RETURN TO

LIBRARY OF MARINE BIOLOGICAL LABORATORY

WOODS HOLE, MASS.

LOANED BY AMERICAN MUSEUM OF NATURAL HISTORY

The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

JAMES W. H. TRAIL, M.A., M.D., F.R.S., F.L.S.

PROFESSOR OF BOTANY IN THE UNIVERSITY OF ABERDEEN

AND

WILLIAM EAGLE CLARKE, F.L.S., MEM. BRIT. ORN. UNION

NATURAL HISTORY DEPARTMENT, MUSEUM OF SCIENCE AND ART, EDINBURGH

1898

EDINBURGH

DAVID DOUGLAS, CASTLE STREET

LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

#161 (28)
6

A1515

The Annals
of
Scottish Natural History

No. 25] 1898 [JANUARY

THE LATE MORRIS YOUNG, F.E.S.

READERS of the "Annals" would notice with regret the announcement of the death of Mr. Morris Young, which took place at Paisley early in the morning of the 26th of February 1897. Mr. Young was born in 1821, and from his very earliest boyhood exhibited qualities which marked him out as a born naturalist. Undoubtedly he was the pioneer in the scientific study of natural history in Paisley, if not in the West of Scotland. When Mr. Young first took up the study of entomology, there were not half a dozen entomologists in the whole of Scotland, and books on the subject were few and expensive, while the best of them were not written in our language. The want of books led Mr. Young to learn to draw, in order to illustrate what he meant in his correspondence with other entomologists. In this he was more than successful, for his entomological drawings were perfect both in detail and colour. Books with uncoloured plates which he purchased later in life he often coloured.

As the result of an accident which he received while yet a boy, Mr. Young was lame. It is said that, while still unable to move far from the house, he passed his time sitting at the open window with a net, capturing all the insects which came within his reach. In after life this lame-

ness did not hinder Mr. Young from active service—in fact he could walk with any sound-limbed person ; nor did it daunt his courage. We saw him once rush across the street and rescue an aged clergyman from the abuse of a drunken Irishman ; and in the Museum, woe betide man, woman, or child who misbehaved, for out they went. Being debarred, by reason of this lameness, from entering his chosen profession of medicine, Mr. Young became a schoolmaster. Many men and women still living in Paisley remember being in Mr. Young's day-school in the long ago. They recollect with pleasure how on certain fixed days—red-letter days they were to both teacher and scholars—a lecture was given on butterflies and moths and other less attractive insects, and with what astonishment they looked upon the wonderful collection which he exhibited to them. At first Mr. Young used to find some difficulty in getting out to collect as early in the morning as he wished. He and a companion hit upon the device of leading a string from his bed, through the window, to the street below. On going to bed at night, Mr. Young tied the string to his big toe. In the morning his friend came along and, pulling the string, awoke him. This, however, did not long work well. Some other companions, having learned the system, rose at untimeous hours and drew the string, much to Mr. Young's discomfiture.

Long before 1860, Mr. Young was well known amongst entomologists in Great Britain and on the Continent as a leading Coleopterist. Among his correspondents such men as Rye, Smith, Wollaston, Murray, and Waterhouse may be mentioned. In Lepidoptera also he had an extensive knowledge, and possessed a very good local collection. In short, Zoology, as a whole, had great attractions for him ; and as he wandered through our woods and glens, or over the lofty Bens that overlook the estuary of the Clyde, or along the banks of our rivers and lochs, he had ample opportunities of observing the beauties of nature and of learning the many lessons which she alone can teach.

