in flower. It is a Japanese species, introduced to Britain in 1877. The fragrant, pure white flowers are produced abundantly as early as April, but unfortunately they rarely escape damage by frost or cold winds. It is one of the most handsome of the low-growing species.

Magnolia Soulangeana, Soulange-Bodin. This is a hybrid between *M. conspicua* and *M. obovata*, and is now to be seen in gardens more frequently than any other Magnolia. The flowers appear before the foliage, and are very attractive; they are of large size, somewhat tubular at the base; the petals are white on the inner surface but stained with purple on the outer.

Magnolia tripetala, L., the umbrella tree. This is a native of North America, and forms a tree which attains a height of 30 to 40 feet. Its leaves are very large, often 16 inches long. It produces its large, white flowers in summer; the fruit is cone-shaped, about four inches long, and of a deep purplish-red colour.

Rhododendron racemosum, Franchet. This is a species of dwarf compact growth, from the Yunan district of China. Bean says it was first raised in the Jardin des Plantes at Paris in 1889, where he saw it in flower in November and brought some seedlings to Kew. The seed had been gathered and sent to Paris by Père Delavay. It is proving to be quite hardy in Scotland, and is becoming exceedingly popular in gardens.

Rhododendron ciliatum, Hook, f., and *R. glaucum*, Hook f., were also noted. Mr. Heron drew attention to *R. dauricum*, L., of which he had layered several branches of one plant, and hoped to be able to increase the stock of it by this method. This is the type to which Sir John refers in his letter. We were too late to see it in flower, as it usually blooms in February or March.

Only two trees were measured, viz. :—An Oak on garden bank, which girthed 12 feet 2 inches at 4 feet 9 inches, and a Beech, also on garden bank, on the slope above the Oak, which measured 12 feet 3½ inches at 4 feet 3 inches.

The rain had now become so heavy that further investigation of the fine collection of trees and shrubs had to be abandoned, but it was quite evident that another visit would be well repaid.

In a letter subsequent to the excursion Sir John Stirling Maxwell stated with reference to one of the Oaks recently planted at Pollok House:—"The Oak, of which a sample was enclosed, was bought as the ordinary Holm Oak (*Quercus Ilex*). This species is very variable, especially in the young stage. Garden varieties, such as the Lucombe and Fulham Oaks (a seedling form of the Lucombe Oak) and Turner's Oak, which last now seems only to be obtainable in the variety sold as *Quercus Austriaca*, all seem to stand smoke better than most trees. The same is true of *Quercus Mirbeckii*. Last year all these Oaks were browned by the November frosts, but as a rule they remain quite fresh and green till Christmas, and I know of nothing which would make a more welcome change in this district than the planting of them in our villa gardens."

ORCHARD COUNTRY, 13th May, 1916.—Mr. Alex. Ross, conductor.—This excursion was a joint one with the Hamilton Society, and fifteen individuals took part in it. The party proceeded from Dalsersf Station towards the Clyde, crossed Garrion Bridge, skirted the Mauldslie Policies, and regained the Clyde at Milton Lockhart. The bank of the river was followed to Crossford, whence the road was taken to Braidwood. After the heavy rains which had fallen recently, the party were fortunate in having dry weather. Sunny and bright at the start, it dulled down somewhat later on. The recent rains had left their mark, however, and the going at times was arduous. This was particularly so about Jock's Gill, where the right-of-way was rather difficult to negotiate. The district visited has of late years taken its place on the programme of the Society for an annual run through, and most of its notable Plants and Birds have already been recorded in the *Proceedings* of the Society. Vegetation on this occasion was observed to be backward, and many of the old favourites were not yet in evidence. The White Meadow Saxifrage (*Saxifraga granulata*), the Hairy Rock Cress (*Arabis hirsuta*), the Bitter Cress (*Cardamine amara*), and the Leopard's Bane (*Doronicum pardalianches*) were seen at their old station on the banks of the Clyde. A

brave show was made by Sweet Cicely (*Myrrhis odorata*), and Jack by the Hedge (*Sisymbrium alliaria*) was noted all along the journey. Opposite the junction of the Nethan a few plants of Honesty (*Lunaria*)—doubtless an outcast—were seen in flower. The Pear and Plum were in fine bloom in the orchards, and this alone would have made the excursion a success. Looking back from the higher ground near Braidwood, the hollows and glens looked glorious in their wealth of white blossom. The members have never in their excursions seen this displayed to better advantage. The ornithologists were somewhat disappointed. They had been on the outlook for the Blackcap and Garden Warbler. The former was neither seen nor heard, and they were almost giving up hope of hearing the latter when its notes were heard in the orchard as the party approached Crossford. The Wood Wren was scarce, being heard only in the woody strip edging Milton Lockhart.

SPRINGBURN PARK, 16th May, 1916.—Conductor, Mr. R. Thompson.—The party met at the Balgray entrance, on the west side of the Park. The Rockery, situated near this entrance, was the first place of interest visited. Here the following Plants were noticed:—*Garrya elliptica*, *Trollius europæus*, *Pulmonaria officinalis*, Berberis, and Heath in Var. *Prenula denticulata*, &c. Many varieties of Rhododendron, Azaleas, and Broom were showing flower, but not quite at their best. Leaving the Rockery, we proceeded eastwards to the Reid Winter Garden, the main block of which is filled mostly with Tree-ferns and Palms of various kinds. Of the four side houses, two are devoted to flowering plants and two to foliage. In the Flowering Houses Rhododendrons of the finer varieties were to be seen, with side benches of Carnations, Calceolarias, Cytisus, and some of the later flowering bulbs. In the warmest house are kept mostly foliage plants, but a plant of *Crinum giganteum* was flowering there, as also were the Coffee tree and the Cinnamon plant. *Clerodendron* was in fine flower on roof. In the last house, ferns are mostly grown, a few Orchids in flower being interspersed amongst the ferns on the side benches. Leaving the Winter Gardens,

we visited the Model Yacht Pond, passing the Reid Statue on the way; the ornamental pond, which is at the side of the park nearest Stobhill Hospital; the flagpole mound, from which a fine view of the surroundings can be obtained; and the bowling greens. From thence we made round to the north-west corner of the park, near Mosesfield Museum, where such fine views of the hills can be got when the atmospheric conditions are suitable.

NETHER AUCHENDRANE, 23rd May, 1916.—Reported by Mr. Alex. Ross.—In the regrettable absence of Mr. Renwick, those taking part in the excursion, who numbered seven, arrived in Ayr without a conductor. Mr. N. G. Reid stepped into the vacant post, took charge of the party, and led them to the Auchendrane Policies. Here they were met by the forester and shown over the grounds. In the avenue attention was directed to the notable trees which make a visit to this estate so interesting. The cut-leaved Lime (*Tilia platyphyllos*, Scop. var. *asplenifolia*), the Eagle's Claw Maple (*Acer platanoides*, L. var. *laciniatum*), and the cut-leaved Hornbeam (*Carpinus betulus*, L. var. *incisa*), were greatly admired on account of their fine foliage. A fine row of six Silver Firs (*Abies pectinata* DC)—the Union Trees, so called because they were planted in the year of the Union of the Scots and English Parliaments in 1707—were visited. Comment was made on the variation in girth and height of these trees, which one would have expected to show less difference, as they were planted at the same time and have grown up in practically the same soil and under the same conditions. The Tulip Tree (*Liriodendron tulipifera*, L.) was showing well-grown buds, as was also *Magnolia tripetala*, L., the three-petaled Magnolia. *Pyrus sorbus*, Gaertn, the true Service tree, a little off the avenue, was covered with bloom. The Witch's Broom (*Aecidium elatinum*), mentioned in one of Mr. Renwick's reports, was still affecting the lower branches of some of these trees. Many other trees of botanical and historical interest occupied the attention of the party. It was to be regretted that no measuring tape was with the party, as no measure-

ments could be taken or comparison made with those of Mr. Renwick, on the occasion of the last visit. One of the sights on both sides of the avenue, and, indeed, over most of the parts of the estate visited, was the profusion of the Bird's-Nest Orchid (*Neottia Nidus-avis*, L.) On no other occasion had any of the excursionists seen such a show of these plants. They were in groups, large and small, under the trees all over the grounds. Tway Blade (*Listera ovata*) was plentiful, and a number of plants of *Epipactis latifolia*, Sw., were observed. *Aram maculatum* was abundant, and in many of the flowers the spathe was almost open. From the avenue the party proceeded for a short distance along the banks of the river Doon. A beautiful blue flower growing there made a striking appearance on the bank. On inquiry it was found to be *Omphalodes verna*, Mœnch., Venus' Navelwort, a plant which belongs to the Boragineæ. It is a native of S. Europe, and was introduced to Britain in 1633. Another plant of somewhat rare occurrence in our district was met with here in *Lamium galeobdolon*, Crantz. From this point the party proceeded to the Mansion House, where they were entertained to tea. From the room in which they were a fine view of the river is got, which is enhanced by the presence of a stately Scots Fir, which is reckoned to have been planted in 1707. In front of the house, on the lawn, is a notable Birch tree. Mr. Renwick remarks of it in 1907 that "it is probably the finest tree of the species in Scotland, and nearly the largest." The glass houses and the gardens were next visited, and there the gardener pointed out the plants which were noteworthy. There is little under glass, but what there is is good. On the way out, near the gate opening on the avenue, attention was called to a tree in fine flower. This proved to be a good specimen of the Cockspur Thorn (*Cratægus Crus-galli*, L.) Mr. Rennie reports that 33 species of birds were observed, 10 of them being summer migrants. These were the Redstart, which was seen and heard frequently, the Whitethroat, the Willow and Wood Wrens, the Tree Pipit, Swallow, House Martin, Swift, Corncrake, and Common Sandpiper.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII., No. 4.]

[February, 1920.

A Contribution to our knowledge of the Fauna of the Clyde Sea-Area.

By LOUIS P. W. RENOUF, B.A.

(Bute Laboratory and Museum, Rothesay).

[Read 31st October, 1916.]

THOUGH these notes include little or nothing in the way of new species for the Clyde Sea-Area, it is hoped that they may be of some value as recording something of the Fauna of a definite area, for so many of the Clyde records are extremely vague as regards locality and other details.

The area under consideration is marked on the charts as "Ascog Patches," and consists of two small areas of hard ground, covered by less than 10 fathoms of water, and lying about 1,000 yards off Ascog Isle, on the eastern side of Bute. Lines drawn from Ascog Isle to Knock Castle on the mainland, and from Toward Bank to Bruchag Point on Bute, intersect over the tail of the larger and more southerly of the two patches. This larger patch is some 900 yards long by 440 yards wide at its greatest breadth, whilst the smaller patch measures some 300 by 170 yards. As the two patches overlap to some small extent so that a length of 1,100 yards includes them both, and the passage between them is but 60 yards wide at its narrowest, and is covered by but 2 fathoms more of water, the two patches will be treated as a single area.

It may be of interest to look at the neighbouring 10-fathom line. Off Ascog Isle this approaches to within 400 yards of the tail of the larger patch; to the north of the smaller patch it is within 350 yards—a large off-shore shallow lying in this region; whilst Toward Bank itself is 2,300 yards away, the 10-fathom line around it being some 300 yards nearer.

The patches themselves consist of rock and stones, with some shells, one small area of rock south-east of the centre of the larger patch rising to within $4\frac{1}{2}$ fathoms of the surface; and they are surrounded by mud under up to 15 fathoms of water on the Bute side—more to the north and east.

So far the dredge* has yielded about 160 species of animals from this small area, distributed as follows amongst the various groups:—Protozoa, 2; Porifera, 5; Coelenterata, 23; Mollusca, 50; Vermes, 24; Polyzoa, 10; Crustacea, 22; Echinodermata, 15; Tunicata, 5; Pisces, 3. These figures are only approximate, as a number of forms are yet to be identified, but they are near enough to afford a good idea of the population of the area.

The following list of species is based on the examination of over a dozen days' dredging, between June and October, 1915, and March and October, 1916, and about another half-dozen hauls taken since the paper was read.

The following abbreviations are used to indicate the relative abundance of the species:—V.R. = very rare; R. = rare; C. = common; V.C. = very common. Italic letters indicate that specimens were obtained in every or nearly every haul.

Square brackets [] denote some doubt about the species.

Double brackets { } denote that the animal probably came from the mud between the patches.

† Indicates that shells only were found.

The figures and letters refer to the notes which follow (see pages 117-9).

The nomenclature followed is in the main that used in the "Plymouth Marine Invertebrate Fauna."

Protozoa.¹

Salpingoeca curvipes (S.K.)

"*Vorticellid*."

* The dredges used were the ordinary iron pattern, 4 and 5 feet wide.

Porifera.

- Leucosolenia botryoides* (E. & S.) R. *Suberites domuncula* Olivi. R.
Sycon coronatum E. & S. R. *Clione celata*. Grant. R.
Halichondria panicea (Pall.) R.

Coelenterata.

- Hydractinia echinata* Flem.² V.C. *Hydrallmania falcata* (Lin.) V.R.
Tubularia coronata Abild. R. *Antennularia ramosa* (Lamouroux)
Obelia geniculata Lin. R. R.
O. plicata Hincks. R. *Plumularia catharina* Johnston. C.
[*Campanularia flexuosa* Hincks] V.R. *P. pinnata* (Lin.) R.
C. verticillata Lin. R. *P. frutescens* Ell & Sol. R.
Gonothyrcea gracilis Sars. V.R. *Alcyonium digitatum* Lin. R.
Lafoëa dumosa (Flem.) V.R. *Actinia equina* Lin.³ V.R.
L. fruticosa Sars. R. *Metridium senile* (Lin.)⁴ R.
Halecium beani (Johnston) R. *Adamsia palliata* (Bohadsh)⁵ V.C.
Sertularella polyzonias (Lin.) R. *Stomphia churchiæ* (Gosse)⁶ R.
Sertularia sp. V.R. {*Bolocera tuediæ* (Johnston)} R.

Mollusca.

- Craspedochilus cinereus* (Lin.) V.C. *Mya truncata* Lin.† R.
Helcion pellucidum (Lin.) V.R. *M. arenaria* (Lin.)† V.R.
Puncturella noachina (Lin.) C. *Ensis ensis* (Lin.)† R.
Emarginula fissura (Lin.) C. *Saxicava rugosa* (Lin.)† R.
Giobula cineraria (Lin.) R. *Mytilus edulis* Lin.† R.
G. umbilicata (Mont.) R. *Volsella modiolus* (Lin.)† R.
Calliostoma miliare Bower. R. *Pecten clavatus* var. *septemradiatus*
Lacuna divaricata (Fab.) R. Müll. C.
Lamellaria perspicua (Lin.) R. *P. maximus* (Lin.) R.
Aporrhais pes-pelecani (Lin.) R. *P. opercularis* (Lin.) C.
Buccinum undatum (Lin.) R. *P. pusio* (Lin.) R.
Natica sp. † R. *P. varius* (Lin.) R.
Tritonofusus gracilis da C. R. {*Lima hians* (Gmel.)} R.
{*Oscanius membranaceus* (Mont.)} {*Astarte sulcata* da C.†} R.
V.R. *Arctica islandica* (Lin.)† R.
Aplysia punctata Cuv. V.R. *Lucina borealis* (Lin.)† R.
Doto sp. V.R. *Dosinia exoleta* (Lin.)† R.
Aeolids—four of apparently three *Venus ovata* Penn. R.
different species. V.R. *V. gallina* Lin. R.
Spawn of? *Nudibranch* gen. sp. *Tellina crassa* (Gmel.)† R.
Archidoris tuberculata (Cuv.) V.R. *Tapes decussata* (Lin.) R.
Goniodoris castanea A. & H. V.R. *Cardium nodosum* Turt. R.
Dentalium entalis Lin.† R. *C. echinatum* Lin. V.R.
Nucula nitida G. B. Sow. R. *C. norvegicum* (Speng.) V.R.
Anomia ephippium Lin. R. *Sepiola* [scandica Steens.]⁷ V.R.

Vermes.

- | | |
|---|---|
| <i>Eunoa nodosa</i> (Sars.) V.R. | <i>Cirratulus cirratus</i> (O.F.M.) V.R. |
| <i>Harmothoë imbricata</i> Lin. C. | { <i>Sabella pavonina</i> Sav. } C. |
| <i>Lagisca floccosa</i> (Sars.) V.R. | Gen. sp. C. |
| <i>Lepidonotus squamatus</i> (Lin.) C. | <i>Pomatocerus triqueter</i> (Lin.) V.C. |
| <i>Halosydna gelatinosa</i> (Sars.) V.R. | <i>Serpula vermicularis</i> Lin. V.C. |
| <i>Nereis peiagica</i> Lin. V.R. | <i>Protula tubularia</i> (Mont.) C. |
| <i>Chaetopterus variopedatus</i> Ren. B. | <i>Spirorbis borealis</i> Daud. C. |
| [<i>Thelepus cincinnatus</i>] (O.F.M.) V.C. | [<i>Phascolium strombi</i> Mont.] V.R. |
| { [<i>Polynnia nebulosa</i> (Mont.)] } R. | <i>Micrura</i> . R. |
| <i>Pectinaria auricoma</i> (Müll.) V.R. | <i>Leptoplana tremellaris</i> (O.F.M.) V.R. |
| <i>P. belgica</i> (Pall.) V.R. | |

Polyzoa.⁹

- | | |
|--|--------------------------------------|
| <i>Gemellaria loricata</i> Lin. | <i>Stomatopora granulata</i> M. Eds. |
| <i>Bugula avicularia</i> (Lin.) | <i>Pedicellina cernua</i> (Pall.) |
| <i>B. flabellata</i> Gray. | <i>P. gracilis</i> Sars. |
| <i>Membranipora membranacea</i> (Lin.) | |

Crustacea.

- | | |
|---|--|
| <i>Balanus balanoides</i> (Lin.) V.R. | <i>E. cuanensis</i> (Thomp.) V.R. |
| <i>B. crenatus</i> Brug. R. | <i>E. prideauxii</i> (Leach) V.C. |
| <i>Gnathia</i> sp. ¹⁰ V.R. | <i>Anapagurus hyndmani</i> (Thomp.) C. |
| <i>Isothea baltica</i> (Pall.) V.R. | <i>Lithodes maia</i> (Lin.) ¹¹ V.R. |
| <i>Pandilus annulicornis</i> (Leach) V.R. | <i>Ebalia</i> sp. ¹² V.R. |
| <i>Crangon vulgaris</i> (Lin.) V.R. | <i>Macropodia rostratus</i> (Lin.) R. |
| <i>Galathea dispersa</i> Bate. C. | <i>Inachus dorsettensis</i> (Penn) C. |
| <i>G. nexa</i> Emb. R. | <i>Hyas coarctatus</i> Leach. R. |
| <i>G. intermedia</i> Lillj. R. | <i>H. araneus</i> (Lin.) V.R. |
| <i>Munida rugosa</i> (Fab.) R. | <i>Cancer pagurus</i> (Lin.) V.R. |
| <i>Eupagurus bernhardus</i> (Lin.) V.C. | <i>Portunus depurator</i> Leach. V.R. |

Echinodermata.

- | | |
|---|---|
| <i>Cucumaria planci</i> (Marenz) V.C. | <i>Asterias rubens</i> Lin. R. |
| <i>C.</i> sp. ¹³ V.R. | <i>A. rubens</i> var. <i>violacea</i> (O.F.M.) R. |
| <i>Psolus phantapus</i> (Strussenf.) ¹⁴ R. | <i>Ophiura albida</i> Forbes. R. |
| <i>Antedon bifida</i> (Pen.) C. | <i>O. ciliaris</i> (Lin.) V.R. |
| <i>Porania pulvillus</i> (O.F.M.) V.R. | <i>Ophiopholis aculeata</i> (Lin.) R. |
| <i>Solaster papposus</i> (Fab.) R. | <i>Ophiothrix fragilis</i> (O.F.M.) V.C. |
| <i>S. endeca</i> (Lin.) R. | <i>Echinus esculentus</i> (Lin.) ¹⁶ V.C. |
| <i>Henriciu sanguinolenta</i> (O.F.M.) R. | |

Tunicata.

Ascidia elliptica (A. & H.)*Styela informis* (Forbes).*A. plebeia* Ald.*Didemnum niveum* Giard.*Corella parallelogramma* (O.F.M.) C.

Pisces.

Cottus scorpio Lin.*Syngnathus acus* Lin.*Cyclopterus lumpus* Lin.¹⁷

Notes.

¹ The Protozoa have not been worked at. A Vorticellid and the *Salpingæca* were noticed on *Campanularia verticillata*.

² As usual on gastropod shells containing *Eupagurus bernhardus*.

³ I am unaware that this pre-eminently shore-form has ever been taken in the dredge. One specimen only was met with.

⁴ One specimen only, undergoing fission. This was kept alive for some time and photographs taken of it in various stages of contraction and expansion.

⁵ As usual in company with *Eupagurus prideauxii*.

⁶ This species is so extraordinarily lively for an anemone that a few words concerning it may prove of interest. The specimens from our area behaved so exactly like those described by Gosse that I venture to quote him verbatim:—"In health *Stomphia* is remarkable for its extreme versatility of form. The column is sometimes cylindrical, sometimes shaped like a dice-box, sometimes like an hour-glass, while frequently successive constrictions chase one another along the extent. The base, when the animal is free, is sometimes concave, at others convex, and occasionally conical, while not unfrequently these forms are combined, the centre being conical while the rest is concave—a cone within a crater. The disc is sometimes a deep bell, like a convolvulus; then a low cone, with the widely-gaping mouth crowning the summit."