In 1862 a few of his scholars and others whom he had interested in his own study formed themselves, under his leadership, into a Natural History Society. They met two

or three times a month in his schoolroom in Old Sneddon for the identification and classification of the captures which had been made in their collecting excursions. To these meetings some of his own cases of insects were brought to help the members in their work. As the result of his exertions, a splendid society of active workers was gathered together. Not one of the members of that early society will soon forget those experiences and the delight and enthusiasm which his untiring efforts infused into them. Many of those members afterwards became known to science as earnest workers. His knowledge of the habits and peculiarities of beast, bird, and insect was simply wonderful, and his clear and enthusiastic observations appeared to the minds of his hearers more like some story from the "Arabian Nights," and could not fail to make lifelong converts to the study he loved so well. This society increased in membership and made great progress, chiefly in entomology, till it was incorporated with the Paisley Philosophical Society. The meeting-place was then transferred to the School of Design Buildings, and every encouragement was given to the members by that wealthy and influential society. Under Mr. Young's direction, lists of the Mammals, Birds, and Insects of Renfrewshire were compiled, and additions were made to these from time to time. In 1867 the Philosophical Society held an exhibition of the various collections belonging to the Society and to private members. It was open to the public for a week, and each evening papers on a variety of subjects were given. Mr. Young's large collections of insects nearly filled one of the halls. It was then that the late Dr. Frazer, the president, first intimated the intention of the late Sir Peter Coats to provide his native town with a suitable building as a Museum and Library, for the reception of the vast number of specimens shown in Natural History, Antiquity, and Art.

When Mr. Young was unanimously appointed Curator of the Museum in 1871, it was felt that no better choice could have been made. He was not only a man of considerable education, but was by disposition an enthusiastic naturalist who loved his work. His own collections were at once gifted to the Museum, and he entered with heart and

soul into the work of arranging and classifying the vast number of natural history objects which were received from many sources. To Mr. Young's indefatigable energy and skill is due the credit of getting together the very fine collection of birds, British and foreign. More than this, he was a very skilful taxidermist, and was able, during his long service of twenty-six years, to save the Museum authorities a great deal of expense.

As Curator, Mr. Young had only one day in each week in which to collect, and these days he devoted to the collection of the orders of insects, etc., not represented in the Museum. He added a good collection of spiders; made a fine collection of fish, mounted in a style peculiarly his own. He took up the various orders of insects—Hymenoptera, Hemiptera, Diptera, Orthoptera, etc., and the seldom studied branches Anoplura and Mallophaga. His name appears frequently on the pages of Murray's "Catalogue of Scottish Coleoptera" (1853); Fowler's "Coleoptera of the British Isles" (1887-91); Edward's "Hemiptera-Homoptera of the British Isles" (1896), etc.; and he also contributed to numerous scientific journals.

Mr. Young was a Fellow of the Entomological Society, but his modesty was such that he seldom used the title.

All Mr. Young's energies were expended on his beloved Museum. He looked upon it as *his* Museum—*his* birds, *his* insects, *his* flowers. He was unmarried, but the Museum, with its birds, its beasts, and its plants, and, above all, with its insects, held for him some of the joys which others find in the domestic circle. Like many of the older zoologists, he loved the old ways and the beaten paths, and had very little sympathy with modern scientific theories. With the theory of evolution, for example, and its principles of development and adaptation to circumstances, he had little patience. The mere mention of Darwin's name to him was like waving a red flag before a bull—not that he did not admire Darwin, but because the theory of evolution of which Darwin was the author was to him heresy unpardonable.

The meeting of kindred spirits was, perhaps, never better shown than on the introduction of Thomas Edwards, the Banffshire naturalist, and Mr. Young. Mr. Edwards visited

Paisley shortly before his death, mainly to meet our Curator. Edwards was introduced by a mutual friend one morning, and left with Mr. Young, with the strict injunction to mind dinner. Dinner-time came, but no Edwards. Three o'clock, four o'clock, and still Edwards had not come. Edwards's friend now made sure something must be wrong, and off he rushed to the Museum, only to find two "old men eloquent" over bird and beast. After a great effort, he got Edwards away with him, grunting: "Dinner might ha' waited for anither hour; for its no aye ane gets sic a gran' crack."