—Gosse's "*Hist. of Bt. Anem. and Corals*," 1860 (p. 225).

⁷ But one specimen, presumed to be *scandica*, was seen. It escaped as the dredge reached the surface.

⁸ Though few living *Chaetopterus* were taken, tubes were abundant, covered with hydroids and polyzoa.

⁹ Probably all, except *membranipora*, common on *Chaetopterus* tubes.

¹⁰ This may be a new species of *Gnathia*. Mr. Alexander Patience says concerning it.—“Your specimens of *Gnathia* agree with some I gathered many years ago. There are 2 species recorded from the Clyde—*G. maxillaris* (Mont.) and *G. hobdavi* (Bate). Your specimens differ from Sars’s drawing and description of *G. maxillaris* in several respects—Sars, however, is not absolutely certain that the Norwegian species he is describing is Montague’s species. Bate in describing *G. hobdavi* places it under ‘doubtful species,’ and his figures and description leave *much* to be desired. Unless the original specimens are extant and have been re-described—and I don’t think they have—then Bate’s species should be rejected. Robertson recorded it from the Clyde, but the record must be accepted with considerable reserve.”

¹¹ Two males and one female, the latter undergoing ecdysis, were taken together—May, 1916.

¹² One female in berry, taken July, 1915.

¹³ “Head” only of a large form.

¹⁴ *Psolus* is a particularly interesting form, for not only does it differ from the majority of British holothuria in having distinct “dorsal” and “ventral” aspects, but when at rest it very closely resembles a tunicate. So close is this resemblance that it has been described as an ascidian by at least two different authors. The paintings showing a specimen from three different views are by Miss Macdonald, of Dowanhill Training College.

¹⁵ Though all the echinoids have been bunched together as *esculentus* I believe several species are included. Perhaps the most outstanding of these is a small brownish form, with comparatively huge spines, and very different from a small *esculentus* of about the same size. Among the larger forms are two which differ considerably from the normal *esculentus*. Of these one is pale in colour, has fewer primary tubercles, and a wider apical area than the normal form, whilst the apical plates are pierced by two or three pores. The other, which is almost as abundant in this area as the normal form, is much redder and taller, and has much fewer spines in the upper region. Typical

sizes of these last two forms are 102·4 mm. by 59·2 mm. and 70·4 mm. by 60·8 mm. respectively, as against 67·2 mm. by 86·4 mm. for the normal form.*

¹⁶ One only; very small— $1\frac{1}{2}$ inches long.

That this list is far from complete, even as regards the material so far to hand, is fully realised, but it has been deemed expedient to publish it, in the hope that experts on the various groups may volunteer to work over some of the material, correct mistakes, and fill up gaps, and that others may be induced to undertake the intensive study of some group or other.

Memorial Notice of the late Edgar A. Smith, F.Z.S., I.S.O.

By REV. G. A. FRANK KNIGHT, M.A., F.R.S.E.

[Read 28th November, 1916.]

EDGAR ALBERT SMITH, who passed away on 22nd July, 1916, was one of the most distinguished of British conchologists. His father was the late Mr. Frederick Smith, a well-known entomologist, and Assistant Keeper of Zoology in the British Museum, Bloomsbury, and author of several catalogues of British Hymenoptera.

Mr. Smith was born on 29th November, 1847, and twenty years later, in 1867, he entered the British Museum as one of the permanent staff. He became an Assistant Keeper of the Zoological Department in 1895, and finally retired in

* Since the reading of this paper further work has proved the small brown Echini to be young individuals of *esculentus*, while Dr. Bell has referred all the large forms to this species. I venture to think, however, that the more conical form, if not a distinct species, is at least worthy of a distinguishing varietal name, and, in view of its characteristics, I suggest that it might be called *E. esculentus* var. *acutiformis*.

1913, under the age limit, after nearly 46 years' service. His earlier work at the Museum comprised the arranging of the immense collection of shells obtained by the late Mr. Hugh Cuming, that enthusiastic conchologist who, in order to prosecute his molluscan researches, spent many years in his own yacht cruising about the Pacific, Indian, and Atlantic Oceans, from 1826 onwards, until he had accumulated an enormous store of material. When, on the urgent representations of the late Sir Richard Owen, the Trustees of the British Museum, in 1866, bought the Cuming collection of shells for £6,000, it fell to young Smith to classify and arrange the 60,000 specimens thus acquired, comprising about 19,000 species and varieties of shells. This was a herculean task, involving infinite patience and plodding industry. But his skill and thoroughness triumphed over every difficulty, and the splendid conchological department in the British Museum to-day is a monument to his zeal and scientific accuracy. The collection there is unequalled, and is not even approached, by any other museum in the world.

When the Bloomsbury premises were exchanged for the spacious Natural History Buildings at South Kensington the labour of transferring the shell collections to their new home entailed much thought and care. But all was successfully accomplished under Mr. Smith's organising genius. In his new premises Mr. Smith set himself the task of making the molluscan department a model for all other museums, and in this he amply succeeded. While most of his day's work was necessarily taken up with administrative duties, he found time to publish some 300 separate memoirs on the Mollusca, and a few dealing with the Echinodermata; all of them characterised by that lucidity, conciseness, and unflinching accuracy which were features of all his work.

When the *Challenger* expedition brought home its rich stores, the task of working out the *Pelecypoda* was entrusted to Mr. Smith, and his careful monograph on these shells may be read in the *Challenger Reports* now in the Library of this Society. Scores of scientific expeditions in all parts of the

world sent in their boxes of specimens to him for verification and classification, and months were spent by him in the preparation of elaborate reports on these collections. It was he who was largely responsible for the sending out of the two expeditions to Central Africa to study the molluscan peculiarities of Lake Tanganyika, and, while he personally disagreed with the theory of the leader of the expeditions—Mr. J. E. S. Moore—who regarded the extraordinary conchological species of that lake as a marine-relic-fauna from Jurassic times, Mr. Smith nevertheless did much to elucidate the past geological history of the African continent by interpreting the lessons read to science by its shells.

Mr. Smith was a Fellow of the Zoological Society of London, a Corresponding Member of the Linnean Society of New South Wales and of the Academy of Natural Sciences of Philadelphia. He was elected a Corresponding Member of the Natural History Society of Glasgow in 1888. The only paper contributed by him to this Society which I have been able to trace is "Notes on *Gasteropteron Meckelii*, Kosse," in *Trans.* iii. (N.S.), 1892, p. 258. but many of those interested in conchology have had reason to be grateful to him for his valued help afforded in the identification of species, and for kindly readiness to give information in every possible way.

Mr. Smith held for a time the office of President of the Conchological Society of Great Britain and Ireland, and he was also one of the founders, and latterly the President, of the Malacological Society of London, being also the Editor of the *Proceedings* of the latter Society at the time of his death. For his long and meritorious services to science he was decorated during King Edward's reign with the Imperial Service Order.

After his retirement in 1913 he continued to give much valuable voluntary assistance in the department which had been his life's sphere of activity until the state of his health made it necessary to discontinue the work. He passed away at his residence in Acton in his 69th year, leaving a memory

as one of Britain's greatest scientific administrators. Dr. S. F. Harmer, the present Keeper of Zoology in the British Museum, in a letter to me, speaking of Mr. Smith's decease, remarked: "When he died there was no past or present member of the staff whose loss would have been more regretted."

Desmids of the Clyde Area: New Records.

By Rev. CHARLES A. HALL, F.R.M.S.

[Read 28th November, 1916.]

IN "The Fauna and Flora of the Clyde Area," published in 1901, in connection with the meeting of the British Association in Glasgow in that year, some 135 Desmids were recorded as occurring in the Clyde Area. On 23rd June, 1908, Mr. R. Garry, B.Sc., exhibited before the Society 2 species not included in the 1901 list, viz., *Spirotaenia condensata* (Bréb.) and *Desmidiium Swartzii* (Ag.). On 4th October, 1910, Mr. George Lunam presented a paper to the Society, entitled "Some Additions to the Fresh-water Algæ of the Clyde Area"; and in his list he gave records of 7 species of Desmids, 5 of which do not appear in the 1901 list. One of these, *Desmidiium Swartzii*, had, as we have noted, been already found by Mr. Garry, his locality being the Golf Course, Milngavie. Mr. Lunam's record of this species was in Bute. I would add that I have found the species in abundance near Paisley, and also at Rahane and Stroul, Dunbartonshire. The remaining 4 new records included in Mr. Lunam's list were *Pleurotaenium Ehrenbergii* (Bréb.), *Euastrum videntatum* (Näg.), *Cosmarium Meneghinii* (Bréb.) f. *octangularis*, and *Staurastrum dejectum* (Bréb.). As far as I can ascertain, these records made by Messrs. Garry and Lunam are the only ones which have been published in association with the Clyde Area since the British Association list of 1901.

My own inquiries lead me to the conclusion that the Desmid flora of our Area is extremely rich, and it provides a field for research which may yield numerous new records. It would seem that the field has not received due attention on account of the difficulty of the satisfactory identification of species. We may hope for better attention in the near future, for the prime difficulty has been removed through the publication by the Ray Society of "A Monograph of the British Desmidiaceæ," by W. West and Prof. G. S. West. Four volumes of this monumental work have already appeared, and I understand that the two volumes which will complete the work are in preparation. It is regrettable that Mr. Wm. West, F.L.S., should have died while this work was in progress. The volumes of the "Monograph" already to hand are marked by the greatest care and definition, both as to text and illustrations, and they render the task of the identification of the species which come within their scope comparatively easy.

According to particulars noted by Messrs. West in their preface to the "Monograph," the total number of Desmids known in the world in 1839 was about 90 species; by 1861, the number of known species had increased to about 300; by 1889, to about 1,200; and in 1902, to 2,000. Messrs. West also state that the number of British species now known is approximately 690, and in their work they figure about 690 species and 450 varieties. This constitutes a great advance on any previous work. Hassall described and figured 68 Desmids in his "History of British Fresh-water Algæ," published in 1845. Ralfs, in 1848, published his "British Desmidiaceæ," figuring and describing 162 species and 32 varieties. M. C. Cooke, whose "British Desmids" appeared in 1887, described therein, and in a supplement, 290 species and 48 varieties. Cooke's work is, in some respects, very unsatisfactory.

During the past year, from April to October, I have devoted practically all my leisure to the examination of gatherings of Desmids from the Clyde Area, and the following list of what appear to me to be new records will give some idea of what may be in store for any investigator who may decide to prosecute inquiry in a determined manner. Ability to identify the species

mentioned is entirely due to Messrs. West's "Monograph," and I may say that I have set down no record of which I am not absolutely sure. In each case I have made careful *camera-lucida* drawings, and also measurements by means of stage-micrometer and *camera-lucida*.

Family: Desmidiaceæ.

SUB-FAMILY: SACCODERMÆ. TRIBE: SPIROTÆNIÆ.

Cylindrocystis displora (Lund.).—Barremman, Dunbartonshire.
Netrium oblongum, var. *cylindricum* (West and G. S. West).—Barremman; Rosneath; Arrochar.

SUB-FAMILY: PLACODERMÆ. TRIBE: PENIÆ.

Penium Libellula, var. *interruptum* (West and G. S. West).—Ardlui.

P. granulatum (Benn.).—Mambeg. The only record given by Messrs. West is Mawgan, Cornwall.

P. curtum, var. *obtusum* (West and G. S. West).—Mambeg. Messrs. West give no Scottish record, and the only English one given is Ingleton, W. Yorks.

TRIBE: CLOSTERIÆ.

Roya obtusa, var. *montana* (West and G. S. West).—Arrochar. Messrs. West state there are only three described species of *Roya*, all of which are rare British Desmids. In my gathering from Arrochar there were quite a number of specimens. My measured specimen showed length between poles 60μ , and breadth 6μ . Messrs. West also say this variety is more frequently met with in abundance than the typical form. They give no Scottish records.

Closterium costatum (Corda).—Rahane.

C. juncidum (Ralfs).—Barremman; Mambeg.

C. juncidum, var. *elongatum* (Roy and Biss).—Barremman. Messrs. West say, "We have never seen this variety from any parts of the British Islands, although Roy appears to have found it frequently in Scotland."

C. parvulum (Näg.).—Rahane.

C. parvulum, var. *angustatum* (West and G. S. West).—Mambeg. Length between apices $98\ \mu$, breadth $7\ \mu$. Messrs. West give no Scottish records, and only Pilmoor, N. Yorks, in England.

C. moniliferum (Bory) Ehrenb.—Rahane; Arrochar.

C. Siliqua (West and G. S. West).—Arrochar. Length of measured specimen $209\ \mu$, breadth $24\ \mu$. I have no doubt as to the identity of my specimens; they were found in a tub of stagnant water. Messrs. West give no Scottish records.

C. abruptum (West).—Arrochar.

C. Pritchardianum (Arch.).—Stroul.

C. subulatum (Kutz.) Bréb.).—Rahane.

C. lineatum (Ehrenb.).—Rosneath.

C. decorum (Bréb.).—Rahane.* Messrs. West say, "*C. decorum* is a very rare British species." Of British records the Scottish are most numerous.

C. rostratum (Ehrenb.).—Rahane; Trossachs.

TRIBE: COSMARIÆ.

Pleurotænium truncatum (Bréb.) Näg.).—Stroul.

Tetmemorus lævis (Kutz.) Ralfs.).—Barremman.

Micrasterias denticulata (Bréb.).—Stroul.

Cosmarium notabile (Bréb.).—Rosneath.

C. Brebissonii (Menegh.).—Rahane.

C. conspersum, var. *latum* (Bréb.).—Stroul.

Xanthidium antilopæum, var. *triquetrum* (Lund.).—Ardlui.

It will be observed that the foregoing list includes 18 species and 8 varieties of Desmids not contained in the British Association (1901) list, and these are additional to the 6 records mentioned as being made by Messrs. Garry and Lunam. The number of Desmids now recorded for the Clyde Area reaches 167.

Mr. Garry's record of *Spirotænium condensata* at Balmaha is confirmed by further records—one by Mr. Peter Goodfellow from the moor above Helensburgh, and one by myself at Rahane.

I append a somewhat varied list of Desmids identified in a small gathering from Rannoch, supplied to me by Mr. John Rennie, Helensburgh:—

* Again recorded on moor above Clynder.

Netrium interruptum.

Penium navicula.

Closterium angustatum.

C. intermedium.

C. Ulna.

C. juncidum.

Tetmemorus granulatus.

Euastrum humerosum (Ralfs). Messrs. West say, "*E. humerosum* is the rarest of the larger British species of *Euastrum*."

E. ansatum.

Micrasterias denticulata.

Xanthidium subhastiferum var. *Murrayi* (West and G. S. West).

Additional Records.

[9th January, 1920.]

Since the foregoing paper was read I have steadily investigated the Desmidiaceæ of the Clyde Area, with the result that I am able to append a further list of records: this I do at the request of the Editor. The nomenclature is that employed by Messrs. West in their "Monograph."

SUB-FAMILY: SACCODERMÆ. TRIBE: GONATOZYGÆ.

Gonatozygon Brebissonii.—Rahane.

TRIBE: SPIROTÆNIÆ.

Spirotœnia obscura.—Rahane.

S. minuta.—Whistlefield.

Mesotœnium violascens.—Barremman; Whistlefield.

M. purpureum.—Whistlefield and Tarbet.

Netrium digitus, var. *constrictum*.—Stroul; Garelochhead.

SUB-FAMILY: PLACODERMÆ. TRIBE: PENIÆ.

Penium cylindrus.—Whistlefield.

P. minutum.—Rahane.

TRIBE: CLOSTERIÆ.

Closterium didymotocum.—Barremman.

C. intermedium, var. *hibernicum*.—Rahane.

C. Dianæ.—Rahane.

C. Malinvernianum.—Gleniffer, Renfrewshire.

C. Lunula.—Barremman; Whistlefield.

C. Siliqua, var. *robustum* (C. A. Hall).—Rahane. This variety is distinguished from the type by its larger size, more robust habit, and the brownish-yellow colour of the cell-wall. The existence of a "girdle-band" has also been demonstrated.

C. Cornu.—Rahane.

C. gracile.—Barremman.

C. rostratum, var. *brevirostratum*.—Clynder; Gleniffer.

TRIBE: COSMARIEÆ.

Pleurotænum coronatum, var. *nodulosum*.—Barremman.

P. Ehrenbergii, var. *granulatum*.—Barremman.

Tetmemorus Brebissonii, var. *minor*.—Kilcreggan; Whistlefield.

Euastrum sinuosum.—Whistlefield.

E. ansatum.—Barremman; Whistlefield.

Micrasterias truncata.—Whistlefield; Garelochhead.

Xanthidium armatum.—Whistlefield.

With the addition of the above list, the number of species and varieties of Desmids recorded in the Clyde Area reaches 192.

I shall be glad to examine and report on any collection submitted to me if addressed to Woodburn, Clynder.

Helicigona arbustorum (Linné) var. *bifasciata* Kew.

A New Record for Scotland.

By Rev. G. A. FRANK KNIGHT, M.A., F.R.S.E.

[Read 28th November, 1916.]

Helicigona arbustorum was first noticed and described by Dr. Martin Lister, Linnæus' famous predecessor in the science of conchology. On account of the great variability of the species numerous names have been bestowed upon it, the generic title varying from *Helix*, *Cochlea*, *Arianta*, *Cingulifera*, to its final resting-place under the name *Helicigona*, established by Pilsbry in the *Manual of Conchology* in 1894.

Pennant, in 1777, called the species *Helix rufescens*, but the late Mr. Edgar A. Smith, F.Z.S., of the British Museum, discovered that the type-specimen of *Helix rufescens* of Pennant is not the species to which that name is usually allocated, but is a young shell of *Helicigona arbustorum*.

The normal shell is usually somewhat globular, but more convex above than below, of a rich brownish colour, freckled with opaque yellowish or reddish markings, and with a *single* dark brown supra-peripheral band encircling each whorl: it is also strongly and sometimes irregularly sculptured by the lines of growth, and finely and closely striate or incised in a spiral direction: the whorls number 5 to 6, being convex, and without evidence of a keel.

It is a very hardy species, enduring great cold, one variety reaching a height of 9,000 feet in Northern Italy. It is more nocturnal in habit than *Helix nemoralis* or *H. hortensis*, and frequents moist and shady woods, as well as riverside meadows, particularly among willows and alders, where the soil is black and boggy, but is specially attached to hedgerows fringed with succulent herbage, nettle beds, or damp ditches overgrown with ivy, coltsfoot, and other plants. It is very responsive to moisture, and is most frequently found on the shady sides of hedgerows and woods, and crawls freely about on warm damp mornings after copious dews, or after a heavy fall of rain. It is a very local and gregarious species.

Geologically, its presence has been traced back as far as the Lower Pliocene beds of Austria and Germany and the Upper Pliocene deposits of East Anglia.

Its liability to variation has given rise to a very large number of varieties and sub-varieties, the modifications being observable in shape, size, thickness, colour, banding, &c. In connection with the last-named peculiarity, the type, as I have stated, has only *one* band encircling the whorls. But the variety *fasciata* has one or more darker spiral bands, and according to their number the shells are named sub-vars. *bifasciata*, *trifasciata*, *tetrafasciata*, and *quinquefasciata*.

The specimen I exhibit is of the sub-var. *bifasciata*; it resembles the type, but has two bands, one normally placed, the other midway between it and the suture.

Hitherto the localities known for this var. *bifasciata* are exceedingly few. Mr. C. E. Wright recorded one from Kettering, in Northamptonshire; Mr. F. W. Wilson discovered one on the roadside at Aysgarth, in York, N.W.; Mr. J. F. Musham found a specimen at Barlby Bank, near Selby, in York, S.E.; and a specimen from Barnard Castle, Durham, is in the Rimmer Collection in the Edinburgh Museum. These are all the known English, and even all the known British, localities; but in Switzerland, at Gams, near Werdenberg, Canton St. Gall, Dr. Hartmann discovered a two-banded specimen.

The records for its occurrence being thus so few, it is a pleasure to be able to exhibit to this Society the first specimen found on Scottish soil. I found it last year in the limestone island of Lismore, on a grassy bank at the side of the road which runs from north to south through the island, at a spot close beside Killandrist House. The specimen was identified for me by Mr. W. Denison Roebuck, F.L.S., as being 00340 of the sub-var. *bifasciata*.

Notes on *Crania anomala* (Müll.).

By RONALD T. GRANT, M.B., CH.B.

[Read 24th June, 1913.]

Mr. Ronald T. Grant, introduced by Dr. J. F. Gemmill, gave a paper on the Brachiopod *Crania anomala* (Müll.).

Referring to previous work on *Crania*, Mr. Grant said that, while a good deal had already been done, the original results were not easily accessible to workers, and the data published by different authors were in some respects contradictory, and in others still requiring confirmation.

He proceeded to give a brief description of the general anatomy of *Crania* illustrating it by various lantern slides, and from that he passed on to discuss several of the still-disputed points.

A heart and vascular system had been described by Hancock. Later, in 1886, their existence was denied by Joubin, but in 1892 they were again, and more fully, described by Blochmann. From the examination of a considerable number of specimens both by dissection and by serial sections, Mr. Grant said he had been able to trace a complete heart and vascular system in accordance with the data given by Blochmann. Also he was able to add further details as regards the termination of the vessels in the gonads, and he described a very complicated plexiform arrangement of the vessels in the peri-oesophageal region, as distinct from the other peri-oesophageal lacunæ.

With reference to the arm sinuses, they formed a close system of spaces entirely shut off from the general body cavity, the great arm sinuses on either side ending blindly, and the small arm sinuses joining together in a central sinus, which was not in communication with any of the spaces of the peri-oesophageal network, and which was finally obliterated posteriorily by the peritoneum closing down round the oesophagus.

Mr. Grant concluded by discussing the relations of the brachial muscle, which he described, contrary to Joubin's view, as a separate muscle. This he supported by experimental evidence and serial sections.

Several live specimens were shown from the Millport Biological Station, and a number of series of sections demonstrated.

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JOUBIN.—“L'Anatomie des Brachiopodes inarticulés.” *Arch. Zool. experiment.*, t. iv, 1886

BLOCHMANN.—“Untersuchungen über den Bau der Brachiopoden.” 1 *Crania anomala*. Jena, 1892.

Lanarkshire and Its Molluscan Fauna.

W. DENISON ROEBUCK, M.Sc., Leeds (*Honoris Causâ*),
F.L.S., F.R.P.S.L.

[Read 28th November, 1916].

LANARKSHIRE, although its lower or north-western angle is occupied by one of the most important seaports in the world, is essentially an inland area, and is one of the three counties in Scotland which have no coast-line whatever, the immediately adjoining counties of Peebles and Selkirk being the other two.

Physiographically considered, it would appear to be a naturally defined district, and, therefore, a suitable one for the close study of faunistic distribution in connection with environment. For it is a complete drainage area, the basin of a single river and its tributaries, and defined by the line of the watershed which they drain.

The 897 square miles (or 562,821 acres) of Clydesdale extend in altitude from at or very little above sea-level at Glasgow to about 2,400 feet on the hills of the southern border (2,403 feet at Green Lowther).

The *Naturalists' Map of Scotland*, published by my deeply-lamented old friend, John A. Harvie-Brown, of Dunipace, shows the surface to be mainly under cultivation, with a broad fringe of moorland, and patches of woodland here and there in the valley.

Scotland in general presents many problems of interest, inasmuch as various species in this part of Britain thin out and eventually disappear as we proceed northward.

The naturalists of Glasgow do not seem to have made a systematic investigation of the county as a whole, for with the exception of those here recorded for the Falls of Clyde,

near Lanark, all the localities herein included are within the immediate vicinity of Glasgow. Doubtless the attractions of the coast and the islands which are so easily accessible from Glasgow are responsible for drawing investigators westward.

The present paper is one of a series of authenticated lists which I am writing in my capacity of Honorary Recorder of the Conchological Society of Great Britain and Ireland, and is based upon the records in their record books. The object is to stimulate further investigation in areas interesting by reason of their geographical position or other cause.

The material upon which this paper is based has all passed under the eyes of the Referees of the Conchological Society, and has been contributed by about sixteen observers. Earliest in point of date are the examples collected so long ago as 1872, and in later years by the late David Robertson, LL.D., now preserved in the Kelvingrove Museum. In 1880 to 1886 Mr. Thomas Scott, LL.D., collected, and in 1880 Mr. William Nelson, of Leeds, had specimens sent him by his son Harry, who was then in Glasgow. In 1878 a few were gathered by Mr. Joseph Whitwham, of Huddersfield, and in 1885 a few by the Rev. Hilderic Friend. On the 23rd August, 1886, I myself had a day at Possil, and in September of the same year my friend, Mr. Baker Hudson, now Public Librarian at Middlesbrough, collected a few species at the Falls of Clyde.

During the same year we had examples from the late Mr. Alexander Somerville, B.Sc., F.L.S. In 1887 and the few years following, we saw numerous specimens from Mr. Alexander Shaw. About the same epoch we had examples from Mr. F. G. Binnie, and in 1891 some from Mr. H. Matthews, jun. In 1904 we had a consignment of slugs from Mr. N. B. Kinnear. Then a long interval until 1913, when by the kindness of Mr. James Paton, Superintendent, and Mr. Peter Macnair, F.R.S.E., F.G.S., the Curator of the Glasgow City Museum in Kelvingrove Park, we had the opportunity of seeing the whole of the mollusca contained in that institution, which included most of the records here credited to Dr. David

Robertson. This year I am indebted to Mr. William Rennie for a number of things from the Possil area, and more especially to the Rev. G. A. Frank Knight, M.A., F.R.S.E., for the inspection of a large number of shells collected by himself and by his uncle, the late Alexander Somerville, B.Sc., F.L.S. It is a decided advantage to be able to make the quantitative as well as qualitative study of collections that the kindness of Mr. Knight and the authorities of the Kelvingrove Museum enabled us to do. And it is an advantage to the Museum that it has in its possession the MSS. of the late Dr. D. Robertson. In this connection I may, perhaps, be pardoned for saying that when I was in Glasgow in 1913 I had hopes of finding material in the collection of the late Dr. Frew, preserved at the University, but these hopes were disappointed. There seem to be no data attached to the specimens, consequently the Frew collection is, for the purpose of study of distribution, to all intents and purposes non-existent.

As for the literature of the subject the mollusca of Lanarkshire are included in the following books and papers, but have never been the subject of special lists or papers:—

1867.—John Dougall, L. & F. W. Mollusca found within 10 miles of Glasgow. *Nat. Hist. Soc., Glasgow, Trans.*, vol. I, p. 188.

1876.—F. G. Binnie. *Fauna and Flora of the West of Scotland*.

1891.—W. Denison Roebuck. Census of Scottish L. & F. W. Mollusca in *Proc. R. Phys. Soc., Ed.*, vol. X, pp. 437-503.

1901.—Thomas Scott. The L. & F. W. Mollusca in *Fauna, Flora, and Geology of Clyde Area* (Brit. Assoc.).

Limax flavus.—Cadder Parish, one, young, 10th April, 1917 (Wm. Rennie).

Agriolimax agrestis.—Wilderness Wood, Cadder, one, var. *albida*, 23rd August, 1886 (W.D.R.). Near Uddingston, 25th June, 1889 (Alex. Shaw). Near Glasgow, same date

(Id.). Possil Marsh, 10th December, 1916, several var. *reticulata*, very small, under stones, same locality, 24th March, 1917, under stones, very young examples, very abundant, both of type and var. *reticulata*. Cadder Parish, 10th April, 1917, var. *reticulata* young, numerous (all by William Rennie).

Agriolimax laevis.—Possil Marsh, one, very small, under stone, 10th December, 1916 (William Rennie); same locality, 24th March, 1917, very young ones, numerous (Id.).

Arion ater.—Canal side, near Cadder Wilderness, two half-grown, type, 23rd August, 1886 (W.D.R.). Near Uddingston, 25th June, 1889, one, var. *alba* sub-var. *oculata*, half-grown, wholly white with the eyes black and fod-fringe yellow (Alex. Shaw). Possil Marsh, under stones, 24th March, 1917, very young, a few (William Rennie).

Arion subfuscus.—Wilderness Wood, Cadder, one adult, 23rd August, 1886 (W.D.R.) Blackwood Estate, Kirkmuirhill, type and var. *fuliginea*, 20th September, 1904 (N. B. Kinnear). Possil Marsh, 24th March, 1917, several under stones, very young (William Rennie). Cadder Parish, 10th April, 1917, var. *cinereofusca*, three, young (Id.).

Arion hortensis.—Possil Marsh, 23rd August, 1886, a few (W.D.R.). Blackwood Estate, Kirkmuirhill, 20th September, 1904 (N. B. Kinnear). Possil Marsh, 10th December, 1916, several, small, under stones; same locality, under stones, 24th March, 1917, a few adult and abundance of very young ones. Cadder Parish, 10th April, 1917, a few, young (all from William Rennie).

Arion circumscriptus.—Possil Marsh, 23rd August, 1886, one (W.D.R.). Blackwood Estate, Kirkmuirhill, 20th September, 1904 (N. B. Kinnear). Possil Marsh, under stones, 24th March, 1917, several very young (William Rennie). Cadder Parish, 10th April, 1917, a few, half-grown (Id.).

Arion intermedius.—Blackwood Estate, Kirkmuirhill, 20th September, 1904, var. *grisea* (N. B. Kinnear). Possil Marsh, under stones, 24th March, 1917, several, very young (William Rennie).

Vitrina pellucida.—Falls of Clyde, near Lanark, a few juv. (Baker Hudson, September, 1886). Near Blantyre, September, 1888 (Alex. Shaw). Blantyre, a few (G. A. Frank Knight, 10th November, 1916).

Hyalinia cellaria.—Glasgow (H. Nelson, April, 1880). Falls of Clyde, near Lanark (Baker Hudson, September, 1886). Near Blantyre, September, 1888 (Alex. Shaw). Blantyre Mill, numerous (G. A. Frank Knight, 10th November, 1916).

Hyalinia alliaria.—Near Blantyre, September, 1888 (Alex. Shaw). Blantyre Mill, numerous (G. A. Frank Knight, 10th November, 1916). Near Bothwell, two (Id.).

Hyalinia nitidula.—Near Blantyre, September, 1888 (Alex. Shaw). Near Summerston (Id., 23rd September, 1888). Var. *nitens*, Falls of Clyde, near Lanark (Baker Hudson, 25th May, 1886). Blantyre Mill, numerous (G. A. Frank Knight, 10th November, 1916).

Hyalinia radiatula.—Kenmuir Bank (F. G. Binnie, ante 1890).

Hyalinia crystallina.—Falls of Clyde, near Lanark, small form, a few (Baker Hudson, 25th August, 1886). Near Blantyre, small form, September, 1888 (Alex. Shaw). Blantyre Mill, a few (G. A. Frank Knight, 10th November, 1916).

Hyalinia fulva.—Near Blantyre, September, 1888 (Alex. Shaw). Hairmyres, 28th September, 1872, a few (David Robertson; Kelvingrove Museum). Blantyre, three (G. A. Frank Knight, 10th November, 1916).

Punctum pygmæum.—Hairmyres, 28th September, 1872, a few (David Robertson; Kelvingrove Museum).

Pyramidula rotundata.—Falls of Clyde, near Lanark (Baker Hudson, August, 1886). Near Summerston (Alex. Shaw, July, 1887). Near Blantyre, September, 1888 (Id.). Uddingston (Alex. Shaw, 25th June, 1889). Possil Marsh.

under fallen branch, not common (William Rennie, 8th November, 1916). Glasgow, several (G. A. Frank Knight, 10th November, 1916).

Helix nemoralis.—Near Summerston, one var. *rubella* 00000, not large, and two var. *libellula* 00000 (Alex. Shaw, July, 1887). Glasgow, two adult var. *carnea* 00000, and one adult var. *libellula* 00045, with the bands brown and softly though clearly defined (G. A. Frank Knight, 10th November, 1916).

Helix hortensis.—Stonehouse (Thomas Scott, August, 1886). Near Blantyre (Alex. Shaw, 21st September, 1888). Near Uddingston, three var. *lutea* 12345, two of them becoming (12345) at month; one var. *lutea* (123)45, becoming (123)(45) at month; one var. *lutea* (123)(45), becoming (12345) at month; one var. *lutea* 1(23)(45), becoming (12345) at month; one var. *lutea* (12)3(45), becoming (12345) at month; one var. *lutea* 1(23)45, becoming (123)(45) at month; three var. *lutea* 00000; and one var. *lutea* (12345); all (Alex. Shaw, 25th June, 1889). Stonehouse, 1879, formula not noted (Thomas Scott). Near Blantyre, one var. *lutea* 00000, and one var. *lutea* 12345 (Alex. Shaw, 22nd September, 1888). Falls of Clyde, near Lanark, one dead and another broken, August, 1886, formulæ not noted (Baker Hudson). Near Summerston, six var. *lutea* 00000, one var. *lutea* 00000 *minor*, one var. *lutea* 12345 *minor*, one var. *lutea* 12345, becoming 1(23)45 at month; one var. *lutea* 1(23)45; one var. *incarnata* 00000; and six var. *lutea* 00000 (Alex. Shaw, 12th June, 1889). Near Glasgow, var. *incarnata*, formula not noted (Robert Standen, ante 1890).

Helicigona arbustorum.—Glasgow (H. Nelson, April, 1880). Near Summerston, type and vars. *cincta*, *alpestris*, and aff. *poiretia* (Alex. Shaw, July, 1887). Summerston, coll. Alex. Shaw, 1887, several each of var. *fusca* + type and var. *fusca* + *cincta* (Robert Standen, 8th May, 1912). Near Uddingston, type and var. *alpestris* + aff. *fusca* (Alex. Shaw, 25th June, 1889).

Helicella caperata.—East Kilbride, 1883, very dark example (T. Scott).

Hygromia hispida.—Var. *concinna*, Glasgow (H. Nelson, April, 1880). Near Summerston (Alex. Shaw, July, 1887). Near Blantyre, September, 1888 (Id.). Var. *subrufa*, East Kilbride (T. Scott, August, 1886). Blantyre, var. *hispidosa*, numerous (G. A. Frank Knight, 10th November, 1916). Possil, var. *hispidosa*, numerous (Id.).

Hygromia fusca.—Falls of Clyde, September, 1887 (Baker Hudson). Possil Marsh, under bank of willows, &c., not common (William Rennie, 8th November, 1916).

Ena obscura.—Falls of Clyde, near Lanark (Baker Hudson, September, 1886). Blantyre Priory, one (G. A. Frank Knight, 10th November, 1916).

Pupa cylindracea.—Blantyre, several (G. A. Frank Knight, 10th November, 1916).

Vertigo pygmæa.—Hairmyres, 28th September, 1872, several (David Robertson; Kelvingrove Museum).

Clausilia bidentata.—Near Glasgow (H. Nelson, April, 1880). Falls of Clyde, near Lanark (Baker Hudson, 25th August, 1886). Ditto, September, 1887 (J. E. Somerville). Kelvinside, numerous (G. A. Frank Knight, 10th November, 1916).

Cochelicopa lubrica.—Canal-bank, Possil Marsh, one, 23rd August, 1886 (W.D.R.). Near Blantyre, September, 1888 (Alex. Shaw). Blantyre, several (G. A. Frank Knight, 10th November, 1916).

Succinea putris.—Possil Marsh (F. G. Binnie, 1890).

Subulina octona.—Glasgow, gardens of the University at Gilmohrhill, two ex.-coll., J. A. Hargreaves (J. Kidson Taylor, 15th November, 1913).

Carychium minimum.—Near Blantyre, September, 1888 (Alex. Shaw). Hairmyres, one or two, 28th September, 1872 (David Robertson; Kelvingrove Museum).

Limnæa stagnalis.—Possil, two (Alex. Somerville, January, 1886). Old quarry at Possil, 1882, numerous (T. Scott). Possil Marsh, 1888, adults numerous (Jas. Steel; Kelvingrove Museum). Lambhill, numerous fine adults, pale in colour, some with white cloudings (G. A. Frank Knight, 10th November, 1916).

Limnæa palustris.—Possil Marsh (T. Scott, August, 1886). Possil Marsh, numerous, small, in clayholes (G. A. Frank Knight, 10th November, 1916). Frankfield Loch, September, 1886, a few (Id.).

Limnæa truncatula.—River Clyde, above Rutherglen (Alex. Shaw, 19th September, 1887). Possil Marsh, adhering to stones, not common (William Rennie, 8th November, 1916).

Limnæa peregra.—Glasgow and Edinburgh Canal, December, 1878, four (Joseph Whitwham). Possil Marsh, numerous, 23rd August, 1886 (W.D.R.). River Kelvin, Summerston (Alex. Shaw, July, 1887). Hillhead (Id.). River Clyde, above Rutherglen, var. *ovata* (small) and var. aff. *lacustris* (Alex. Shaw, 19th September, 1887). Possil, one (Kelvingrove Museum, 5th May, 1913). Hairmyres, abundant (D. Robertson; Id.). Marsh between Uddingston and Fallside, roadside near bridge, 1882, one, juv. (David Robertson; Kelvingrove Museum). Near Blantyre, young, var. *ovata*, September, 1888 (Alex. Shaw, 21st September, 1888). Possil Marsh, very common (William Rennie, 8th November, 1916). Possil Marsh, three in clayholes (G. A. Frank Knight, 10th November, 1916). Lambhill, three (Id.).

Limnæa auricularia.—Glasgow, two (G. A. Frank Knight, 10th November, 1916).

Limnæa glabra.—Frankfield Loch, 1881 (T. Scott).

Limnæa glabra.—East Kilbride, numerous (G. A. Frank Knight, November, 1916).

Physa fontinalis.—Glasgow and Edinburgh Canal, December, 1878, a few (Joseph Whitwham). Possil Marsh, numerous, 23rd August, 1886 (W.D.R.). River Kelvin, Summerston (Alex. Shaw, July, 1887). River Clyde, above Rutherglen (Id., 19th September, 1887). Coatbridge Canal,

28th July, 1885, numerous (Hilderic Friend). Possil, a few, small (Kelvingrove Museum, 5th May, 1913). Possil Marsh, 1878, several, small (D. Robertson; Id.). Marsh between Uddingston and Fallside, roadside near bridge, 1882, a few small (Id.; Id.).

Planorbis albus.—Possil Marsh, abundant, coll., A. Brown (Kelvingrove Museum, 5th May, 1913). Possil Marsh, on underside of leaves of *Potamogeton*, very scarce (William Rennie, 8th November, 1916).

Planorbis crista.—Hogganfield, August, 1886, two senr. (Alex. Somerville).

Planorbis spirorbis.—Hairmyres, abundant, 28th September, 1872 (David Robertson; Kelvingrove Museum). Gartcosh, three, juv., 31st January, 1891 (H. Matthews, jun.).

Planorbis contortus.—Frankfield Loch, 1881 (T. Scott).

Ancylus fluviatilis.—Coatbridge, 28th July, 1885, several (Hilderic Friend). Forth and Clyde Canal, Possil, one (G. A. Frank Knight, 10th November, 1916).

Acroloxus lacustris.—Possil Marsh (F. G. Binnie, ante 1890).

Bythinia tentaculata.—Coatbridge Canal, 28th July, 1885, one operculum (Hilderic Friend). Possil, numerous (Kelvingrove Museum, 5th May, 1913). Marsh between Uddingston and Fallside, roadside near bridge, 1882, a few, juv. (David Robertson; Id.). Possil Marsh, found amongst algæ, *Fontinalis*, &c., not very common (William Rennie, 8th November, 1916). Forth and Clyde Canal, numerous (G. A. Frank Knight, 10th November, 1916). Pond in Botanic Gardens, Glasgow, several (Id.).

Valvata piscinalis.—Marsh between Uddingston and Fallside, roadside near bridge, 1882, a few (David Robertson; Kelvingrove Museum).

Valvata cristata.—Possil Marsh, 1882 (T. Scott). Marsh between Uddingston and Fallside, roadside near bridge, 1882, a few (David Robertson; Kelvingrove Museum).

Unio margaritifer.—River Clyde, near Cambuslang, 1880 (T. Scott). River Clyde, Glasgow (Robert Standen, ante

1890). River Clyde at Bothwell, two, one of them very large (A. Brown collection, Kelvingrove Museum, Glasgow, January, 1917).

The occurrence of this species—the fresh-water Pearl Mussel—is of considerable interest, and it is much to be desired that a detailed account of its occurrence in times past and present should be drawn up and published.

Sphærium corneum.—Possil Marsh, numerous, coll., Alfred Brown (Kelvingrove Museum, 5th May, 1913). Possil Marsh, 1878, numerous (David Robertson; Kelvingrove Museum). Marsh between Uddingston and Fallside, roadside near bridge, 1882, a few, small (Id.; Id.). Possil Marsh, very common (William Rennie, 8th November, 1916). Forth and Clyde Canal, numerous (G. A. Frank Knight, 10th November, 1916).

Sphærium lacustre.—Pond near Possil Marsh, numerous (David Robertson; Kelvingrove Museum, 5th May, 1913).

Pisidium fontinale.—Hairmyres, 28th September, 1872, a few (David Robertson; Kelvingrove Museum). Marsh between Uddingston and Fallside, roadside near bridge, 1882, numerous (Id.; Id.); clayholes, Kelvin, numerous (G. A. Frank Knight, 10th November, 1916).

Pisidium pusillum.—Possil, a few (Kelvingrove Museum, 5th May, 1913). Hairmyres, a few, 28th September, 1872 (D. Robertson; Kelvingrove Museum). Marsh between Uddingston and Fallside, roadside near bridge, 1882, numerous (Id.; Id.). Near Blantyre, September, 1888 (Alex. Shaw, 21st September, 1888); clayholes, Kelvin, 10th November, 1916 (G. A. Frank Knight).

Pisidium obtusale.—Possil Marsh, numerous (Alfred Brown; Kelvingrove Museum, 5th May, 1913).

Pisidium pulchellum.—Hairmyres, 28th September, 1872, a few (David Robertson; Kelvingrove Museum).

Pisidium milium.—Hairmyres, 28th September, 1872, a few (David Robertson; Kelvingrove Museum); clayholes, Kelvin, two, 10th November, 1916 (G. A. Frank Knight).

Pisidium henslowanum.—Clayholes, Kelvin, 10th November, 1916 (G. A. Frank Knight).

Dreissena polymorpha.—Forth and Clyde Canal, near Glasgow, 1882 (T. Scott). Union Canal, Glasgow (Royal Scottish Museum, Edinburgh, October, 1888).