Mr. Young was wont to tell of one of his experiences on the top of Ben Lomond. He had ascended the mountain in search of some species of Alpine beetles. He determined to remain on the top all night, and lying down under what little shelter he could get, he soon fell fast asleep. Early in the morning he was awakened by some heavy drops falling upon his face, and when, in his dazed condition, he looked around, he imagined he was placed among some islands in the midst of the ocean. When fully awake, he knew that a thunderstorm was raging in the valley below. What to his dazed senses seemed to be islands appearing above the ocean were but the tops of the neighbouring hills, seen in the bright sunshine, rising above the gray-coloured clouds. A drenching to Mr. Young, however, was nothing if he got his collecting-boxes filled. One feature of Mr. Young's character which is not generally known is that he was passionately fond of music, and a not unacceptable player on the violin.

Mr. Young was by nature very reserved on private matters. Few entered his dwelling-house, and fewer still could take the liberty of asking personal questions. In short, apart from his profession as a schoolmaster, or on the subject of natural history, he was a recluse, spending all his spare time in the country as far as possible from the busy haunts of men.

In the Museum, however, to ask Mr. Young a question was to honour him, not to trouble him. Nothing delighted him more than to be asked about the habits of some beast, bird, or insect; and, though he did not often lecture publicly, his talk about any topic in natural history was extremely

interesting and replete with knowledge. Mr. Young was ever ready to direct the footsteps of any young naturalist, and would look up and show in his own valuable collection of scientific books anything about which another had a difficulty. In 1887 Mr. Young took a great notion to become a microscopist and for a considerable time he spent his Wednesday evenings with two of the compilers, learning the mysteries of that instrument and its application to photography. His instrument, which was a valuable one, is one of the many things he bequeathed to the Museum.

Owing to the death of a brother a few years ago, Mr. Young came into a good deal of private means, which he did not hesitate to use in the interests of his especial work.

On his death it was found that all his valuable scientific books had been left to the Institution, as well as the sum of £500, the interest of which was to be expended on his favourite division of natural history.

Mr. Young's trustees have presented a carbon enlargement of him to the Museum, while the Museum Committee lately acquired a painting of him by a local artist. In it Mr. Young is represented as putting the finishing touches to a heron. It is intended that the picture be placed in some prominent part of the building over which he ruled for twenty-six years. It will always be present, but we shall miss his kindly characteristic figure within its familiar haunts, and those who knew him best will long remember him as an eminently lovable and good man. The well-known lines with which we close might surely be his epitaph:

> He prayeth best who loveth best
> All things both great and small.

[The above is communicated by a small Committee of the Paisley Naturalists' Society, consisting of Messrs. Dunsmore, Mure, Taylor, and Finnie, for which we tender our acknowledgments.—EDS.]

THE LATE GEORGE WILLIAM TRAILL

WAS the son of William Traill of Westness and Woodwick in Orkney, and younger brother of Dr. William Traill, of whom a brief obituary notice is contained in the "Scottish Naturalist" of April 1887. The love of Nature was strong in both, but while the elder brother preferred zoological studies the younger gave his chief attention to the seaweeds of the East Coast and North of Scotland. Born in 1836, he became a clerk in the head office of the Standard Life Assurance Company, and remained forty-two years in that employment. Though not of robust health, he did much to add to our knowledge of the Algæ of the shores on both sides of the Firth of Forth, and of the Orkney Islands, and published the results of his investigations in papers of which a list is subjoined. In these, the amount of information about the environment and economy is very noteworthy. He also wrote "An Elementary Treatise on Quartz and Opal." He died at Joppa, near Edinburgh, on 7th April 1897, leaving a widow, two sons, and one daughter.

List of Papers.

'The Algæ of the Firth of Forth' ("Edin. Phys. Soc. Proc.," 1880, pp. 171-189; 1881, pp. 96-97; 1883, pp. 188-190, 306).

'An Alphabetical List of the Parasitic Algæ of the Firth of Forth' ("Proc. Roy. Dublin Soc.," 1883, pp. 286-297).

"A Monograph of the Algæ of the Firth of Forth," 4to, 18 pages, with herbarium specimens of the rarer species: Edinburgh, 1885.

'The Marine Algæ of Joppa' ("Trans. Bot. Soc. Edin.," 1886, pp. 395-402).

'The Marine Algæ of Elie' ("Trans. Bot. Soc. Edin.," 1888, pp. 156-173).