This list contains 58 species, of which 8 are slugs, 23 land and 27 water shells—which, if no additions are made, represent a poor fauna. Of the deficiencies in the list, one is at once struck with the apparent fact that several of the common slugs which doubtless exist have never been recorded. The Great Slug (*L. maximus*) ought to be found without difficulty in cellars, outhouses, and farmyards, as it is partial to human habitations. The Tree Slug (*L. arborum*) is likely to be as common as it mostly is in Scotland, and the Marsh Slug should be looked for at Possil, or along the water's edge of the canal, in which places it will doubtless be accompanied by *Zonitoides nitidus*. The absence of *Helix aspersa* will no doubt be accounted for by the facts that Lanarkshire is an inland county, and that its lower end is filled up by immense urban areas unsuitable to the species. *Hygromia striolata* (*rufescens*), whose Scottish range is remarkably interesting, appears to be absent, as also do *Vallonia pulchella*, *Acanthinula aculeata*, *Hygromia granulata*, *Balea perversa*, the germs *Anodonta*, *Pisidium amnicum*, two species of *Unio*, several of *Planorbis* and of *Vertigo*; but possibly some of these will reward careful research.

[NOTE.—Since the reading of this paper, Mr. W. Denison Roebuck has passed away, to the great loss of conchological science. No man had done more than he to advance accurate topographical research in connection with the land and fresh water Mollusca of Great Britain and Ireland. He died suddenly on 15th February, 1919.]

NOTE.

The date (10th November, 1916) attached to the species discovered jointly by Mr. Somerville and Mr. Knight does not refer to the time of capture, but to the day when the consignment, gathered in many various years, was submitted to the Hon. Recorder, and verified by him.

In Memoriam : James Stirton, M.D., F.L.S.

By D. A. BOYD.

[Read 25th January, 1917.]

THE announcement of Dr. Stirton's death on 14th January, in the eighty-fourth year of his age, has been received with deep regret by a wide circle of friends.

Although a native of the East of Scotland, he resided in our city for nearly sixty years, during which lengthy period his varied interests found useful exercise in many widely different directions.

He was educated at the University of Edinburgh, where he attained considerable distinction in the mathematical classes. He took the degree of Doctor of Medicine in 1858, and soon afterwards came to Glasgow, where he acquired an extensive practice. His high attainments as a specialist in several branches of medical science were fully recognised by his professional brethren, as appears from the numerous official appointments which were bestowed upon him from time to time. In 1879 he was appointed Lecturer on Gynæcology in the Royal Infirmary at Glasgow, and for a number of years had charge of the wards in that institution specially devoted to diseases of women. In 1889 he became Professor of Midwifery in Anderson's College Medical School, which appointment he continued to hold for about fifteen years. As a prominent member of the Faculty of Physicians and Surgeons in Glasgow he frequently held office, and was often entrusted with special duties as an examiner to the board or as a visitor to medical institutions connected with the Faculty.

It is remarkable that, in spite of assiduous devotion to professional duties and the many calls which were necessarily made upon his time, he should have found sufficient leisure successfully to conduct researches in cryptogamic botany of a kind which involved much patient labour, delicate manipula-

tion of material, and close examination of minute specimens under the microscope. It is, perhaps, still more astonishing that investigations conducted under such circumstances should have resulted in discoveries so numerous and important as to attain for him a world-wide reputation. He was especially attracted to the study of bryology and lichenology, which up till his time had been much neglected in the West of Scotland. For many years his holidays were generally spent in exploring the lofty peaks and deep glens of the Grampians and other mountain ranges of Scotland, or in visiting the rocky shores of the western lochs and islands. It may be doubted whether any other botanist has ascended Ben Lawers more frequently or acquired as extensive a knowledge of the rarer mosses and lichens which grow on that wonderful mountain. Endowed with a remarkably retentive and ready memory, he also possessed exceptionally acute powers of observation which enabled him promptly to detect any unusual morphological features or structural peculiarities in the specimens that came under his notice. In the field his stores of knowledge often enabled him to afford welcome aid to beginners in surmounting the difficulties encountered at the initial stage of their studies. Among those who were thus encouraged by him, and who afterwards attained distinction for their own successful researches in bryology, were the late Mr. Alexander M^cKinlay and Mr. Peter Ewing, F.L.S.

In the course of his botanical work Dr. Stirton corresponded with the leading authorities on bryology and lichenology both in this country and on the continent. Many of the species and varieties discovered by him are described or referred to in the principal text-books.* At least three species of mosses† were named in his honour by his friend and correspondent, Professor W. P. Schimper, of Strassburg.

* In Leighton's *Lichen Flora of Great Britain, Ireland, and the Channel Islands* (Third Edition, 1879), more than fifty species and varieties, described by Dr. Stirton as new to science, are inserted on his authority, as are also the sole Scottish localities cited for various other forms.

† *Grimmia Stirtoni* Schp., *Zygodon Stirtoni* Schp., and *Bryum Stirtoni* Schp.

He was a member of various scientific institutions, including the Linnean Society of London, Botanical Society of Edinburgh, and Royal Philosophical Society of Glasgow. He was also President of the Glasgow Society of Field Naturalists, and took an active part in its meetings from its foundation in 1871 till its incorporation with our own Society eight years later. In view of the visit of the British Association to Glasgow in 1876, lists of the Fauna and Flora of Clydesdale and the West of Scotland were prepared under the auspices of the Field Naturalists' Society and issued in the form of a handbook of the natural history of the district. The lists of mosses and lichens were compiled by Dr. Stirton, who also contributed to the volume some valuable notes on the cryptogamic flora of the West of Scotland. When the annual conference of the Cryptogamic Society of Scotland was held at Glasgow in 1880, he presided over the various meetings and public exhibition of specimens held in connection therewith. Most of his contributions to lichenology, &c., were published in the *Transactions* of the above-mentioned societies or in the pages of the *Scottish Naturalist*, *Annals of Scottish Natural History*, *Grevillea*, and other scientific periodicals.

His connection with the Natural History Society of Glasgow extended over many years, during which he occasionally submitted specimens or contributed papers at the meetings. He also held the office of President for the usual triennial term. Although the weight of advancing age and pressure of professional duties have for some time prevented his frequent attendance, his appearance at the meetings was always welcomed, while his occasional notes on new or rare mosses, &c., continued in *The Glasgow Naturalist* until a very recent period, showed that his love for scientific research and zest for fresh discoveries remained practically unabated.

Dr. Stirton is survived by a family, to whom must be extended the sincere sympathy of the members of our Society in the great loss which they have sustained.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII., No. 5.]

[December, 1921.]

Trees and Shrubs in a Renfrewshire Garden.

By JOHN CAIRNS.

II.—SUMMER.

[Read 26th September, 1916.]

ON Saturday, 10th June, 1916, a party of fifteen visited Barochan, Bishopton. It may be recollected that on the occasion of the last excursion, on 18th September, 1915, Sir Charles Bine Renshaw made the suggestion that another visit should be made in June, when a great many more shrubs would be in flower; this may accordingly be looked upon as a continuation of the previous excursion, and the following list is therefore supplementary to the one published in *The Glasgow Naturalist*, Vol. VIII, No. 1, page 11. It must not, however, be regarded as complete.

Acer palmatum, Thunberg, the Japanese Maple. Several specimens of good varietal forms of this highly ornamental tree are growing well at Barochan. They exhibit a great diversity of form of leafage, and many of them are brilliantly coloured.

Acer pennsylvanicum, L., the Snake-bark Maple. This Maple is a native of Eastern North America, and was introduced to Britain in 1735. Not only is the foliage most distinctive in character, but the tree is rendered additionally

attractive by the manner in which the stem and younger branches are striped, making it a most striking tree, even when denuded of foliage in winter.

Akebia quinata, Decaisne. This twining shrub is growing against a wall at the stables. Its leaves are placed on long, slender petioles carrying five, sometimes three or four, palmately divided leaflets. Its fragrant flowers are on pendent axillary racemes, male and female being distinct, but produced on the same raceme. It is the large purple-coloured sepals which make the flower conspicuous. It was introduced to Britain in 1845 by Robert Fortune, who was collecting plants in China for the Royal Horticultural Society. It has since been found in Japan and Corea.

Aristolochia Sipho, L'Héritier, the Dutchman's Pipe. This vigorous climbing plant is growing in close proximity to the last-mentioned. Its curiously-formed yellow and purple-streaked flowers always attract attention, and bear, as its popular name indicates, a close resemblance to a Dutchman's pipe. The foliage is very ample, the individual leaves being heart-shaped, blunt-pointed, and often 8 to 10 inches long, and about the same in width.

Berberis ætnensis, Presl., the Mount Etna Barberry. A low-growing species, never more than about 2 feet high. Its flowers are yellow, in short racemes. The foliage is exceedingly attractive in autumn, and the scarlet-coloured stems of the plant render it conspicuous throughout the winter.

Berberis Hookeri, Lemaire, var. *viridis*. This variety has greenish-yellow flowers, and differs from the typical *B. Hookeri* in that the leaves are bright green on the under surface, whilst in the type they are glaucous white or downy.

Carpinus cordata, Blume. A native of Japan, introduced by Charles Maries, who was employed by James Veitch & Sons, nurserymen, of Chelsea, to collect plants for them in China and Japan during 1877 to 1879. Its leaves are much larger than those of the common Hornbeam, somewhat tapered at the apex, and heart shaped at the base.

Cercis Siliquastrum, L., the Judas Tree, is trained against a wall at the stables. The flowers, rosy purple in colour, are produced before the leaves are fully developed. The individual leaves are reniform in shape and glaucous-green in colour. It has been known in gardens in Britain for several hundreds of years, and is supposed to have been introduced from Southern Europe about 1596. It belongs to the natural order Leguminosæ.

Ceanothus Veitchianus, Hooker. One of the most beautiful of the genus, which includes at least a dozen species, besides numerous varieties. They are not generally hardy in this district, and are usually grown against a wall for protection. *C. Veitchianus* has bright blue flowers in dense heads, and we were fortunate to see it whilst in splendid condition.

Cladothamnus pyrolæflorus, Bongard. A low-growing deciduous shrub, belonging to the order Ericaceæ. Its flowers are yellow, with rose-coloured centres.

Clematis alpina, Miller. A climbing species, with bi-ternately divided leaves. It is the sepals of the flower, as in all species of clematis, which make it conspicuous. In this species they are four in number and pale blue in colour. According to Bean, it is a native of Northern Europe and Northern Asia, also of the mountains of Central and Southern Europe, and was introduced in 1792.

Clematis montana, Buchanan, var. *rubens*, Kuntze. A Chinese variety, introduced in 1900, by Ernest Henry Wilson, who, in that year, was collecting plants for James Veitch & Sons, of Chelsea. Its leaves resemble in form the well-known *C. montana*, but are somewhat purple in colour, and more downy. The flowers are soft rosy-red. It is certainly a splendid addition to our hardy climbing plants.

Cornus Nuttallii, Audubon. This species, although not considered to be quite hardy, has succeeded well at Barochan. It is a native of North America, and is one of the finest of the cornels. It is the whorl of bracts surrounding the flower

head which makes it conspicuous, forming a "flower" often 6 inches across. The individual bracts are broad and white, sometimes flushed with pink.

Cotoneaster acutifolia, Turczaninow. A Chinese species, of bushy habit, and with somewhat pendulous branches. Its white flowers are produced in small corymbs, followed by dark red berries.

Cotoneaster Lindleyi, Steudel. On the day of our visit this was in fine condition; its long and slender branches were bearing numerous corymbs of white flowers, which made it exceedingly attractive. It is a Himalayan species, and Bean ("Trees and Shrubs Hardy in the British Isles") states that, in gardens, it is often wrongly named *C. nummularia*.

Deutzia scabra, Thunberg, var. *flore pleno* (usually known in gardens as *D. crenata flore pleno*). One of the best flowering shrubs in cultivation; it attains a height of 8 to 10 feet, and the double white flowers, tinged with reddish purple, are exceedingly beautiful.

Enkianthus campanulatus, Nicholson. A beautiful Japanese shrub, introduced by Charles Maries in 1880. It is proving to be fairly hardy in Scotland, and is a welcome addition to our gardens. The flowers are in pendulous racemes. The individual flowers are bell-shaped, pale yellow towards the base, but becoming bright red at the apex. It was in full flower on the day of our visit, and was much admired.

Exochorda Alberti, Regel. Bean ("Trees and Shrubs Hardy in the British Isles") says this is a native of Turkestan, where it was discovered in the eastern part of Bokhara by Mr. Albert Regel, at altitudes of 4,000 to 6,000 feet. It was sent to Kew in 1881 from the Segrez Arboretum in France by M. Lavallée, under the name of *E. Korolkowi*. The genus belongs to the natural order Rosaceæ. This species has erect racemes of white flowers, about 1½ inches across, and the stamens are in five bundles of five each.

Escallonia Philippiana, Masters. A very distinct sub-evergreen species, with small obovate leaves, from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch long. Its pure white flowers, barely $\frac{1}{2}$ inch across, are produced in myriads, in leafy racemes, from June till August. This is one of the hardiest species in cultivation; it grows and flowers well even in close proximity to our city.

Fraxinus Ornus, L., the Manna Ash. This forms a handsome tree, and is the most ornamental species in cultivation. The leaves are not unlike those of the Common Ash, and its whitish flowers, in terminal and axillary panicles, make the tree very conspicuous in early summer.

Cistus ladaniferus, L., the Gum Cistus. A pretty but somewhat tender shrub, the stems and foliage of which are covered with a glutinous resin. The flowers are solitary, pure white, with a conspicuous purple blotch at the base of each petal. It was introduced from Spain in 1629.

Garrya elliptica, Douglas. A well-known evergreen shrub, the leaves of which resemble those of the Evergreen Oak. When trained against a wall it is very conspicuous in mid-winter on account of the pendulous pale greenish-grey catkins. It is dioecious, but the male plant is much more ornamental than the female.

Laburnum Adami, Kirchner, the Purple Laburnum. A graft hybrid between *L. vulgare* and *Cytisus purpureus*. This tree is of peculiar interest, as it not only exhibits flowers of the true hybrid, but also those of *L. vulgare* and *Cytisus purpureus* as well.

Lonicera alpigena, L., the Cherry Woodbine. A native of Central Europe, and has been cultivated in gardens since the sixteenth century. Its flowers are produced in pairs; in colour they are yellow, tinged with red, not unlike those of *L. Ledebourii*, but they appear earlier.

Lonicera Ledebourii, Eschscholtz. This well-known species was introduced from California in 1838. It is of robust

growth, and suitable for planting in a rough shrubbery or in poor soil, where finer subjects would not succeed well. Its flowers are deep orange-yellow, tinged with red, in pairs, on a downy, erect stalk, about 2 inches long; followed by black berries in late summer.

Lonicera pileata, Oliver. A native of China, where it was discovered by Dr. Henry, but introduced to Britain by Ernest Henry Wilson in 1900. According to Bean, it has but little flower-beauty, and is (as yet, at least) very shy in bearing fruit, but its neat habit and dark shining foliage are pleasing. It is a shrubby species of spreading or trailing habit.

Lonicera Xylosteum, L., the Fly Honeysuckle. A native of Europe and Northern Asia. Bean says it is found wild in S.E. England, where it may be a true native. Hooker states it is to be got in copses in Sussex, Hertfordshire, &c., naturalised. The small creamy-white flowers are not particularly ornamental, but the scarlet berries are showy in autumn.

Neillia capitata, Greene, the Western Nine Bark. (This is usually known in gardens as *Spiraea opulifolia*, var. *mollis*.) The leaves of this species are three-lobed and broadly ovate, not unlike those of the Hop. The flowers are white, in corymbs, succeeded by inflated seed vessels of a reddish-bronze colour.

Parrotia persica, C. A. Meyer. A native of Persia, but as yet seldom seen in gardens in Scotland. It is allied to the Hamamelis, and the foliage reminds one of that genus. The flowers are in clusters, and have no petals, but the brown bracts and crimson-tipped stamens form a somewhat uncommon and striking inflorescence. The orange, yellow, and crimson tints which the foliage assumes in autumn make it particularly attractive at that season. Sir Charles says that it, along with *Pyrus arbutifolia*, is glorious in autumn at Barochan.

Ptelea trifoliata, L., Hop Tree or Swamp Dogwood. A low-growing tree, with trifoliate leaves on long footstalks.

Flowers in corymbs, but of an unattractive dingy white colour; the fruit bears a resemblance to that of the Elm. This tree does not appear to be thriving at Barochan.

Photinia villosa, De Candolle. (Also known in gardens as *P. variabilis*.) A rosaceous shrub, native of Japan, China, and Corea. Flowers white, in corymbs, followed by fruit similar to that of the Hawthorn. The foliage becomes brilliant red in autumn.

Pyrus arbutifolia, L. fil. This attracted attention on account of its hawthorn-like flowers, which were abundant in small corymbs along the young branches. It is a North American species, and was introduced about 1700.

Prunus Amygdalus, Stokes, the Almond. This is one of the loveliest of early spring flowering trees. Its pale pink blossoms, which open before the foliage appears, are particularly attractive at that season of the year. It fruits freely almost every year at Barochan.

Rosa Moyesii, Hemsley and Wilson. A native of Western China, introduced to cultivation in 1903 by Ernest Henry Wilson. It is singularly beautiful in leaf, flower, and fruit. The flowers are single, 3 inches across, and brilliant dark red in colour; the beauty of the flower is further enhanced by the tuft of golden anthers. The plant at Barochan is trained on a wall, and is growing vigorously.

Shepherdia argentea, Nuttall. A conspicuous shrub on account of the silvery hue of its foliage. The leaves are opposite and lanceolate, and dotted over with rusty brown scales on the under surface.

Of Shrubby Spiræas there are a considerable number at Barochan. The following species were noted:—

Spiræa canescens, Don. The long and slender shoots of this species give the plant a distinctive appearance. Its white flowers, in small corymbs, are abundant during summer. It is a Himalayan species, introduced in 1837. (In the second

edition of the Hand List of the Trees and Shrubs at Kew 24 synonyms are given.)

Spiræa media, F. Schmidt. (Syn., *S. confusa*, Regel.) This forms an upright, branching bush; its pure white flowers, in long-stalked racemes, are very freely produced in early summer.

Spiræa bella, Sims. This has rose-coloured flowers, in spreading corymbs, during May and June. The red stems give the plant a distinctive character.

Spiræa discolor, Pursch. (Usually known in gardens as *S. aricefolia*, Smith.) One of the most handsome and distinct of the shrubby Spiræas; well-grown specimens frequently attain a height of 10 to 12 feet. Its flowers are small, yellowish-white in colour, in large, slender-stalked panicles, which are gracefully pendulous. When in flower in July and August it is an object of great beauty.

Spiræa salicifolia, L., the Willow-leaved Spiræa. An erect-growing species, from 3 to 6 feet high, with smooth branches, which spring, as a rule, directly from the ground. The flowers are rose-coloured, in short, erect panicles.

Spiræa Van Houttei, Zabel. Bean says this is a hybrid between *S. trilobata* and probably *S. cantoniensis*, raised by M. Billiard, a nurseryman at Fontenay-aux-Roses, near Paris. The plant observed at Barochan was growing, as an isolated specimen, on the rockery, where its gracefully arching stems, covered with a profusion of its pure white flowers, in small corymbs, rendered it conspicuously beautiful.

It was observed that the frost in November last had damaged quite a number of shrubs, and that *Azara microphylla*, *Buddleia globosa*, and *Phlomis fruticosa* had suffered very badly.

The weather throughout the afternoon was very fine, and added much to the success of the outing. Before leaving, the company was entertained to tea by Sir Charles and Lady Bine Renshaw.

Bird Notes from Possil Marsh.

JULY—DECEMBER, 1916.

By WILLIAM RENNIE.

 [Read 30th January, 1917.]

IN my last paper to the Society I dealt with the bird life of Possil Marsh during the first half of the year.* The notes that I now present deal with the life there during the second half, and this portion of the year has proved fully as interesting as the previous one. The new "Summer Time" enabled me to continue my evening observations for a longer period than formerly; but I was forced during the later months of the year, owing to the shortening of the day, to confine myself almost entirely to the week-ends. It is, indeed, gratifying to be able to say that, during the year, five new species have been added to the Possil Marsh list of birds.† Yet I feel confident that, when so many good things have been found recently but a short distance away, if the work was carried on in a systematic manner by other observers, the list could be further extended, especially amongst the Ducks, Waders, and Gulls.

The Willow Wrens, Whitethroats, Meadow Pipits, and Skylarks gradually ceased singing after the beginning of July, and young birds became more numerous. The same can hardly be said about the Sedge Warblers, as their song was fairly constant until near the end of the month; but the young ones became common much about the same time as the others. The Yellow Wagtails, already referred to, were to be seen with their brood. The Cuckoo was last seen about the middle of the month, but its notes were not heard after June. After having been fairly plentiful during the month, there was a marked decrease, in the last week, in the number of summer birds frequenting the Marsh. Sandmartins were

* *The Glasgow Naturalist*, Vol. VIII.† *Ibid.*, Vol. V.

observed to be increasing as the month closed. On the 30th a brood of Whinchats were flying about. This was much earlier than I have been accustomed to see them. The Cygnets were not seen after the end of June. The cause of their mysterious disappearance leaves me still puzzled. I have heard so many different rumours regarding their fate, one by one, at the Marsh and elsewhere, that I have given up all investigations, as these were only leading to endless speculations.