'On the Fructification of Sphacelaria radicans' ("Trans. Bot. Soc. Edin.," 1888, pp. 77-78).

'Notes on New and Rare Algæ' ("Trans. Bot. Soc. Edin.," 1888, pp. 312-313).

'The Marine Algæ of the Dunbar Coast' ("Trans. Bot. Soc. Edin.," 1890, pp. 274-300).

'The Marine Algæ of the Orkney Islands' ("Trans. Bot. Soc. Edin.," 1890, pp. 302-342).

'Supplementary Notes on the Marine Algæ of the Orkney Islands, —South Ronaldshay' ("Trans. Bot. Soc. Edin.," 1892, pp. 544-546); 'North Ronaldshay' (*l.c.*, 1895, pp. 341-345).

Several of these papers were issued also in separate form as reprints, and some of these were illustrated with dried herbarium specimens.

THE LATE WILLIAM ARCHER, F.R.S.

William Archer, F.R.S., from 1876 to 1895 Librarian to the Royal Dublin Society, made several visits to Scotland, and for the most part in collaboration with Dr. John Roy of Aberdeen did excellent work in the investigation of the microscopic Algæ of our country. A short account of his life and his scientific work is given in the "Irish Naturalist," October 1897, pp. 253-257, with a portrait. He was born on 6th May 1830, and died on 14th August 1897, having been an invalid for a considerable time before his death.

ON THE MINOR FAUNAL AREAS.

By J. A. Harvie-Brown.

At the present time naturalists are endeavouring to arrive at conclusions regarding certain groups of phenomena relating to animal life, which phenomena have every appearance of being intimately associated with one another. These are: Bird Flight, Migration, Dispersal, and Distribution.

As a first means towards their study I have long advocated the subdivision of larger areas into smaller sub-areas, and have illustrated my contention by treating this country of Scotland in such a manner. I have defined what we may call "the Minor Faunal Areas of Scotland" from topographical and faunal standpoints.

I do not consider it necessary to enumerate these by name, except in so far as may be required to illustrate the present

paper. I believe they have been accepted with a very fair amount of unanimity as useful aids in the directions indicated.

In Buckley's and my own series of volumes "On the Vertebrate Fauna of Scotland," we have adopted the areas promulgated by the late Dr. Buchanan White ("Scot. Nat.," i. p. 160). But I already realise that certain modifications will be desirable. But I claim some small degree of usefulness in these early attempts, in the light that they have had some educative influence, and have given some impetus and energy in the further development of local work. I would desire to see attempts made to define Natural Areas in England and Ireland as well as in Scotland.

The Rev. H. A. Macpherson has adopted Mr. H. C. Watson's province for his "Fauna of Lakeland" (*i.e.* the lake land of the north-west of England), chiefly comprised within the political boundaries of the three counties of Cumberland, Westmoreland, and North Lancaster. Even I, who live at a distance, fancy I could point out *at least* six Natural Faunal Areas of the rest of Great Britain, though without local knowledge I could not describe them in detail.

I do not desire here to enter into the question—at least in detail—whether the areas which we have defined in Scotland satisfy the botanists or geologists. I only wish to advocate "method" from a faunal standpoint, though I might discuss, from our restricted horizon, the aptitude of the botanists' definitions of floral areas both of Scotland, England, and Ireland; but that is not my object now, any more than it is my province to do so.

Possibly in course of time (and time must be given) botanists may agree as to the final outcome of plant distribution and dispersal, geologists may reconcile their differences, zoologists may arrive at many mutual conclusions on different lines or groups of inquiry, and a platform common to all be raised from whence to advocate a more general and more generous unanimity.[1]

[1] I desire to point out here that by "Minor Faunal Areas" I do not mean to include still smaller areas which more correctly claim their treatment under descriptive topography, as has been done by many able writers, amongst whom I would place pre-eminently the admirable work of the late Mr. Stevenson in his "Birds of Norfolk." His "Introduction" still stands foremost as an English classic in this direction.

If we are to build up a satisfying structure, subjects must be studied from small beginnings, and pursued to bolder generalisations. Such works, we believe, as general maps and treatises, built upon hypothetical foundations, or imperfect data, even as regards the general subject of the migration of our British birds, are premature and rashly published. In some instances they are worse, being plausible but decidedly erroneous, and calculated to encourage a purely theoretical school at the expense of real scientific work. Scientific work I hold to be simply an accumulation of facts, combined with the ability to draw fairly accurate deductions from them; and in this opinion I believe I am supported by a very different school of authorities from those who attempt "the higher flights."

I have said it is scarcely our province to meddle with the geological aspects of the subject, yet we venture—subject to correction—upon a few remarks.

It is true, no doubt, that geology may—and probably does—influence several conditions of plant and animal life; but that it does so to any such extent as to decide faunal areas with permanency, beyond what may be termed topographical or surface geology, or such as subsidence of land or the upheaval of the same, we find it difficult to realise. A great geological fault may be found to divide plant- and faunal-areas from one another with considerable distinctness; and, for instance, a great range of mountain limestone, growing plants and general vegetation peculiar to, or characteristic of, limestone tracts, may—and no doubt does—influence the insect and even the bird life along its course; but I find difficulty in believing that it does so to an extent which would warrant the separation of faunal areas by the aid of geology as regards presently existing animals. Nevertheless, some useful keystones may yet be placed in position by the reconciling efforts of the students of these several branches of inquiry. I do not consider myself competent to say more.

The Minor Faunal Areas of Scotland are at present defined either by the names of the principal river basins or from their isolated positions. "Dee," "Forth," "Clyde" are examples of the former, and "Outer Hebrides," "Orkney,"

"Shetland" are examples of the latter; whilst another group is indicated from their somewhat more general geographical position, independent of their great watersheds—and including these—such as "Moray," "Sutherland," "West Ross," or "Argyll."

The definitions in the case of those which contain the drainage areas of one great river and its tributaries are—*skylines* and *watersheds*, over higher or lower cols or passes. "Dee" is an example of a higher, and "Forth" and "Clyde" examples of the lower. Those which are most useful as aids in the study of migration and dispersal are of the former group, because their areas are more easily described and mapped. Insular areas are easily studied, and their peculiarities or influences—if such exist—are most easily traced. The larger areas, which contain within their boundaries many minor river valleys and much rugged ground of different altitudes and varying characters, are *less* easy to define and map out. "West Ross" and "Argyll" are examples of such, and therefore present divisions laid down between these for convenience in treatment of details may be considered somewhat arbitrary, such as the division between "West Ross" and "Argyll." But, on the other hand, "Moray," though very extensive and embracing the basins of many large rivers,—the Deveron, the Spey, the Findhorn, the Ness, the Beauly, the Conon, and their tributaries,—is nevertheless a clearly defined area, enclosed by an encircling rim of the highest mountains of the country, *whence all these streams descend*, and which rim encircles all their sources; and this area is also well defined by a deeply indented coastline and basin, *into which all these rivers flow*, between sharply prominent and embracing arms or headlands of the coast.

Having thus endeavoured to give our reasons for the belief that is within us, we pass on to the next point in our inquiry.

Within our areas we must pay minute attention to the Faunal Value of each of the inhabitants—that is, we must catalogue all British species which occupy or visit each. This is being done with the object in view of comparing their numbers, their increase or decrease, their seasons of arrival and departure, their dates of first appearance, their

actual routes and passages on their migrations—one area with another, and each with each. Such investigations have already led up to conclusions regarding the phenomena of the dispersal of species, and also to some knowledge of their possible, probable, or certain original headquarters. (The latter point, of course, is arrived at by a comparison with distribution and statistics outside our presently treated of areas, by the observations of Continental naturalists, or of personal observations conducted and recorded by the travelled naturalists of our own country abroad, etc.)

Another step in the right direction, and with the same ends in view, has been initiated by the British Association's "Committee on the Migration of Birds" at lighthouses, as shown by the nine reports published between 1879 and 1887 inclusive, and the digest of these published in 1896, worked over again from the whole of the original schedules by the unbiassed work of Mr. Eagle Clarke, and delivered at the British Association Meeting at Liverpool in that year.