As usual, when the open wild bird season comes round in August, a very noticeable change takes place here. Coot, Waterhens, and waders are soon reduced in numbers, almost to a negative quantity. Summer birds now begin to show signs of departure. A pair of Wheatears were seen on the 13th, and a Common Sandpiper was seen on the 20th. Of the former this was the second appearance, and of the latter the first appearance, since the spring of the year. Sand Martins were not observed after the 17th, nor the Yellow Wagtail after the 19th. The Swifts may be said to have left the district on the 13th, as they were not seen after that date, till a pair of belated ones were observed on 10th September, which is exceedingly late. The notes of the Corncrake were last heard during the second week, and three broods of Whinchats were noted towards the end of the month. The Willow Wrens renewed their song about the 7th, but this renewal died away again towards the end of the month, when the birds themselves were reduced numerically. Sedge Warblers remained steady throughout the month. They seemed to have been more fortunate with their broods this year than formerly, as young birds were by no means scarce. It was quite apparent, all month, that the Swallows were gradually leaving us. Numbers of young birds were to be seen resting on the wires and being fed by their parents, and at the close of the month they became very scarce. With the ripening harvest the Finch family became common towards the end of the month, and played much havoc among the grain. The Corn Bunting was exceedingly conspicuous

amongst them, and about the same time the Tits came into the willows for the winter. The Lesser Redpoll may be said to have been constant till the beginning of December; although there never were many of them, I was always sure either to see or hear them amongst the willows. Two Linnets were observed on the 27th. Song Thrushes were very common during the last week. Neither the Lesser Blackbacked Gull nor the Little Grebe were observed again after the end of the month.

With reference to the departure of our summer migrants, many times during the month little bands of departing Willow Wrens, on their way southwards, came under my notice. But an incident on the evening of the 15th will make that day a red-letter one in my memory. I was taking my usual walk in and out amongst the willows, and I got into the northern group about eight o'clock. I suddenly found myself surrounded by small birds, chiefly Willow Wrens, whose numbers I could not estimate. I rested on the fallen branch of a willow, and there I enjoyed a treat in bird life. All around birds, which seemed quite regardless of my presence, as they came to within a foot of my shoulders, twittering with delight as they flitted amongst the willows. At one time there would be over seventy Willow Wrens and not less than a score of Sedge Warblers, and I counted fourteen Whitethroats. All were in beautiful plumage, especially the Willow Wrens. I remained at this spot for half an hour, by which time I had heard the last distant notes of the birds in this movement, as they had worked their way to the willows on the east side of the Marsh, leaving only an occasional Sedge Warbler or Willow Wren, individuals, perhaps, that had been there before the invasion. On going over to the eastern willows at a quarter to nine, I found that the little songsters had passed onwards. That was the last occasion on which I saw the Whitethroat. That same evening, before nine o'clock, Swallows began to make their presence known by their merry twitter. They kept flying fairly high, their numbers gradually increasing; but I could not make out from

which direction they came. Just after nine there would be well over a hundred; these, bunched together, took their last wheel round the Marsh, then departed south-east. It is thus our summer migrants depart from us observed by few.

At the beginning of September Skylarks were by no means plentiful; but before the end of the month they had become very numerous, and several of them were attempting song. A Robin was heard singing on the 3rd, and was seen frequently afterwards. A Heron was observed in its usual corner on the 3rd and 10th. My first autumnal flock of Golden Plovers was seen on the 3rd. Some Curlews were seen a few days later, as were also some Redshanks and Snipe. Willow Wrens and Sedge Warblers gradually became very scarce towards the close of the month. The Willow Wrens seemed all to have left about the 24th. There were still a few young Whinchats, some Swallows, and an occasional House Martin. I have already referred to the Swifts. A pair of Hedge Sparrows were noted on the 24th, and on that date Meadow Pipits were plentiful, while there was also a noticeable increase in Reed Buntings.

October witnessed the departure of the last of our summer birds. My latest dates were:—House Martin on 1st, Sedge Warbler and Whinchat on 7th, and Swallows on the 15th. A Magpie was seen on the 1st, a covey of five Partridges was flushed from amongst the willows on the 15th, and four adult Grey Wagtails were noted on the 22nd. Meadow Pipits were very plentiful up till the middle of the month, when they were forced to seek pastures new on account of the heavy rains and flooding; but they had become quite common again before the end of the month. Skylarks, which were very plentiful, were singing tunefully all month. As regards the birds likely to be found at this time, a great deal depends on the nature of the crops in the vicinity. A potato field, after the crop has been lifted, supplies us with one of the best feeding grounds for waders and small birds. Naturalists were fortunate this year in having such a field adjoining the Marsh (part of which comes within the Marsh area *), and

* *The Glasgow Naturalist*, Vol. V, page 49.

great numbers of birds were seen. Naturally, amongst them was the Kestrel, for ever on the watch, and on several occasions he was observed fleeing before Meadow Pipits, Skylarks, Lapwings, Gulls, &c. An incident I saw on more than one occasion was the way the Black-headed Gull seemed to take a delight in persecuting the Golden Plover whenever the latter bird got a dainty morsel. This is just after the manner of the Skuas towards the Gulls. Sometimes the Plover got clear; but as often had to drop what it had found, only to have it greedily picked up by the Gull.

I experienced one of those little treats I often long for in the presence of a pair of those beautiful little birds, the Stonechats. A pair was seen on the 1st. I saw them together up till the 22nd. After that date only the male bird was to be seen, and I lost trace of him after the 12th November. On no occasion did I see them anywhere but along the side of the Marsh adjoining the canal, to which they seemed to confine themselves. Redwings were first noticed on the 22nd, when a flock of upwards of forty were seen, and a week later, on the 29th, Fieldfares appeared in great numbers. On several occasions aeroplanes have passed over the Marsh. The birds which regularly frequent this part pay very little attention to them now, except when they are flying very low and are noisy. The disturbance seems to last for a very short time. On the 29th one passed over the Marsh and Lochfaulds, flying low and noisily. The Gulls and Plovers cleared from the potato field, and did not return during the following hour. Skylarks were at the time plentiful, and singing delightfully. These stopped suddenly, and scattered; but they returned again, and became active within a quarter of an hour. But the most excited and scared birds of the lot were the Redwings and Fieldfares, and they were very numerous. They flocked and spread themselves broadcast, and kept up a continuous din. They settled down again when the aeroplane was well out of sight. Perhaps they have come from a land where the aeroplanes are

unknown to them, and this may have been their first acquaintance with them. I have not had another opportunity of finding out how they are behaving now.

November, with its blustery weather, provided excellent opportunities for one to be on guard in the event of anything turning up. Nor was the month disappointing. Beginning with the 5th, I found Missel Thrushes exceedingly plentiful at the Marsh and round about. This was their first appearance in numbers, but it lasted only for a day or two. That morning I had the rather unique experience of being able to see our five Thrushes together, but a few yards ahead of me. A male Goldfinch was seen at the outer edge of the willows. On the 12th a pair of Pochard and a Hedge Sparrow were noted. Up till then practically only the local pair of Swans was about, but that morning I saw a visiting pair attempting a landing. The resistance, however, from the local pair was too much for them. Coming again in greater numbers, the strangers eventually secured a landing, and within the next fortnight as many as fourteen were noted. However, these did not stay long, as the flooded lands further northwards proved a greater attraction for them, so the local pair remained practically alone up till the close of the year. On the 19th a perfect hurricane was blowing, causing birds to be scarce, and those that were seen difficult to observe. A Great Black-backed Gull was seen gliding through the storm, and quite a number of small waders were observed; but it was simply impossible to make out definitely what they were. I mentioned the fact to one of my friends, and two days later I received from him two Dunlins, thereby enabling me to place this species on the list. Previous to this they had been reported to me as "Sand Trippers with black legs."* Redwings and Fieldfares were exceedingly plentiful on the 26th, and there were also quite a number of Meadow Pipits. In addition to a few Lesser Redpolls that were amongst the willows, I observed a party of twenty-two flying from one

* *The Glasgow Naturalist*, Vol V, page 64.

clump of willows to the other. On the 30th a Goldcrest was limed. On several nights during the month the Tawny Owl was heard, and Ring Doves were fairly common at wheat sowing time.

The wintry weather of December, like that of the previous month, also provided good results. Three Bewick's Swans were seen on the 3rd by Messrs. Cumming and Hill. On the 10th I again had the good luck to find a Dipper. It is something of a coincidence to find the Dipper and Goldcrest again turning up within ten days of each other, as my last and only date for these birds was during stormy weather, when I recorded them on the morning of 20th November, 1911.* On the 17th, amongst some other waders, I observed a Ringed Plover; and on the 20th I again received from my friend a Dunlin and two Ringed Plovers. The latter, I am glad to say, is a further addition to the list of birds of the Marsh. My friend informs me that both birds have been seen in previous years at the Marsh, and at the present time were to be seen a little further to the north, a statement that others have been able to corroborate. The severity of the wintry weather was very intense during the week ending 24th, and that morning, when I visited the Marsh, I found it had been frozen over, but a rapid thaw had set in. Four Great Blackbacked Gulls were present, also several Ducks amongst the reeds. As many as thirty-eight Mallard took wing northwards. The whistling notes of the Widgeon were heard, but none was seen rising. A dead Cygnet could be seen embedded amongst the frozen vegetation. This is the second one observed this year. On the 31st bird life could not be termed plentiful, although quite a number of Meadow Pipits, a pair of Hedge Sparrows, and other small birds were present. I also noted a party of eleven Linnets. For the time of the year the weather was exceedingly mild, and it seemed as if it would have taken little to induce the Song Thrush and Skylark to resume song.

On the 14th of the present month (January, 1917) I was

* *The Glasgow Naturalist*, Vol. V, pages 52-53.

delighted to see a pair of Hooded Crows emerging from the reeds at the south end of the Marsh, and on mentioning this to a friend who knows the Marsh well, I was informed that the Grey Saddleback Crow had been frequenting the Marsh and district since Christmas. This is a notable addition to the list. Twites were numerous on that day, but have already been recorded in a former paper. Probably the severe weather on the hills had driven these birds down to the lowlands.

In drawing my notes on observations for the year 1916 to a close, I should like to say to the young student of field ornithology that it is not necessary at first to wander far and wide to become acquainted with our everyday birds. Let him map out a likely spot or area and get to work systematically, and at the end of the year he will be surprised at the number of birds that he has seen and become acquainted with. I may say that during the year 1916, from Possil Marsh alone, I have observed eighty species of birds, and there is still a lot of work left undone.

The Epidemic among Roach (*Leuciscus rutilus*, L.) on the Forth and Clyde Canal during the summer, 1916.

By JOHN RITCHIE, JUN.

[Read 30th January, 1917.]

THE following notice appeared in various local papers, and I have taken it as it appeared in the *Evening Citizen* (Glasgow) of July 21st, 1916:—

A FISH PARAGRAPH.

Hundreds of dead Roach are being found floating in the Forth and Clyde Canal in the Wyndford district. The idea of the fish having been poisoned finds little support, the area of water being too great. The fish are invariably covered with insects. Mr. John Adam, lock-keeper at Wyndford, Castlecary, will send a sample of the fish to anyone desiring to investigate the case.

I at once communicated with Mr. Adam, and on the 27th I received from him a Roach, nearly 8 inches long, which he had taken from the water in a dying condition. He also forwarded a bottle containing forty-nine of the so-called insects he had taken from it.

To outward appearance the fish lacked the lustre common to a healthy individual and was soft, it had lost some of its scales, and there was a large surface wound on its back, just anterior to the dorsal fin. The gills were white and the blood-vessels held no blood. On the body I found three ecto-parasites (similar to those in the bottle) which proved to be *Argulus foliaceus* (L.); one of these was in the right gill, while the other two had pushed themselves up under a scale at different places.

I then seared the body and made a ventral incision to reach the body cavity, and found that this contained a thick yellowish-brown fluid which seemed to be exuding from the liver, this latter organ being of a similar colour; microscopic examination of this fluid revealed two forms of bacteria similar to those found in bodies where decomposition has set in. One form was a micrococcus, the other a spirillum, and both were abundant, the muscles bordering the body cavity showed the same colouring on the inner surface, and smears showed the same bacteria.

Examination of the alimentary canal found it devoid of food, but attached to the wall of the intestine I obtained three Echinorhynchs. Several smears from the mucous membrane of the intestine gave no indication of any protozoal forms.

In August I again obtained from Mr. Adam a further lot of fish, consisting of five Roaches and one small Perch. None of these had the appearance presented by the fish I examined in July; there were no parasites, either external or internal, on or in any of the Roaches. An analysis of their stomach contents may be of interest:—

No. 1.—Hayseeds, grass, several fly larvae, and some culex.

No. 2.—Two wasps (undigested), capsule of earthworm, and an alga.

No. 3.—*Gammarus pulex*, *Ostracoda*, and *Daphnia* (several of each).

No. 4.—*Ostracoda*, fly larvae, and mayflies.

No. 5.—Hayseed, grass, docken seed, and other vegetable debris.

The stomach of the Perch was empty, but in the intestine I obtained three Echinorhynchs.

It was somewhat difficult to state, from the scantiness of the material, what the epidemic was due to, so I obtained the following particulars from Mr. Adam, who has been lock-keeper on this reach of the canal since 1884. He informed me that the epidemic broke out about the end of April, 1916; that, so far as he knew, this was the first case of the kind; that, since the war broke out, the section of the canal in which the epidemic occurred had not been much used for traffic; that Roach were the only fish affected, he never had noticed whether the fish were anæmic or not; and that at the beginning of August the epidemic was over; also, that he never before this had seen the insects which covered the fish during this epidemic.

I am of the belief that *Argulus foliaceus* (the so-called insect) was the principal cause of the epidemic; there may have been some cause or causes, such as temperature or some change in the water conditions previous to the epidemic, which had operated by favouring the multiplication of the fish-lice, and these attacking the Roach, which at that season were probably in their worst condition, the fish readily succumbed.

In their monograph on "British Parasitic Copepoda" (*Ray Soc.*), Messrs. Scott mention that this parasite was common on the Grayling of the Clyde, but that suddenly, after some heavy rain, they had all disappeared; it has also been known to have caused great damage among the fish of artificial ponds in France; while Maxwell, in his "Fresh-water Fishes," remarks that among the many enemies of the Roach it is peculiarly liable to the insidious attacks of external parasites.

There seems to be some doubt as to the frequency of this species, as I have elicited the information from several keen anglers that they never see fish-lice, others say these parasites are only seen during winter, while others affirm they are only to

be found in summer. On one occasion I was debating this matter with an angler who was fishing for Pike in the early days of July, 1915. He maintained that no fish-lice were ever seen on the fish during summer. Shortly after he landed a Pike, which, upon inspection, had an *Argulus* attached to the head.

Another point of interest which wants clearing up is the food supply of the fish-lice. It is generally supposed to be the mucus of the fish, yet I found fish blood corpuscles in two of the lice obtained from the Roach in July. The specimens in which this occurred were crushed between two glasses, and the blood may not have been within the crustacea, but only been an outer smear, as the entrance to the alimentary canal is of too small a diameter to admit the blood corpuscles of fish. Then again, I once took a free swimming specimen from Kilbirnie Loch which had to all appearance been feeding on some green vegetable food, probably an alga.

Another point wanting investigation is: Are there more than one species for these Islands? Messrs. Scott (cited above) only give one for Britain, and figure it. Their specimen does not resemble in all particulars any of the specimens I have obtained from different places. Neither does their figure of *Argulus foliaceus* correspond to that of Dr. E. Neresheimer (*Die Süßwasserfauna Deutschlands*, vol. 11.), who places the form of the swimfin or tail as the part of the body from which to make the distinction of species. All my specimens have the posterior of the swimfin rounded, while Messrs. Scott give theirs a sharp point—of course they mention the fact that they have had few opportunities of studying these forms.

These Crustaceans belong to an order that is very fertile, and there is the possibility that, given a favourable opportunity of reaching maturity, the *Argulus* may again cause an epidemic this year.

Proceedings of the Society.

26th September, 1916.

THE first meeting of the sixty-sixth session was held this evening, Mr. W. R. Baxter, President, in the chair.

The President read a memorial notice of the late Mr. J. A. Harvie-Brown, F.R.S.E., F.Z.S., M.B.O.U., &c., Dunipace, whose ornithological and other scientific work had earned for him European fame through his series of *Vertebrate Faunas* of various Counties. In 1901 he was elected an Honorary Member of the Society.

The President also read a memorial notice of the late Mr. George A. Herriot, who became a Member of the Society in 1896, and was well known as a keen botanist, and in recent years as an ardent photographer, whose beautiful lantern slides were an attractive feature at many of the Society's meetings.

Mr. F. C. Gardiner, Old Ballikinrain, Balfron, was elected an Ordinary Member.

Mr. John Cairns reported on the excursion to Barochan House on 10th June, 1916 (p. 145); Mr. John R. Lee on the alpine excursion to Cruach Ardran on 15th July, 1916 (p. 176); Mr. John Ritchie, Jun., on that to Beith on 26th August, 1916 (p. 177); and Mr. D. Macdonald on the visit to Langbank on 9th September, 1916 (p. 178).

Dr. T. F. Gilmour sent for exhibition a well-grown specimen of Chicory (*Cichorium Intybus*, L.) from Farkin, Port-Ellen, Islay—a new record for Vice-County 102. It was probably introduced with seed, and now it would seem to be fairly establishing itself.

Mr. John Main, F.G.S., exhibited fruiting branches of various species of the genera *Pinus*, *Picea*, *Abies*, *Thuja*, *Araucaria*, and *Eucalyptus*, along with a number of grasses from Castle-Kennedy, Wigtownshire.

Mr. Andrew Barclay, F.E.I.S., gave a very interesting lecture, entitled "Further Investigations into Disease-carrying by Insects." He was able to impart a large amount of definite information on the subject, particularly on the disease-propagating powers of the common House-Fly. Recent developments in the study of this topic were summarised and illustrated by lantern slides.

31st October, 1916.

The sixty-fifth Annual General Meeting was held on this date, Mr. W. R. Baxter, President, in the chair.

The Council reported that during the session eight Ordinary Members and one Associate were added to the roll. Through death the Society had lost the following members:—Mr. J. A. Harvie-Brown, F.R.S.E., F.Z.S., M.B.O.U., Honorary Member; Mr. William Phillips, F.L.S., Shrewsbury, and Sir Thomas Gibson-Carmichael, F.L.S., Dolphinton, Corresponding Members; and Messrs. Johnstone Shearer and George Herriot, Ordinary Members. The names of a number of members who could not be traced, and whose subscriptions were considerably in arrears, were removed from the roll, which thus stands at:—

Honorary Members, 14; Corresponding Members, 29; Annual Members, 159; Life Members, 21; Associate Members, 4; Total, 227.

The Hon. Treasurer (Mr. John Renwick) was absent through illness for the first time since his appointment 30 years ago. In his report he pointed out that the falling off in membership and in ordinary income is serious.

The Hon. Editor (Mr. John Paterson) reported on the state of the publications.

The following office-bearers were elected:—As Vice-President (one vacancy), Mr. Richard Elmhirst, F.L.S.; as Members of Council—Messrs. John Cairns, T. Thornton MacKeith, William J. M'Leod, and Thomas W. Wilson.

Messrs. Joseph Sommerville and James Jack were re-elected Auditors.

Mr. John R. Lee exhibited specimens of *Malaxis paludosa*, Sw., from Inverarnan, one of the rarer plants of our flora, of which only a few stations are known. Some interesting notes on the morphology of the plant were given.

Mr. J. J. F. X. King, F.E.S., exhibited *Megalomus hirtus*, L., of the Sub-order *Neuroptera-Planipennia*, a very rare Lace-Wing Fly, which he had taken at Muchalls, Kincardineshire, in July, 1916. A note was read from Professor J. W. H. Trail, F.R.S., Aberdeen University, stating that he also had obtained this species at Muchalls on 21st June, 1916, the identity of which had been established by Mr. R. M'Lachlan.

Mr. George Lunam exhibited a number of microscopic preparations of Blue-Green Algæ, principally of species concerned in the phenomenon of "water-bloom." He showed also a number of the commoner large species found on wet rocks.

Mr. Louis P. W. Renouf read a paper entitled "A Contribution to our Knowledge of the Fauna of the Clyde Sea Area" (see p. 113). The paper dealt with the area known as "The Ascog Patches"—two small areas of hard ground lying about 1,000 yards off Ascog on the eastern side of Bute. The average depth of water over the "patches" is about eight fathoms. So far about 130 species have been distinguished in the material dredged from the area, being distributed as follows:—Protozoa, 2; Porifera, 4; Cœlenterata, 20; Mollusca, 33; Vermes, 22; Polyzoa, 10; Crustacea, 20; Echinodermata, 15; Tunicata, 5; Pisces, 3. Mr. Renouf exhibited a number of specimens, and also a series of photographs of a two-headed *Metridium* in various stages.

28th November, 1916.

The third meeting of the sixty-sixth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Rev. G. A. Frank Knight, M.A., F.R.S.E., read a memorial notice of the late Mr. Edgar A. Smith, F.Z.S., I.S.O., one of the most distinguished of British conchologists, and a Corresponding Member of the Society since 1888 (see p. 119).

Mr. W. R. Baxter reported on the excursion to Balfron and the Endrick Water on 25th September, 1916 (see p. 178).

Rev. G. A. Frank Knight, M.A., F.R.S.E., exhibited a specimen of *Helicigona arbustorum* (L.), var. *bifasciata* Kew, from the Island of Lismore—a first record for Scotland. Only four previous British records, all from English counties, have been made for this land mollusc (see p. 127).

Rev. Chas. A. Hall, F.R.M.S., read a paper entitled "Desmids of the Clyde Area: New Records," in which particulars of 18 species and 8 varieties not previously recorded for "Clyde" were given (see p. 122).