Yet another step has been taken, still with the same ends in view, viz.: by a treatment of single species both as regards past and present distribution, by calling in the assistance of the earliest records of appearances, by mapping these under a series of chronological dates, and (so far as such a method can be relied upon) by tracing out the various "avenues of advance" along "the lines of least resistance" or "greatest facilities" resultant upon the "natural increase of species" and "overflows from congested districts and centres."

To illustrate the facts from as many standpoints as possible has been among my first cares in contributing material. I have tried to select examples under very different circumstances as attached to the history of each.

I may be allowed to attempt to further illustrate this by placing my examples in juxtaposition.

First, I selected the Capercaillie[1] as an example. This giant grouse became *extinct* in Britain; but after a *restoration* at Taymouth and at several other *centres of introduction*, *dispersed* over large areas of suitable country along certain

[1] "The Capercaillie in Scotland." (Edinburgh: David Douglas, 1879.)

defined "*avenues of advance*," which I ventured to designate "*lines of least resistance*."

Next, I followed with a mammal—the Squirrel.[1] This animal similarly became *extinct* over a great area of Scotland, but probably lingered in one old timbered tract of *Moray*. It became *resuscitated* by various *re-introductions*, and we traced its *increase* and *extension of range*, not only from these centres, but also, as we believe, from the centre of its resuscitation, caused by the planting of young timber in close proximity to its indigenous haunts in the old pine woods of Rothiemurchus, Abernethy, and Glen Feshie of Spey.

Again, I illustrated the decline of certain species—partly owing to the intervention of man, partly to changing circumstances among their native haunts, and other causes—in a paper upon the "Past and Present Distribution of some of the Rarer Animals of Scotland,"[2] and in a paper upon the 'Great Spotted Woodpecker in Scotland"[3]—a species once again endeavouring to reach into Scotland through our south-eastern Border counties in late years.

I *next* followed with a series of papers upon the increase and extension of range of several carefully selected species, to show the varying avenues of approach and the circumstances affecting each species.

Thus the Stock Dove[4] reached north and along our East Coast. The Redstart,[5] long a breeding species in England and the south, suddenly increased and spread north by a peculiarly sinuous course, though one fairly accurately defined, crossing between "Forth" and "Clyde," and then passing up the West Coast through Argyll, increasing rapidly in 1890 or thereabouts, crossed the dividing low cols between

[1] "The History of the Squirrel in Great Britain." (Edinburgh: M'Farlane and Erskine, 1881.)

[2] Reprinted from "Zoologist," 1881, pp. 8-23, 81-90, 161-171; and 1882, pp. 1-9, 41-45; including notices of the (1) Wild Cat, (2) the Marten, (3) the Polecat, and (4) the Badger.

[3] 'On the Decrease of the Great Spotted Woodpecker in Scotland,' reprinted from the "Zoologist," 1880, pp. 85-89; and a later paper on the same subject, "Ann. Scot. Nat. Hist.," January 1892, pp. 5-17.

[4] 'On the Stock Dove,' etc., "Proc. Roy. Phys. Soc. Edin.," 1883, pp. 54-66.

[5] See "A Vertebrate Fauna of the Moray Basin" (Edinburgh: David Douglas, 1895), under the species, vol. i. pp. 227-233.

Argyll and Spey, populated the whole length of these great depressions, until it *swarmed* by 1891 and 1892 right down to the pine forests on the shores of the Moray Firth, and *later* beginning to ascend the valleys of the tributary streams and glens, reaching also far down the Great Glen to Inverness by 1895 (*loc. cit.* p. 232). Strange it is to find the Redstart, known as yet only in one district in the south-east of Ireland, and so rare in the western counties of England and in Wales.

The more complicated advances also of the Starling[1] claimed my attention and revealed the distinct evidences of a double invasion: one from the south and south-east, and a much earlier one from the north and north-west and north-east. This was a most interesting study, especially if taken along with the facts known as regards the former distribution of now extinct animals in Ireland (Scharff, "Proc. Roy. Irish Acad.," (3) iv. p. 427 (1897).