Mr. W. Denison Roebuck, M.Sc., F.L.S., F.R.P.S.L., sent a paper, which was read by Mr. Alex. Ross, F.E.I.S., entitled "Lanarkshire and its Molluscan Fauna." The paper was one of a series of authenticated lists which the writer, in his capacity of Hon. Recorder of the Conchological Society of Great Britain and Ireland, is producing, the object being to stimulate further investigation in areas interesting by reason of their geographical position or other cause (see p. 131).

26th December, 1916.

The fourth meeting of the sixty-sixth session was held this evening, Mr. W. R. Baxter, President in the chair.

The President read a memorial notice, contributed by Mr. Charles Kirk, of the late Mr. George W. Stout, who had been a member of the Society since 1910. A keen student of bird life, Mr. Stout for some years was of great service to Scottish ornithology as the official recorder of rare and interesting species that came under his observation at Fair Isle, Shetland, where he was born in 1889. Dr. Eagle Clarke early dis-

covered in him a born naturalist. In 1909 he began to act as an assistant to Mr. Kirk in taxidermy, showing great skill in the art. In 1915 he enlisted in the R.A.M.C., and met his death in the Somme advance in July, 1916. Such was his natural aptitude for accurate observation, and so keen was his delight in his profession, that, had he been spared to come through the war, there is no doubt he would have obtained first rank as an ornithologist and a taxidermist.

Mr. H. R. J. Conacher, Horsewood Road, Bridge of Weir, was elected an Ordinary Member.

Mr. Charles Kirk sent for exhibition the following birds:— a Hoopoe, *Upupa epops*, L., from Monkton, Ayrshire; Leach's Fork-tailed Petrel, *Oceanodroma leucorhoa* (Vieillot), from Kilnarnock; a Storm-Petrel, *Procellaria pelagica*, L., from Fairlie. The last-named was found, by Mr. Neil Currie, dead on the shore about a month ago, after a gale from the south-west on the previous day.

Mr. W. R. Baxter exhibited eggs of the Storm-Petrel and of Leach's Petrel.

Mr. R. S. Wishart, M.A., sent for exhibition an "Ivy-Triangle," consisting of anastomosing branches of ivy; the Ploughman's Spikenard, *Inula Conyza*, DC., very abundant on the North Downs, and a striking object when it reaches the height of 4 or 5 feet; the Clover Dodder, *Cuscuta Trifolii*, Bab., the farmer's enemy, which sometimes destroys whole patches of clover; and the Smaller Broom-Rape, *Orobanche minor*, Sm.—all from West Malling, in the county of Kent.

Mr. W. M'Cutcheon, B.Sc., exhibited a number of Marine Shells from the Mediterranean.

Mr. John R. Lee exhibited and described a large series of lantern slides from the collection of the late Mr. George Herriot. The subjects were all of botanical interest, and consisted mainly of photographs of alpine species. The slides were of excellent technique, and of very great interest to the botanical members.

30th January, 1917.

The fifth meeting of the sixty-sixth session was held this evening, Mr. H. W. Wilson, Vice-President, in the chair.

The Chairman read a memorial notice, prepared by Mr. D. A. Boyd, of the late Dr. James Stirton, M.D., F.L.S., a cryptogamic botanist of European fame, and an ex-President of the Society (see p. 142).

Mr. John R. Lee exhibited specimens of *Heterocladium dimorphum*, B. and S., from Auchingaich Corrie, Dumbar-tonshire. This is one of our rarest species, and this appears to be the only record of it for the Clyde Area. The main morphological features were fully dealt with.

Mr. H. W. Wilson exhibited a large series of beautiful lantern slides under the title, "Birds and their Nests at Home and Abroad." The slides were the work of Mr. P. Webster, and were from photographs taken in various parts of the British Isles and on the Dutch coast.

Mr. William Rennie read a paper entitled "Bird Notes from Possil Marsh, July till December, 1916" (see p. 153).

Mr. John Ritchie, Jun., forwarded a paper on "The Epidemic among the Fish of the Forth and Clyde Canal in 1916," in which he stated that, having had his attention drawn to the subject by a notice in an evening newspaper in July 1916, he had made inquiry into the disease, and had obtained material from the lock-keeper at Wyndford. He discovered that the Roach taken in the canal were infected in great numbers with the parasite *Argulus foliaceus*. These parasites were probably the cause of the excessive mortality, as the Roach is peculiarly liable to succumb to the insidious attacks of such external foes (see p. 160).

27th February, 1917.

The sixth meeting of the sixty-sixth session was held this evening, Mr. Robert Garry, B.Sc., in the chair.

A letter was read from Mr. Robert Coates, intimating a gift of 25 volumes to the Society's Library.

Mr. William Vickers sent for exhibition a series of lantern slides to illustrate his paper (which was read by the Secretary) on "Bird-Nesting with the Camera." Notes on the structure of the nests, and the methods to secure protection thereof adopted by the birds, accompanied the excellent series of ornithological studies.

Mr. John Henderson sent for exhibition a number of autochromes giving very faithful renderings in colour of various garden flowers, and some exquisite winter scenes were also greatly admired.

Mr. N. Reid exhibited a large and fine series of slides of Ailsa Craig, illustrating the characteristic rock formation and its bird life.

Mr. G. Lunam exhibited a number of slides revealing the main features of the river scenery in Glen Falloch.

Mr. John Paterson called the attention of members to a recent record of extraordinary interest to ornithologists, viz., that Mr. J. R. M'Culloch had reported that he had observed near Knightswood the Black Redstart (*Ruticilla titys*). The bird is a very unfamiliar visitor, this being only its third reported occurrence in the Clyde area. Mr. Wordie saw it in 1905 in Great Western Road, and in 1915 Mr. Geo. Stout reported seeing one "near Glasgow." A number of other Scottish records have been made from lighthouses.

Mrs. Peter Ewing read a very interesting report on the recent meeting of the British Association, held this year at Newcastle, in which she dealt mainly with the work of the Botanical Section and the Conferences of Delegates of Associated Societies.

27th March, 1917.

The seventh meeting of the sixty-sixth session was held this evening, Mr. Alex. Ross, F.E.I.S., in the chair.

Mr. John Paterson exhibited a specimen of *Fomes populinus*, Fr., from Dripps, near Waterfoot, Lanarkshire. No previous record for this species within the Clyde Area has been made. The host is the Black Poplar, a tree that is not commonly planted in the Area.

Mr. John Main, F.G.S., sent for exhibition a large number of slides by Mr. Charles Reid, Wishaw. They consisted principally of views of the London Zoological Gardens, and of West of Scotland landscapes, with sheep as the main objects in the foreground.

Mr. Geo. Lunam exhibited a few slides of alpine plants from photographs taken on Ben Lawers and Ben Lui.

Mr. Andrew Barclay, F.E.I.S., read a paper entitled "Investigations and Observations in the Life and Habits of *Bipalium Kewense*." This land-inhabiting Flat Worm made its first appearance in 1905 in the hothouse of Ruchill Gardens: the latest specimen was obtained during this month. Twelve years' habitat in the same hothouse is a record outside Kew Gardens themselves. The worm reverses the usual order of "hibernating" animals in that it rests all summer and is active in winter. Its structure is such that sunshine or a dry atmosphere would prove fatal to its existence. Mr. Barclay exhibited a large living specimen (11 inches long), and its movements were shown by means of a prepared board. Its morphology, reproduction, and habits were fully dealt with, and illustrated by mounted specimens and by sketches.

24th April, 1917.

The eighth meeting of the sixty-sixth session was held this evening, Mr. W. R. Baxter, President, in the chair.

Mr. W. Jamieson reported on the excursion to Baldernock Linn and the "Auld Wives' Lifts," undertaken jointly with the Andersonian Naturalists' Society on 9th April, 1917 (see p. 180).

Mr. Peter Macnair, F.G.S., F.R.S.E., read a paper on the

geology of the Baldernock District and the origin of the "Auld Wives' Lifts." He said that the hilly ground forming Craigmaddie Muir consisted of a thick group of sandstones which lay above the volcanic rocks of the Campsie Hills and below the Carboniferous Limestone Series. He pointed out that the pebbles, mainly of white vein quartz, when examined under reflected light, showed several sets of parallel facets, due to the rejuvenation of the original crystals. Special attention was also directed to a bed of shells found in a stream section above Davans, near the top of the Hollybush Limestone. The bed is simply a mass of the brachiopod *Rhynchonella pleurodon*. Other beds of a similar kind were referred to as occurring in the district, and Mr. Macnair proceeded to discuss the question as to whether the existence of a species in such large numbers was indicative of its having reached its maximum, or whether it was about to become extinct. He said that the evidence afforded by the rocks in the Glasgow district was not sufficient to settle the question at present. An account was also given of the geological structure of Baldernock Linn, and it was maintained that the trilithon known as the "Auld Wives' Lifts" was of natural origin, the stones having been placed in their present position through ice action. The paper was illustrated by some very fine lantern slides.

Mr. John Renwick sent an interesting note dealing mainly with the traditions connected with the "Auld Wives' Lifts." One of these was that any unmarried person visiting the "Lifts" for the first time must creep through the passage between the stones in a direction from east to west, otherwise he or she will never be wedded. Hugh Macdonald, in his *Rambles Round Glasgow*, states that the visitor must crawl through in a direction "contrary to the direction of the sun," *i.e.*, from west to east. Mr. Renwick quoted the late Dr. C. Fred Pollock, a native of Baldernock, and familiar with the traditions of the neighbourhood, as maintaining that in this Macdonald was in error. In this view he was supported by Mr. James Bartholomew, Glenorchard, the proprietor of the

estate on which the "Lifts" are situated. The latter also stated a legend to the effect that one of the three witches was bringing a fourth and bigger stone, when her apron-string broke, and the stone fell, skinning her shins, so she let it lie. This stone was blasted up for building dykes by a former proprietor. It lay some distance to the north-west of the "Lifts." The "Lifts" are said to be the scene of witches' revels on Hallowe'en, and if any one visits the place at midnight alone on that night he will see something he won't forget. The statement is incorrect that the ground round the "Lifts" is paved or flagged with large stones, as probings with a stick have revealed the contrary. Nor are there now remaining any of the roots of oak trees which Ure stated were visible in 1793 when he described the spot. Mr. Renwick gave examples from other parts of the world of the widespread belief in the efficacy of passing through similar stone apertures, and also of the belief in the misfortunes which will dog the footsteps of any sacrilegious wretch who will dare to demolish or damage such "uncanny" structures.

Mr. Ludovic M. Mann gave an account of his archæological researches at the "Lifts," and exhibited a large scale plan of the stones and their surroundings to illustrate his descriptions.

Mr. John Neilson showed a number of slides of the "Lifts," and brought forward arguments to show that the blocks had been put in their present position by human agency.*

29th May, 1917.

The ninth meeting of the sixty-sixth session took place this evening, Mr. W. R. Baxter, President, in the chair.

Mr. Geo. Guthrie reported on the excursion to Possil and Cadder on 21st April, 1917 (see p. 183); Mr. D. Macdonald on that to Summerston and Bardowie Loch on 19th May,

*Mr. Neilson's paper has been published in *Trans. Geolog. Soc. Glasg.*, Vol. XVI., Pt. ii (1916-17).

1917 (p. 183); and Mr. J. J. F. X. King, F.E.S., on that to Hamilton High Parks and Barncluith on 22nd May, 1917 (p. 184).*

Mr. Peter Macnair, F.G.S., F.R.S.E., exhibited microscopic preparations of Calcareous Algæ from the Carboniferous Rocks of Scotland. An account was given of the general character of the flora of the Carboniferous Period. In particular the following species were described: *Girvanella problematica*, Gibs, from Girvan; *Mitcheldeania gregaria*, Nich., from Beith; and *Ortonella*, Sp., from Lesmahagow.

A selection of microscopic slides from the collection of the late Dr. C. Fred. Pollock was set out for the members' inspection.

Mr. John Paterson exhibited a specimen of *Ceterach officinarum*, Willd., the Scale Fern, from Shandon, naming also a few other stations whence this rare fern had been obtained. Mr. Paterson also exhibited a specimen of *Griselinia littoralis*, Raoul, from Row, a beautiful tree shrub which is a native of New Zealand.

Mr. John R. Lee exhibited a portion of a Birch that was found growing on the top of an old oak at Cadzow on the occasion of the Society's recent visit to Hamilton. Some of the decayed oak penetrated by the roots of the birch was also shown.

Mr. Lee further exhibited a specimen of *Reboulia hemisphærica*, Raddi, from near Duntocher. This uncommon Liverwort has been recorded in the Clyde district from only two localities. The present record is the first for Dumbartonshire.

Mr. John Paterson read a "Report on the Return of Summer Birds to the Clyde Area in 1917."

26th June, 1917.

The tenth meeting of the sixty-sixth session was held this evening, Mr. John R. Lee, Vice-President, in the chair.

Mr. Geo. Lunam read a report on the excursion to the Allander and Craigallian Loch on 16th June, 1917 (see p. 184), and Mr. G. H. Banks reported on the visit to the Botanic Gardens on 19th June, 1917 (see p. 185).

Mr. Charles Kirk sent for exhibition a specimen of the Hen-Harrier, *Circus cyaneus*, L., from Kilmarnock, and Mr. Alex. Ross, F.E.I.S., contributed some notes on the species.

Mr. J. Tannock sent for exhibition a specimen of *Ephialtes* sp., an Ichneumon taken at the Docks, Glasgow. Mr. J. J. F. X. King, F.E.S., set the specimen, and showed for comparison with it *Ephialtes manifestator*, L. Mr. Alex. Ross, F.E.I.S., described the main morphological features of the Ichneumons, and gave some interesting notes on their biological relationships.

Mr. Ross also exhibited specimens of *Leptis scolopacea*, L., the Snipe-Fly, from Auchinairn. This is a common fly with us, and predatory on smaller insects. The morphology of the insect, and its habits, especially its mode of capturing its prey and of alighting on tree trunks, etc., formed the subject of an intensely interesting address.

Mr. Geo. Lunam exhibited a Tadpole with a branched tail. The latter feature did not seem to be due to an accident, as a secondary branch was arising near the end of the primary one. The specimen was reared from spawn obtained at Possil Marsh.

Mr. John Paterson sent for exhibition a branch of *Acer monspessulanum*, L. The Montpellier Maple is a European species very little known in cultivation in this country. The specimen was got at Ardchapel, Shandon, from a tree 30 feet high, with a good canopy of spreading habit. It fruits freely, like so many other introduced Acers.

Mr. John R. Lee exhibited eight species of Mosses belonging to the genus *Fissidens*. He dealt very fully with the characteristic leaf-form of the genus, and gave the various theories that have been propounded to explain its significance. His remarks were illustrated with drawings and microscopic preparations.

Excursions.

CRUACH ARDRAN, 15th July, 1916.—Conductor, Mr. John R. Lee.—This excursion was arranged jointly with the Andersonian Naturalists' Society, and seven persons in all took part. The start was made from Crianlarich Station on arrival of the 7.13 a.m. train from Queen Street. Six of those present made the ascent of the ridge to the base of the rocks on the Grey Height, which forms the southern boundary of Corrie Ardran. From this point three of the party returned to Crianlarich by following the course of the stream to Inverardran, whilst the remaining three made their way along the rocks in an easterly direction, at an altitude of about 2,500 feet, to the head of the Corrie, thence ascending to the summit of Cruach Ardran, which was reached about two o'clock. The weather continued misty throughout the day, the clouds remaining heavy and completely enveloping the tops of all the higher hills, so that no view of the surrounding country could be obtained from the peak; but the beauty of the landscape was well suggested by a glimpse of the upper part of Strathfillan beyond Crianlarich, which was obtained from the slopes of the Cruach whilst descending. The day was fairly warm, the temperature at 600 feet altitude at 10 a.m. being 60° F., and on the summit (3,477 feet) at 2.50 p.m., 46° F. Except for a smart shower encountered on the descent when about a mile distant from Crianlarich, little or no rain was experienced.

The rocks, especially along the ridge of the Grey Height, are fairly rich botanically, but few alpine plants of outstanding interest were noted on this occasion. The most remarkable feature was the lateness of the season, few of the plants being in flower, and those mostly of species whose bloom is generally about over by this date, whilst of those usually found at this season in full flower, most were just beginning to blossom, many being in the bud condition. Especially noticeable was the fact that the various forms of *Hieracium*, for which this mountain is famous, were conspicuous by their absence, not a single alpine Hawkweed being seen in flower throughout the day. One late blossom of the Purple Saxifrage (*Saxifraga oppositifolia*, L.) was observed.

Amongst flowering plants the Mossy Campion (*Silene acaulis*, L.) was perhaps the most striking in its display of flowers, the rocks being adorned everywhere with its cushions of beautiful pink blossoms; whilst the Globe Flower (*Trollius europæus*, L.) and the Rose-root (*Sedum Rhodiola*, DC.) vied with each other in claiming the second place. Of the more interesting alpine species noted, special mention may be made of *Salix Lapponum*, L., which was in some abundance, the bushes being larger than those found in most localities, and, for the most part, in full flower; other plants were *Draba incana*, L., *Sibbaldia procumbens*, L., *Epilobium alpinum*, L., *Veronica humifusa*, Dicks., *Juncus trifidus*, L. and *Juncus castaneus*, Sm. The last-named species, one of our rarest alpine Rushes, was somewhat abundant on the marshy ground descending from the peak, at about 3,000 feet altitude.

Of mosses, the most interesting was *Sphagnum medium*, Limpr., which was gathered at 2,400 feet in the Corrie. The only other species worthy of note was *Hypnum crista-castrensis*, L., which was found on the slopes of the Grey Height. Of liverworts, the species noted were *Marsupeila aquatica*, Schiffn., *Lophozia quinqueidentata*, Cogn., *Scapania uliginosa*, Dum., *Radula Lindbergii*, Gottsche, var. *germana*, Jack, and *Pleurozia purpurea*, Lindb.

BEITH, 26th August, 1916.—Conductor, Mr. John Ritchie, Jun.—Owing to the very inclement day, only two members turned up at this excursion. They were met at Beith Station by Mr. Ritchie who directed the party over the Bigholm Hill. From various points of vantage a magnificent view is obtainable, at one point no fewer than 14 counties being visible. Mr. Ritchie on the way pointed out several places of historic interest, among these being the Moat of Beith where Arthurian legend avers a battle was waged; the Seat of Judgment on the Hill of Beith, which still retains its name; the Rocking Stone which still moves when pushed in one direction only; and a Druidical Circle bisected by the highway at the New Reservoir. The company, which was now joined by one or two lovers of natural history from Beith, then returned by Coldstream and the Lugton Road till Beith was reached. At a small burn outflowing

from the Reservoir there was a large number of Flies which Mr. King identified as *Mystacides azurea*, and at Coldstream Dam, large numbers of the green Frog hopper *Tettigonia viridis* were common. Mr. Shanks took the temperature of two of the wells; in the one at Cauldhame the water registered 52° F., the other, the "Weaver's Well" about 10 feet higher, registered 51° F. Among birds noticed were the Wheatear, Little Grebe, and Kestrel.

LANGBANK TO ERSKINE FERRY, 9th September, 1916.—Conductor, Mr. D. Macdonald.—The members who took part in this excursion were favoured with glorious weather, but unfortunately the tide was most unsuitable for ornithological observations. The shore was therefore quitted, and the party travelled along an old grass-grown road with a number of gates and fences protected by barbed wire. The trees in Erskine grounds, especially the Beeches, Birches, Limes, and Chestnuts, were greatly admired.

BALFRON AND ENDRICK WATER, 25th September, 1916.—Conductor, Mr. W. R. Baxter.—This excursion, which was undertaken jointly with the Andersonian Naturalists' Society, was attended by nine members. The morning was misty and cold, with an easterly wind, and the grass was very wet, but, as the day advanced, the weather conditions improved, and, although there was never any brilliant sunshine, there was no rain. On leaving Balfron Station the party followed a path across the fields to the aqueduct bridge across the Endrick Water, and thence proceeded along the north bank of the river to the Field Bridge below Balfron, exploring a small plantation and the park of Ballindalloch House on the way. In the park an Ash tree was measured, which showed a girth of 10 feet 8½ inches at 4 feet from the ground. From Balfron the route was continued on the same side of the Endrick by the Old Mill Lade and the Whiteyet Glen through another stretch of woodland to a point about 3 miles above the village. Crossing the river by the iron footbridge, the party next proceeded to Old Ballinrain, where a number of interesting trees were seen, and measurements of some of the more notable ones taken. Among these were:—

In the wood behind Old Ballikinrain House:—Scots Fir, 9 feet in girth at 3 feet from the ground; Silver Fir, 12 feet 11 inches in girth at 3 feet 6 inches from the ground on north side.

In the field in front of the house:—Scots Fir, 11 feet 11½ inches, at 2 feet on south side.

On the lawn:—*Sequoia gigantea*, 14 feet 11 inches at 3 feet 8 inches on south side. This fine tree has a girth of 21 feet at ground level.

There are also two aged Yew trees close behind the house, the larger of which measured 12 feet at 2 feet 8 inches. The other could not conveniently be measured, as it was partly built into a tool-house. The Oak has been planted extensively all over the district, and it appears to grow well. Some time was spent in exploring the grounds of Old Ballikinrain under the guidance of Mr. and Mrs. F. C. Gardiner, who afterwards entertained the party to tea.

Nothing notable falls to be recorded regarding the bird-life of the district. With the exception of Swallows and Sandmartins on the river, the only birds observed were the commoner resident species.

The list of flowering plants seen during the ramble totals 241 species, of which 103 were in bloom. The following may be mentioned as being of special interest:—

<i>Berberis vulgaris</i> L.	<i>Valeriana pyrenaica</i> L.
<i>Papaver Rhæas</i> L.	<i>Anthemis arvensis</i> L.
<i>Sedum Telephium</i> L.	<i>Cnicus eriophorus</i> Roth.
<i>Conium maculatum</i> L.	<i>Lycopsis arvensis</i> L.
<i>Ænanthe crocata</i> L.	<i>Verbascum Thapsus</i> L.
<i>Mimulus Langsdorffii</i> , Donn.	<i>Chenopodium Bonus-Henricus</i> L.
<i>Mentha piperita</i> L.	<i>Trisetum flavescens</i> Beauv.

Fungi were abundant, but, as the party did not include any expert mycologist, only 54 species were recorded. The most conspicuous species, both from its abundance and the fine condition of the specimens, was *Lactarius vellereus*, Fr., which was found in great profusion all along the route. Numerous beautiful specimens of the showy *Amanita muscaria*, L., were also seen, brightening the sombre woods with fine splashes of colour. *Clavaria vermicularis*, Fr., was found in the park at

Ballindalloch, and *Hygrophori* were plentiful in the grass lands on both sides of the river. Seven species of this genus were noted—*Hygrophorus psittacinus*, Schaeff, at Ballindalloch, and *Hygrophorus calyptraeformis*, Berk., at Old Ballikinrain, being in remarkably fine condition.

It is regretted that no records could be taken of the micro-fungi and mosses.

BALDERNOCK LINN, AULD WIVES' LIFTS, &c., 9th April, 1917. —Conductor, Mr. W. Jamieson.—The outlook on the morning of 9th April was liker Christmas than Eastertide, there being a snowfall of two to three inches still lying on the ground, but the sky was so clear, and the sunshine so warm, that, by the time the members of the Andersonian Naturalists' and the Glasgow Natural History Societies met at Bishopbriggs, the snow had almost entirely disappeared, and throughout the day the sun shone continuously, although the wind was somewhat sharp.

The stepping-stones at Cadder being submerged, a detour had to be made by Torrance, so that the walk to Balmore was to that extent prolonged. Calling at Glenorchard House on the way to Baldernock Linn, Mr. Bartholomew kindly showed the members what there was to be seen in the garden and hothouses, and also several skins of birds, including the Jay, Tree Sparrow, Hybrid between the Hooded and Carrion Crows, Pinkfooted Goose, Little Auk, and Capercaillie, the first two mentioned having been trapped, and the Little Auk found dead in the vicinity.

He mentioned that the Capercaillie had perched on a tree in front of the house, and had been seen in the grounds of Craigmaddie House. The nesting and feeding boxes attached to trees attracted the notice of the members, the tameness and trustfulness of the Coal Tit being commented on.

Arriving at Baldernock Linn the party was met by Mr. Andrew Barclay, who had prepared a plan of the Limestone Mine, which he explained to those interested.

Mr. Peter Macnair, in an article contributed to the *Glasgow Herald* of 5th June, 1915, admirably describes the Linn and details the various geological features.

He says: "The rocks beneath the fall and in the bed of the stream present a veritable microcosm of geological phenomena.

Here in a narrow compass one may make himself familiar with the various types of sediment which form the great mass of the coal formation in the neighbourhood of Glasgow, including sandstones, shales, ironstones, limestones, and coal, while these have been invaded by an igneous intrusion which has baked and altered them, the coal having passed into a kind of coke showing the characteristic columnar structure. The sedimentary rocks seen at the Linn have been formed at the bottom of seas and lakes or in estuaries, much as sand, gravel, and mud are laid down at the present time, while the limestones consist largely of fresh-water or marine animals, both of these types being represented. The igneous rock, on the other hand, has been erupted from the interior of the earth in a molten condition, and was probably connected in some way with volcanic action, of which there is abundant evidence all through the midland valley of Scotland. In some cases, as at the Linn, the original characters of the sedimentary rocks have been locally altered by these intrusions, but, as a whole, the sedimentary deposits are simply the charnel-heaps of a long vanished marine and fresh-water fauna, by the study of which we can restore, in more or less detail, the oceanography of the Carboniferous period.

“The upper half or that part lying above the entrance to the mine and forming its roof is the igneous rock, and there can be no doubt that the presence of this sill of hard igneous material amongst the softer sedimentaries is the reason for the existence of the waterfall at this point. Near the junction of this sill with the limestone it is seen to contain inclusions of coal which have been caught up by the molten rock and transformed into coke; and, from evidence derived from the immediate neighbourhood, it is quite clear that this is what is so well-known to Scottish geologists as the Hurlet coal, above which usually comes the alum shale and Hurlet limestone, their place in this case, however, being taken by the igneous rock. Below the alum shale comes the Campsie main coal or Hurlet coal, from four to five feet in thickness, resting on a bed of fine clay which contains the roots of trees that form the coal. The next number of the series, and perhaps the most interesting, is the white limestone which was formerly extensively quarried at the Linn. It is called

white limestone, because, on exposure, it turns to a white creamy colour. It contains ostracod fossils of a small flea-like animal. Below the white limestone comes a sandy limestone, followed by shales containing plant remains and the little brachiopod 'lingula,' and at the base of the waterfall there is another marine limestone, principally made up of the remains of 'crinoids,' From the foregoing it will be understood what a history is here unfolded to the geologist."

From the Linn the party made its way to Craigmaddie Moor where the trilithon popularly known as the "Auld Wives' Lifts" stands. Various theories have been put forward for the origin of this structure, the chief being the "glacial" theory, viz., that the stones were carried and deposited by the action of ice; the "subaërial denudation" theory of Professor Gregory, in which he postulates two valleys having a dividing ridge running north and south across the amphitheatre, the ridge then being cut across by the meeting of the branch valleys to the north of the Lifts, this formed a boss of sandstone in the centre of the depressions which was gradually reduced by the action of wind, rain, and weather to a sandstone tor; and the "human agency" theory, viz., that the stones have been placed in their present position by human agency and form a place of sepulture or a sacrificial altar. The various theories are still under discussion, but it is understood that Mr. Bartholomew has no objection to excavations being made which might throw some light on the origin. The structure was examined and photographed and the cup markings and the gravel bed in the vicinity visited. As none of the members wished to go over to Strathblane, it was decided to continue the walk by Baldernock Kirk and Milngavie to Killermont. Here the excursion was brought to a close after a most enjoyable outing.

Owing to the late season few flowering plants were noted, the list containing Coltsfoot, Daisy, Lesser Celandine, and Golden Saxifrage. Mr. Lee reports three mosses as noteworthy, viz., *Orthotrichum diaphanum* on wall at Glenorchard; *Polytrichum nanum*, roadside near Baldernock; and *Campylopus flexuosus*, very abundant on Craigmaddie Moor.

There was nothing noteworthy in the bird-life seen. No summer migrants had made their appearance, owing to the wintry conditions. A chance of seeing the Wheatear was expected, but this bird did not arrive in this district until 15th April.

POSSIL AND CADDER, 21st April, 1917.—Conductor, Mr. George Guthrie.—A party of ten met at Lambhill Canal Bridge, and followed the canal to Cadder village without entering Possil Marsh. They went round the Wilderness to Balmuilty, and then returned to Lambhill. The birds observed were as follows:—Redbreast, Great Tit, a Wagtail (species not defined), Mosscheeper, Greenfinch, House Sparrow, Yellow Bunting, Starling, Rook, Skylark, White and Black Swans, Mallard, Waterhen, Coot, Peewit, Dunlin, Redshank, Gulls (in distance), Lesser Black-backed Gull (pair). Curiously enough, no Thrushes were noticed.

SUMMERSTON AND NEIGHBOURHOOD, 19th May, 1917.—Conductor, Mr. D. Macdonald.—The weather on this occasion was of somewhat boisterous character, more typical of that of late February or early March than of mid May. As exemplifying the scarcity of insect life, a Spotted Fly-catcher was observed in the middle of a ploughed field, between Lambhill and Balmuilty, using the top of a drill as a vantage post for spying any chance insect. On the marshes near Summerston were found large numbers of Sandmartins and Common Swallows hawking very low in a strong breeze; they also seemed to have some difficulty in keeping the "wolf from the door."

On Bardowie Loch the same birds, along with Swifts, were found in considerable numbers, whereas in an ordinary year only a few, nesting locally, may be observed so late in the season. Altogether eleven species of summer migrants were observed, the Common Whitethroat, Housemartin, and Tree-Pipit refusing to declare their presence. One of the three pairs of Great Crested Grebes on the loch was seen, but there was no evidence that nest-building had commenced, as the reeds were still of limited growth.

HAMILTON HIGH PARKS AND BARNCLUITH, 22nd May, 1917.—Conductor, Mr. Jas. J. F. X. King, F.E.S.—This was to have been a joint excursion of the Andersonian Naturalists and the Glasgow Natural History Society, but owing to an unfortunate misunderstanding as to the meeting-place, the two contingents had not the pleasure of one another's company. Our party entered by the Barncluith Gate and visited, near the Rifle Range, an interesting specimen of a fair-sized Birch tree growing out of the hollow trunk of a large Oak, the root of the Birch being over 20 feet from the ground. We then went on our way over the High Parks, measuring trees. The White Cattle attracted the attention of the photographers, who chased some of the bulls into one enclosure, while in another enclosure they obtained views of the cows and calves.

Our intention was to go by the west side of the Gorge to the upper part, but when we arrived at the White Brig we found that our plans were upset, as the bridge was secured against passage by bolts and barbed wire. We had to retrace our steps and make for the Chatelherault Bridge and out at the gate. We then visited the very interesting terraced gardens at Barncluith, where the various trees and hedges are cut into the form of animals. One specimen of *Dictyopteryx Mortoni*, a large *Perla*, was taken upon the Chatelherault Bridge, and a specimen of one of the *Colletes* bees in the High Parks, the latter by Mr. Ross.

MILNGAVIE, THE ALLANDER, AND CRAIGALLIAN, 16th June, 1917.—Conductor, Mr. Geo. Lunam.—A party of seven proceeded along Clobber Road and reached the marshy tract between the Allander and the lade, passing on the way a fine bed of *Carex acuta*. In the pond, which has been very low for some time, is still a fair amount of *Apium inundatum*. In a damp meadow a little further on *Cardamine pratensis* was still making a fine show, although past its prime. The curious flight of a bat over the water, evidently in search of insects, attracted attention. Along the lade several shrubs were in good flower, the Dogwood making a fine show, and the Viburnum giving promise of a still finer appearance in a week or two. On entering the golf course the

party kept to the banks of the Allander, and in the damp ground here a number of interesting flowering plants was found, the Marsh Violet, the Bog-bean, the Bitter Cress, the Globe Flower (becoming scarcer), and the Wood Loosestrife being among the more noteworthy of the large number of species to be found here. The Wild Hyacinth was just beginning to tinge the undergrowth on the opposite bank with its delicate blue. In more shaded parts the flowers were well out.

After a short rest at the Allander Bridge the route was resumed, and Craigallian Loch was reached about 5.30 p.m. On the roadside at this point some fine plants of *Alchemilla arvensis* and *Draba verna* (still in flower) were got.

The next point of interest was Carbeth Loch, in the meadows near which *Viola lutea* was in delightful condition and profusion. At the outflow of the loch were a few toad tadpoles. Near here were some well developed plants of *Lastræa Filix-mas* and *Borreri* Newm., a very pretty and striking form of the common male fern. The return was made by the road to the east of Craigallian House, and across the fields past Mugdock Castle to the Reservoir, whence Milngavie was reached. The day's excursion yielded a list of 50 different plants in flower.

BOTANIC GARDENS, 19th June, 1917.—Conductor, Mr. G. H. Banks.—The party were met at the main entrance by Mr. James Rourke, Assistant Superintendent of Parks, who conducted them over the gardens. The Pond and Water-garden were first visited and many plants were here seen just at their best, among them being *Peltophorum virginicum*; *Typha latifolia*; *T. Shuttleworthi*; *Primula japonica*; &c. The Kibble Palace was next visited. At the entrance some fine specimens of the common Fig, *Ficus Carica*, carrying a good crop of fruit, attracted attention.

The north and south wings contained a few plants of interest such as *Schizanthus*, with its peculiar mechanism for the distribution of pollen; Cinerarias (many of these from the shores of the Mediterranean), Carnations, and Calceolarias—the last-named being specially admired by all.

In the Water-Lily House, the Lace-plant (*Ouvirandra fenestralis*) is growing in perfection—the secret being Loch Katrine's famed soft water. In the middle of the large basin or tank the Paper Reed (*Cyperus Papyrus*), Rice (*Oryza sativa*), Job's Tears (*Coix lachryma*), and the Sugar Cane (*Saccharum officinarum*) came in for examination. Many of the smaller aquatics were examined growing in small glass receptacles—*Vallisneria spiralis*, the Eel or Tape Grass; *Trianea bogotensis*, which resembles our native Frogbit, &c.

The last house to be visited was the Moss House which was looking its best. *Hymenophyllums*, *Todeas*, Liverworts and Mosses, in great variety and from a wide range of country, were seen and examined.

A visit was also paid to the group of medicinal plants, which have a special interest at the present time, as illustrating the possibility of reviving an old industry, much neglected in this country in modern days.

The Glasgow Naturalist

The Journal of the NATURAL HISTORY SOCIETY
OF GLASGOW.

Vol. VIII, No. 6.]

[March, 1926.

Proceedings of the Society.

25th September, 1917.

THE first meeting of the sixty-seventh session was held this evening, Mr. John R. Lee, Vice-President, in the chair.

Mr. P. E. Dollin, 24 Watson Avenue, Rutherglen, was elected an Ordinary Member.

Mr. William Rennie exhibited land and fresh-water Molluscs, the names of which had been authenticated by Mr. W. Denison Roebuck, F.L.S. *Sphaerium corneum* (L.), *Pisidium nitidum*, Jenyns, *P. subtruncatum*, Malm, *Valvata piscinalis* (Müll.), and *Planorbis contortus* (L.), all from Milngavie, were new records for Dunbartonshire (vice-county 99). *Hyalinia lucida* (Drap.), from Kirn, was a new record for Main Argyll (v.c. 98). A characteristic example of *Milax Sowerbii*, Fér., also from Kirn, was not only new to the list for v.c. 98, but the farthest north record for the western slopes of Scotland. Two other slugs from Kirn, *Limax maximus* var. *obscura*, Moq., and *L. arborum* var. *bettonii*, Sord., were considered such fine examples of these varieties that they were placed in the British Museum, London.

Mr. Alex. Ross, F.E.I.S., exhibited specimens of *Psilla buxi*, L., from Tarbert, Loch Fyne. This species was recorded in the British Association list, 1901, as occurring on various plants in the Clyde area, but never on Box shrubs. In 1906 it was taken at Benmore, Holy Loch, by Mr. James J. F.-X. King, F.E.S., on the name-plant. The exhibit was a second record of the insect from that shrub. Mr. Ross stated his belief that the species would be found more commonly on the Box if search were made.

Mr. Ross, on behalf of Mr. R. D. Wilkie, exhibited specimens of the Creeping Dog's-tooth Grass, *Cynodon Dactylon*, Pers., from Penzance. The grass is confined to South-West England, where it is plentiful locally in a few stations.

Mr. D. A. Boyd contributed a paper, "The Fungi of the Inveraray District." The author considered the natural conditions of the district favourable to the development of plant life in great abundance and rich variety. He traced the various mycological records for more than a century, and pointed out that two visits of the Cryptogamic Society of Scotland, in 1888 and 1907, were particularly fruitful. The total of Hymenomycetes and Gastromycetes recorded on these visits was 218, of which 92 were seen in 1888 only, 48 in 1907 only, and 78 on both occasions. Of Microfungi the total recorded was 206, of which 100 were observed in 1888 only, 67 in 1907 only, and 39 on both occasions. The author was preparing a full list for the district.

Mr. Boyd also gave a paper, "Some Additional Mycological Records for the Clyde Area." In this he reported the following as recent additions to the fungus flora:—*Thelephora spiculosa*, Fr., at Kilmarnock; *Caeoma laricis* (West.) Plow., at Ardrossan; *Galactinia praetervisa* (Bres.) Bond., at Glasgow; *Hypoderma scirpinum*, DC., at Loch Fergus, Ayr; *Mycosphaerella pelvetiae*, Sutherl., near Ardrossan; *Diplodia laminariana*, Sutherl., along the coasts of Ayrshire, &c.; *Diplodia inquinans*, West., at West Kilbride; *Prosthemium stellare*, Riess., at Kilwinning; *Cercospora salina*, Sutherl., along the coasts of Ayrshire, &c.; *Alternaria maritima*, Sutherl., Ayrshire, &c.; *Didymium squamulosum* (Alb. & Schw.) Fr., at Dalry.

30th October, 1917.

The sixty-sixth Annual General Meeting was held on this date, Mr. W. R. Baxter, President, in the chair.

The Hon. Secretary, Mr. Alex. Ross, F.E.I.S., submitted the Council's Annual Report. The Society had lost by death Mr. Edgar A. Smith, F.L.S., I.S.O., Corresponding Member; Dr. Charles F. Pollock, F.R.S.E., Life Member; Mr. George

W. Stout, Dr. James Stirton, F.L.S., and Mr. Joseph Russell, Ordinary Members.

The membership now is:—Honorary Members, 14; Corresponding Members, 29; Life Members, 18; Ordinary Members, 155—a total of 216. There are also 4 Associates.

The Hon. Librarian, Mr. James Mitchell, reported on the Library, and paid a tribute to the assistance given to him by Mr. William Rennie. The Hon. Editor, Mr. John Paterson, reported on the Society's Publications. Owing to the illness of the Hon. Treasurer, Mr. John Renwick, his report was held over.

The following office-bearers were elected:—President, Mr. J. F. Gemmill, M.A., M.D., D.Sc.; Vice-President, Mrs. E. R. Ewing; Hon. Secretaries, Mr. Ross and Mr. J. Dick, M.A.; Hon. Treasurer, Mr. George Guthrie, LL.B.; Hon. Librarians, Mr. Mitchell and Mr. Rennie; Hon. Editor of Transactions, Mr. Paterson; Hon. Lanternist, Mr. John R. Thomson; Members of Council, Messrs. Baxter, J. R. Jack, M.I.N.A., George Lunam, and Andrew Barclay. Messrs. Joseph Sommerville and James Jack were re-elected Auditors.

Mr. George Brown, M.A., Schoolhouse, Littlemill, by Patna, Ayrshire, was elected an Ordinary Member.

Mr. John R. Lee exhibited specimens of *Calluna vulgaris*, Salisb., var. *incana*, Reichb., which had been obtained at Millport by Mr. R. Grierson. This was the first record of the plant from the Clyde area.

Mr. James J. F.-X. King, F.E.S., exhibited specimens of *Triphyllus punctatus*, F., a beetle of the Family Mycetophagidae new to Scotland. It was taken at an excursion to Cadzow High Parks on 22nd September, 1917.

Mr. John Thomson, F.R.I.B.A., exhibited a large number of autochrome lantern slides of garden and wild flowers. The slides were described by Mr. Thomson and Mr. John Cairns.

27th November, 1917.

The third meeting of the sixty-seventh session was held this evening, Dr. J. F. Gemmill, President, in the chair.

Mr. James Mitchell proposed that Mr. John Renwick be elected a Life Member, this being a fitting way to show the sympathy of the members with Mr. Renwick in his illness, and at the same time to recognise his services to the Society, of which he had been Hon. Treasurer for over 30 years. The motion was carried unanimously.

Mr. James J. F.-X. King, F.E.S., exhibited specimens of the larvae, pupae, puparia, and perfect insect of *Aradus corticalis*, L., a Hemipteron, taken at Rannoch, of a genus and species not previously recorded for Scotland.

Mr. Archibald M'Lachlan exhibited a collection of Moths from various regions. For comparison, Mr. King exhibited the Butterflies, *Ornithoptera brookeana*, Roth., from Borneo; and *Cethosia Vietneri*, Felder, from India.

Mr. Louis P. W. Renouf, B.A., exhibited specimens, all from Bute, of Richardson's Skua, *Stercorarius parasiticus* (L.); a hybrid of Blackcock and Red Grouse; and hybrid of Blackcock and Capercaillie.

Mr. John Paterson read a paper, "A Tree-Lover's Notes near London."

25th December, 1917.

The fourth meeting of the sixty-seventh session was held this evening, Dr. J. F. Gemmill, President, in the chair.

Mr. John Peden, Marine Station, Millport, was elected an Ordinary Member.

Mr. T. Thornton MacKeith delivered a lecture, "Some Birds and their Nests," this being the first of a series of lectures, to which members of kindred societies were invited. Mr. MacKeith described, with the aid of lantern slides, the birds commonly found in various habitats, and gave notes of his observations on their nesting habits.

19th January, 1918.

The fifth meeting of the sixty-seventh session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair,

Mr. Ivie Campbell, 800 Crow Road, was elected an Ordinary Member.

Intimation was made of the deaths of Mr. Thomas Wilson, Ayr, and Mr. Wm. Macadam Smith, Hollington, and the Hon. Secretary was instructed to convey to the relatives the sympathy of the Society.

Mr. James J. F.-X. King, F.E.S., exhibited a Tortoise-shell Butterfly, *Vanessa urticae*, L., caught a few days previously at Bearsden.