Of other species which have passed under review I may instance a few as of extreme interest, viz. the Tufted Duck,[2] which rapidly, of late years, has populated our lakes from southern approaches: one avenue *via* the East Coast, and another *via* Ireland and the West Coast; curiously missing out the Moray area (as yet) and leaping, as it were, across from "Dee" to Caithness. The Goosander[3] may be instanced as coming down our West Coast, leaving out the barren Outer Hebrides, filling our west glens, surging over the highest cols of the backbone of Scotland, flooding the great eastern valleys, and still annually pursuing an easterly course along the low haughs of the Laigh of Moray and penetrating to most of the great forests of Spey, etc. The Red-breasted Merganser[4] is another which came by similar routes, but first populated the Outer Islands, finding the peat cracks and crevices of the Long Island suitable to its requirements. And we could instance many others not less interesting—and may yet do so in another place.

Finally, interest can be given further by a study of

[1] 'The Starling in Scotland,' etc., "Ann. Scot. Nat. Hist.," January 1895, Plate I., pp. 2-22.

[2] 'The Tufted Duck in Scotland,' etc., "Ann. Scot. Nat. Hist.," January 1896, map, pp. 3-22.

[3] *Vide* "Fauna of Moray Basin," vol. ii. pp. 117-120 (Hinxman).

[4] *Loc. cit.* pp. 120-122.

individual birds and species, and field observations on their flight and actions. We can instance the arrival of the noisy Oyster-catcher—most blatant of birds—at the annual and favourite nesting sites, as well as their equally noisy departures and movements in autumn. Many times have I also seen the surging to and fro—to the north, and then to the south—of many migrants in the valley of the great rivers of North Russia—influenced one day by a warm sun and the melting of the snows, and the next hurrying back upon their tracks, fleeing for a space away from the next temporary grasp of the Ice King.

In conclusion, I wish to emphasise the intimate connections existing between the initial phases of bird flight, the greater migrations, the increase of species, and their dispersal ; and, in order to illustrate the connection with our neighbouring Continent and its avifauna, we add here a short extract from W. Eagle Clarke's Digest, provided by him at my request, and recommend such of our readers as have not perused the full Digest to do so if they wish to learn more.

I trust we have shown some uses for the division of larger areas into smaller ones—the principal object of this paper.

I. *Intermigration between Britain and Northern Continental Europe.*—Autumn migrants cross the North Sea and arrive on the east shores of Britain at points between the Shetland Isles and the Humber or the Wash (including the northern seaboard of Norfolk). These immigrants and emigrants from and to Northern Europe pass and repass between this portion of the Continent and Britain by crossing the North Sea in autumn in a south-westerly direction, and in spring in a north-easterly one,[1] and that, while the limit to their flight on the north is the Shetland Islands, that on the south extends to the coast of Norfolk.[2] During these movements the more southern portion of the east coast of England is reached *after* the arrival of the immigrants on the more northern portions.

[1] The direction varies. It is probably more westerly (in autumn) or easterly (in spring) at the most northern British stations, and south-south-westerly (in autumn) or north-north-easterly (in spring) at the stations on the east coast of England.

[2] The formation adopted by the migrants during passage would seem to be an extended line—perhaps a series of lines—whose right wing extends to the Northern Islands and its left wing to the coast of Norfolk.

After arriving on our eastern shores, these immigrants from the north—some of them after resting for a while—move either down the south-eastern coast of England, *en route* for more southern winter quarters, or, if winter visitors, to their accustomed haunts in Britain and Ireland. A few occur as birds of passage on the west coast and in Ireland, which they reach by overland routes across Britain, and then pass southwards to their winter quarters. The west coasts, however, do not receive *directly* any immigrants from Continental Europe.

Thus, so far as concerns the movements of the birds of passage to and from their northern breeding haunts, the British east and west coast migratory movements are very distinct in their characters. The west coast does not receive immigrants direct from Europe, nor do these Continental breeding species depart from its shores in the spring.