Mr. Alec Steven, L.R.A.M., delivered a lecture, "The Palace of Honey." After a short account of the Solitary and Humble Bees, he described the polity and civilisation of the Honey Bee, *Apis mellifica*, L. Specimens of young superfluous queens killed by the workers were exhibited. Numerous lantern slides illustrated the anatomy and life-history of the various inhabitants of the hive. Samples of honey from different plants were shown. Mr. Steven concluded with a description of modern methods of bee-keeping, as taught to wounded soldiers at Erskine Hospital.

21st February, 1918.

The sixth meeting of the sixty-seventh session was held this evening in the Botanical Lecture Room, Glasgow University, Professor F. O. Bower, Sc.D., F.R.S., in the chair.

Mr. Alec Steven, L.R.A.M., 12 Regent Park Square, was elected an Ordinary Member.

Dr. J. F. Gemmill delivered a lecture, "Segmentation and Germ-Layer Formation in certain Actinozoa." He discussed especially the early stages of development of the Sea-Anemones, *Tealia crassicornis* (Müll.), *Adamsia palliata* (Bohad.), and *Actinoloba dianthus* (Ellis). Their eggs form a series as regards yolky contents, a large amount being present in the first species and very little in the last. Segmentation, blastula formation, and gastrulation, while fundamentally of the same type throughout, are modified according to the amount of yolk present.

Segmentation.—In *Tealia* the fertilised nucleus divides until about 16 daughter nuclei are present; then the egg mass divides totally into an equal number of masses, each with one nucleus. In *Adamsia* only four daughter nuclei are present when the egg mass divides. In *Actinoloba* division of the egg mass proceeds *pari passu* with division of the nucleus.

Blastula Formation.—In *Tealia* and *Adamsia*, at a slightly later stage, the inner ends of the segmentation cells separate off, and form a central non-nucleated trophenchyme, surrounded by an outer wall or shell of small nucleated cells. During this process great crumpling or folding of the outer wall takes place. In the end the outer wall becomes quite smooth and uniform again. In *Actinoloba* the blastula stage is a hollow sphere surrounded by a single layer of cells slightly larger at one side.

Gastrulation.—In *Actinoloba* gastrulation is by simple and direct in-pushing of the larger cells of the blastula wall. In *Tealia* and *Adamsia* a similar in-pushing occurs, and during its progress the central trophenchyme gradually filters through the in-pushing layer and comes to lie within the gastrula cavity or archenteron, where it is finally digested and serves as the only food utilised by the young animal until it has fixed itself and become an Anemone.

The larvae of all three species swim about for a time before becoming fixed, and during this time the larva of *Actinoloba* feeds by ciliary action in much the same way as a young Sea-Urchin or Star-fish larva. The stomodaeum or gullet is formed in all three species by secondary in-pushing or involution just at the place where gastrulation first took place.

In another Anemone, on the development of which Dr. Gemmill was working, the lining of the gastrula or digestive cavity arises somewhat differently, by the sinking in of small pits all over the surface of the blastula. The cells at the bottom of these pits become nipped off, and then join up to

form a continuous digestive layer, with which the mouth and gullet come into relation when formed in due course.

The lecture was illustrated by lantern slides prepared from micro-photographs.

26th March, 1918.

The seventh meeting of the sixty-seventh session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

Mr. Thomas Hill, 26 Blantyre Street, was elected an Ordinary Member.

Intimation was made of the death of Mr. Walter Wingate, M.A., and the Hon. Secretary was instructed to convey to the relatives the sympathy of the Society.

Mr. R. B. Johnstone sent a report of the Fungus Forays to Craigton on 6th October, 1917, and to Pollok on 13th October, 1917. The list, the longest for some years, included 112 species belonging to 53 genera.

Mr. Peter Macnair, F.G.S., F.R.S.E., delivered a lecture, "The Flora and Fauna of a Carboniferous Coral Reef." He described the Blackbyre Limestone, a stratum which had been specially studied by West of Scotland geologists. Of estuarine formation, it lies at the base of the Lower Carboniferous series, and is exposed at many places from Ayrshire and Renfrewshire in the west to Fifeshire and Midlothian in the east. It is overlaid by rocks rich in Brachiopods, Lamellibranchs, and Fishes. The Blackbyre Limestone itself contains numerous Polyzoa, Gastropods, Ostracods, Sponges, and Foraminifera. Corals are abundant, and the lecturer described the characters of representative genera, *Chaetetes*, *Amplexus*, *Zaphrentis*, *Campophyllum*, *Lithostrotion*, *Lonsdaleia*, *Clisiophyllum*, and *Cyclophyllum*. The lecture was illustrated by diagrams and numerous hand-specimens, and by photographs of sections.

25th April, 1918.

The eighth meeting of the sixty-seventh session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

A letter from Dr. J. F. Gemmill was read, suggesting that the members of the Microscopical Society should be invited to join the excursions. This was approved.

Intimation was made of the death of Mr. James Shearer, jun., while serving as a sergeant in the Glasgow Highlanders, and the Hon. Secretary was instructed to convey to the relatives the sympathy of the Society.

Mr. Thomas W. Wilson reported on the excursion to Corkindale Law, Loch Libo, and district.

Mr. James J. F.-X. King, F.E.S., exhibited specimens of *Zygaena achilleae*, Esp., and *Apocheima lapponaria*, B., two scarce species of Moths taken in Scotland.

Mr. William Rennie read a paper, "Notes on the Occurrence of the Whooper Swan, *Cygnus musicus*, Bechstein, at Possil Marsh, 1918." The marsh affords good feeding for this species in its abundance of *Fontinalis antipyretica*, L., and *Elodea canadensis*, Michx., harbouring in fair numbers the fresh-water Molluscs, *Bythinia tentaculata* (L.) and *Sphaerium corneum* (L.), whilst among the muddy reeds at the northern end of the marsh occur three species of *Limnaea* and the small bivalve, *Pisidium cinereum* (Alder). The food is chiefly aquatic plants. Three adult Whoopers and three Cygnets were seen at the extreme southern end of the marsh on 2nd March. On the 18th three other Swans were observed, whether Whoopers or Bewick's was uncertain. The first task of the Whoopers was to obtain supremacy of the water, and after the 17th only the pair of resident Mute Swans remained. On the 24th the six Whoopers made an unsuccessful attack upon the pair of Mute Swans. Later, in a renewed attempt, they gained a partial success by driving the enemy into the vegetation along the eastern side; but at no time were they able to displace the resident pair from the water. On the 30th two visiting Mute Swans landed, but took to flight on the approach of the Whoopers. On the 7th April a fierce encounter took place, ending in the defeat of the Whoopers, who left the marsh that morning. Mr. Rennie described the

character and habits of the Whooper Swan, a species now recorded for the first time from Possil Marsh.

Mr. Rennie read a second paper, "The Great Spotted Woodpecker, *Dendrocopus major* (L.), at Possil Marsh." On 27th April borings were seen on the willows at the eastern corner of the marsh, and on the 29th the male and the female bird were seen. This species also is an addition to the list of birds for Possil Marsh.

Mr. R. S. Wishart, M.A., sent a paper, "Some Garden Weeds in Kent," giving particulars regarding the commonest weeds in his garden.

24th May, 1918.

The ninth meeting of the sixty-seventh session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

Mr. Alex. Ross, F.E.I.S., read a report on the excursion to Bishop Loch on 4th May. The number of Mute Swans had gradually increased during the last few years, possibly at the expense of the colony at Hogganfield Loch. The Wayfaring Tree, *Viburnum Lantana*, L., was seen.

Mr. James J. F.-X. King, F.E.S., reported on the excursion to Ballagiach on 21st May. Coleoptera of the Families, Staphylinidae, and Trichopterygidae were taken, as well as specimens of Aphodii, Coccinellidae, and a number of the smaller Ichneumonidae. Thirty-nine species of birds were noted.

Mr. R. S. Wishart, M.A., sent for exhibition specimens from West Malling, Kent, of *Saxifraga tridactylites*, L., *Euphorbia amygdaloides*, L., *Hippocrepis comosa*, L., *Aceras anthrophora*, Br., and *Puccinia adoxxae*, DC.

Mr. John Renwick exhibited a specimen of the Toothwort, *Lathraea clandestina*, L., from Kilwinning. Except for the Royal Botanic Garden, Edinburgh, and the Botanic Gardens, Glasgow, where the plant was shown growing on the root of a willow in May, 1915, this is believed to be the only record for Scotland.

Mr. Ross, for Mr. J. G. M'Nicol, of Kildonan, Sutherlandshire, exhibited a very pale Adder, *Pelias berus*, L., and a portion of a Red Deer Stag's horn with a peculiar growth.

Mr. R. Grierson read a paper, "Our Alien Problem," dealing with plants which are not natives of our district. Garden escapes are the least interesting of these, and seldom become established. Many aliens were first naturalised in England, and then spread to Scotland. Plants so introduced might remain casuals, recur irregularly, settle but remain local, or become widespread. They should be sought in such situations as coups and rubbish heaps. The neighbourhoods of Troon and Ardrossan harbours are rich hunting-grounds. Records were given of the occurrence of *Matricaria suaveolens*, Buchenau, *Sisymbrium pannonicum*, Jacq., *Senecio viscosus*, L., *Agrimonia Agrimonoides*, L., *Mimulus Langsdorfi*, Donn., *Dracocephalum parviflorum*, Nutt., *Ambrosia trifida*, L., *Isatis tinctoria*, L., and others. The list was extended by Mr. William Rennie and Mr. Thomas Hill. It was suggested that a short description of these aliens would be a desirable addition to Hennedy's "Clydesdale Flora."

25th June, 1918.

The tenth meeting of the sixty-seventh session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

Mr. H. Stuart Girvan, B.L., 252 West George Street, was elected an Ordinary Member.

Mr. Alex. Ross, F.E.I.S., read a report on the visit to Erskine on 11th May, when Mr. Alec Steven showed the methods of training disabled soldiers in the art of bee-keeping, and the members afterwards remeasured a number of trees formerly measured and recorded by Mr. John Renwick. Some other trees were measured for the first time.

Mr. Ross also reported on the visit to the Botanic Gardens on 18th June. *Agave striata*, Zucc, was seen in flower.

Mr. John R. Lee reported on the excursion to Bardrain Glen on 15th June. The most noteworthy of the plants

observed were *Plantago media*, L., *Salix pentandra*, L., *Trollius europaeus*, L., *Trientalis europaea*, L., and *Meum Athamanticum*, Jacq.

Dr. J. F. Gemmill sent for exhibition the hydrosome and medusa of *Podocoryne carnea*, Sars. The Hydroid was found at Millport on a dead valve of Pecten; it was kept in an aerator in the Embryology Laboratory of Glasgow University, and medusae were liberated in the last week of April.

Mr. J. Dick, M.A., exhibited specimens of *Podocoryne areolata*, Alder, from the Clyde area, for comparison, and the Hydroid, *Gonothyraea Lovéni*, Allm., found by him at Troon, on *Fucus vesiculosus*, L.

Mr. John Cairns exhibited flowering specimens of exotic shrubs from Craignish and Poltalloch, including *Kalmia latifolia*, L., *Colletia cruciata*, Hook & Arn., *Calceolaria violacea*, Cav.

Mr. John Paterson read a paper, entitled "Regal Richmond and the Land of Swale."

24th September, 1918.

The first meeting of the sixty-eighth session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

Mr. James Neilson read an In Memoriam notice of Mr. John Renwick, who died on 23rd July after a long and painful illness. Mr. Renwick was a naturalist of wide sympathies. He joined the Geological Society of Glasgow in 1874, and was for many years a member of Council and convener of the Excursions Committee. To the *Proceedings* of the Society he contributed important papers on the Glen Fruin moraine and on the "Auld Wives' Lifts." He became a member of our Society in 1879, and was elected Hon. Treasurer in 1885. He held this office for 32 years. He contributed largely to the success of the meetings by the numerous exhibits which he brought before the members, by the valuable reports of the many excursions which he conducted, and by the series

of papers on trees of the Clyde area which he read to the Society. Of these the following are the most important:—“Notes on Trees in Auchendrane,” “Auchendrane and its Trees,” “On the Beeches in the Clyde Drainage Area,” “On the Sycamores in the Clyde Drainage Area,” “Notes on the Ash Trees in the Clyde Drainage Area,” “Notes on Yew Trees in the Clyde Area,” “Kilkerran and its Trees,” and “The Spanish Chestnut in the Clyde Area.” Along with Mr. Richard M'Kay he contributed “Measurements of Notable Trees” to the “Handbook on the Natural History of Glasgow and the West of Scotland,” published for the British Association meeting in 1901. Mr. Renwick was also an authority on Scottish place-names.

The Society mourns the loss of a very worthy member, and pays this tribute to the memory of one who spoke with authority on the subject he had made his own, who from his stores of learning was always ready to help his neighbours, and whose genial presence and kindly humour endeared him to his friends.

The Hon. Secretary was instructed to convey the sympathy of the Society to Mrs. Renwick.

Mrs. Grace Renwick, 9 Crosbie Street, Maryhill, was elected an Ordinary Member.

Mr. John R. Lee reported on the excursion to Blairskaith Moor on 29th June. The only plants of particular interest noted were:—*Radicula sylvestris*, Druce, on a damp spot by the road near Cadder; *Jasione montana*, L., on the bank of the Canal between Cadder and Torrance; *Mentha alopecuroides*, Hull, on the roadside beyond Torrance; and several very fine plants of *Orchis latifolia*, L., on Blairskaith Moor.

Mr. George Guthrie, LL.B., reported on the excursion to Mugdock on 10th August. Among the plants noted were *Erinus alpinus*, L., *Corydalis lutea*, DC, *Campanula Trachelium*, L., and *Verbascum Thapsus*, L. A Gean tree, *Prunus avium*, L., said to be 70 years old, measured 8 feet

5¼ inches at 3 feet 6 inches from the ground; at 2 feet 6 inches higher it girthed 6 feet 6 inches, the difference probably being due to an ancient second bole or large branch which had disappeared.

Mr. Alex. Ross, F.E.I.S., exhibited the Scale Fern, *Ceterach officinarum*, Willd., from Stonefield, Tarbert, Loch Fyne. The plant was growing plentifully on a wall bounding the road, and Mr. Ross suggested that the species was not so rare in the West of Scotland as the recorded stations seemed to show.

Mr. Lee exhibited the rare Bog Orchis, *Malaxis paludosa*, Sw., from near Coiletter, Glen Falloch, also specimens of *Juncus squarrosus*, L., showing petalody.

Mr. James Neilson exhibited a series of views from Derbyshire, including pictures of famous trees.

Mr. Andrew Barclay, F.E.I.S., delivered a lecture, "Water-Insects and their Manner of Life." He pointed out that insects had migrated from the land to the water, and showed the importance of the surface film to insects which passed through their larval stage there. He described the habits of various species and the contrivances by which they were enabled to live in water. The lecture was illustrated by lantern slides.

29th October, 1918.

The sixty-seventh Annual General Meeting was held this evening, Dr. J. F. Gemmill, President, in the chair.

The Hon. Secretary, Mr. Alex. Ross, F.E.I.S., submitted the Council's Annual Report. During the session 7 Ordinary Members had been added to the roll; 2 had been removed by death—Mr. James Shearer, Jr., killed in action, and Mr. John Renwick, after a long illness. The roll now stands:—Honorary Members, 15; Corresponding Members, 27; Life Members, 18; Ordinary Members, 159—a total of 219. There are also 4 Associates.

The Hon. Librarian, Mr. James Mitchell, reported on the Library, and referred to the assistance given by Mr. William Rennie.

The following office-bearers were elected:—Vice-President, Mr. Robert Henderson; Members of Council, Messrs. Louis P. W. Renouf, B.A., Anderson Fergusson, D. MacDonald, and R. M'Lean, M.A. Mr. John R. Lee was elected Auditor.

Mrs. Cairns MacLachlan, 32 Montgomerie Street, and Mr. R. Grierson, 29 Caird Drive, were elected Ordinary Members.

Mr. L. Watt reported on the excursion to Duncomb on 30th September. Among the plants noted was the Parsley Fern, *Cryptogramme crispa*, Br.

Mr. Ross exhibited specimens of *Sirex gigas*, L., captured at Kildalton, Islay, by Dr. Gilmour, and at Tarbert, Loch Fyne, by himself. In the latter station several individuals were seen in July and August last year, but none taken. These captures add the County of Argyll to the 8 counties mentioned by Mr. Ballantyne from which this species has been recorded. Mr. Ross also exhibited *Sirex juvenicus*, L., sent by Mr. Watt, and captured on board a submarine which was being repaired at Clydebank.

Dr. Gemmill delivered a lecture, illustrated by lantern slides, "Some Notes on Recent Work." He showed that very definite and constant ciliary currents flow over the different internal surfaces of the Ctenophore, *Pleurobrachia pileus*, Fabr. They ensure thorough mixing of the contents of the digestive cavity, and regular interchange of fluid everywhere within the funnel and the radial and meridional system of canals. Next it was shown that a similar complex to the heart-complex in young Brittle-Stars at metamorphosis, beating with a very regular rhythm every 11 or 12 seconds, has now been found in Star-fish and in Regular and Irregular Echinoids. It is comparable to the heart-complex of Balanoglossus, which seems to have had the same ancestor as Echinoderms. Taking up next the life-history of the Medusa, *Melicertidium octocostatum* (Sars), the lecturer exhibited

slides of its eggs, early larvae, and young hydroid stages, which are peculiar in not possessing a thecal covering for the trophosome, although the Medusa belonged to the Leptomedusan type. The reared hydroids appear to be the same as a form which was found two years ago in the tanks at the Millport Station: a new record for the Clyde, if not a new species altogether. Lastly, a short account was given of the development of the large Sea-Anemone, *Bolocera*, its segmentation and gastrulation, and the manner in which the great mass of yolk contained is affected during these processes and made available for digestion within the stomach cavity.

26th November, 1918.

The third meeting of the sixty-eighth session was held this evening, Dr. J. F. Gemmill, President, in the chair.

The Hon. Treasurer, Mr. George Guthrie, LL.B., submitted his report for session 1917-1918, and it was approved.

Mr. John R. Lee exhibited specimens of *Sphagnum medium*, Limpr., from the Kilpatrick Hills. This species, regarded as somewhat rare, is a new record for Dunbartonshire (v.c. 99).

Mr. Andrew Barclay, F.E.I.S., exhibited specimens of the Stag Beetle, *Lucanus Cervus*, L., and gave an account of its life-history.

Mr. R. Grierson read a paper, "More Glasgow Aliens," an addition to his earlier paper, "Our Alien Problem."

24th December, 1918.

The fourth meeting of the sixty-eighth session was held this evening, Mrs. E. R. Ewing, Vice-President, in the chair.

Mr. James J. F.-X. King, F.E.S., exhibited specimens of *Ornithoptera brookeana*, Roth., from Borneo, and other Butterflies.

Numerous autochrome lantern slides, dealing with plant and bird life and with scenery were exhibited by Messrs. W. R. Baxter, W. M. Pettigrew, and John Thomson.

Review.

THE BIRDS OF HARESHAWMUIR.—By E. Richmond Paton. The "Standard" Office, Kilmarnock. (4s. net). — To this addition to the large number of monographs which relate, in detail, the avian features of various districts in the "Clyde Area," which differ widely in their physical characteristics, a hearty welcome should be extended by "Clyde" ornithologists. The area covered in this little work lies in the eastern portion of the parish of Fenwick, in Ayrshire. It is a moorland district, rising from 400 feet to 1,000 feet above sea-level, a region in which "peaseweeps, plovers, and whaups cry dreary." A unique feature of the work is that it gives us (and for the first time) a full, satisfactory, and intimate account of a bit of "Clyde" lying at a comparatively high elevation. Though not geographically remote, its avi-fauna presents aspects which differ from those we are familiar with at lower levels. There the Fieldfare is more common than the Redwing, the Coal-Tit than the Blue-Tit, the Brambling (notoriously irregular with us) is a regular visitor, the Reed-Bunting is quite as common as the Yellow Bunting. Summer visitors, for the most part, arrive later there, and perversely leave earlier, and so on. There are many interesting notes scattered throughout the work of changes in the nesting haunts occupied by birds, chiefly to checkmate persecution; also of changes in their distribution. There is, happily, evidence that a number of species are increasing; but, unhappily, this is more than counterbalanced by the evidence which goes to show that more are decreasing. In many instances, intelligible reasons are assigned for the changes, but not in all. It is a tribute to Mr. Richmond Paton's enthusiasm that he has made history, in an ornithological sense, by obtaining examples of the Continental Song-Thrush on his territory. The first was got on 17th September, 1925, when he noticed two or three small parties of Thrushes, evidently, and as was eventually proved,

incomers. It is perhaps worthy of note that on the 14th of September, 1925, by which date local Thrushes had largely disappeared, a party of twenty Song-Thrushes, which kept close company, appeared at Rouken Glen Park. On the 21st about thirty Song-Thrushes, again keeping close company, in a small area, were seen there. They may well have been part of the movement that embraced the Hareshawmuir birds. The first example of the Hebridean Song-Thrush recorded for the mainland was obtained by Mr. Richmond Paton, on 6th October, 1922. He has not yet succeeded with the Continental Coal-Tit, though he concluded he was on the track of one with a back "very light slate-grey in colour," on 20th January, 1920. He should persevere, as on a ground of pine-needles, in a recent extension of Linn Park, on 17th December, 1925, a large Coal-Tit, with a very conspicuously grey back, was seen, which contrasted remarkably with other Coal-Tits in the neighbourhood and with others seen in another locality next day. We commend this book as an important and original contribution to the literature of the bird-life of the "Clyde Area."

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