II. *Intermigration between the South-east Coast of England and the Coast of Western Europe*—'*East and West Route*.'—There is a considerable amount of migration observed at the lightships and lighthouses between the Kentish coast and the Wash, flowing from the south-east to the north-west, not infrequently from east to west, across the southern waters of the North Sea. From the stations off the mouth of the Thames as a centre, the birds either sweep up the east coast, sometimes to and beyond the Tees (many proceeding inland as they go), or pass to the west along the southern shores of England.

III. *Intermigration between Britain and Færoe, Iceland, and Greenland*.—Færoe, Iceland, and Greenland are the summer home of several species (Wheatear, White Wagtail, and Whimbrel) which occur as birds of passage on the British coasts. These birds being of strictly Old World species, our Islands lie in the course of their migrations. It is quite possible that these migrants may pass along both the eastern and western coasts of Britain and the coasts of Ireland. Here, at any rate, we have evidence that these birds are observed on passage on our western shores. There is good evidence that important movements of Redwings, Wheatears, and Whimbrels are observed on the western coast of Great Britain and the Irish coasts (both east and west as regards the passage of the Whimbrel) which are not observed elsewhere. Such a fact points to the independent nature of these west coast flights, and indicates that in some instances at least the western route alone is followed.

ON HYBRIDS BETWEEN THE CAPERCAILLIE AND THE PHEASANT.

By Wm. Eagle Clarke.

The fourth known example of the remarkable hybrid resulting from a cross between the Capercaillie (*Tetrao urogallus*) and the Pheasant (*Phasianus colchicus*) is worthy of more than a mere record, not only on account of the extreme rarity of such specimens, but chiefly because there is now material for a contribution towards a knowledge of the morphological variations and the peculiarities in coloration presented by such hybrids.

Only four such specimens are known, and all of these have been obtained in Scotland.

M. Suchetet, in his recently published (1897) work on "Des Hybrides à l'Etat Sauvage (Classe des Oiseaux)," only records two examples,—the specimens in the collections of the Hon. Walter Rothschild and Sir Arthur Grant,—overlooking the first recorded bird in the collection of Mr. James Lumsden.

In the "Scottish Naturalist" (1891, p. 39) I described the first known hybrid. Now, thanks to Mr. Harvie-Brown, I have had the opportunity of examining and describing the latest specimen, which Mr. Harvie-Brown is about to present to the bird collections in the Museum of Science and Art, Edinburgh.

The bird under consideration was obtained in the middle of September last at Stronchullin, Blairmore, S.E. Argyllshire, where it had been observed for eighteen months, and was sent to Mr. Harvie-Brown by Mr. G. H. Black.

This bird, a male, resembles a huge Pheasant, being $33\frac{3}{8}$ inches in length from the bill to the end of the tail, which latter is not fully developed, as the bird is in deep moult; the wing, 12.5 inches; culmen, 1.5 inches; depth of bill, 0.7 inches.

Head and upper neck greenish black, slightly glossy, with a dull buff central spot on each feather; the eyes surrounded by a large patch of scarlet. Lower neck

glossy dark green. BREAST black, with a green gloss, vermiculated with dull buff, the whole forming a conspicuous pectoral band. ABDOMEN glossy dark green, boldly but irregularly marked with buff on its upper part; the feathers only edged with buff on the lower part. FLANKS dull black, spotted and edged with buff. UNDER TAIL COVERTS dusky, and barred with buff on the central coverts, and with dark rufous on the lateral coverts. MANTLE, BACK, SCAPULARS, and WING COVERTS dull buff, finely vermiculated and edged with black washed with glossy green. UPPER TAIL COVERTS similar, but washed with rufous brown. WINGS: primaries dusky, the outer web white streaked with gray, the inner web with vermiculated bands of buff; secondaries also dusky, with wavy bands of buff. Axillaries and minor under wing coverts bright buff, blotched with dusky towards their bases; greater series dove-coloured, finely vermiculated with a darker tint of the same colour. THIGHS buff, with dull black bars. TAIL in deep moult, but the central pair of feathers, which are considerably elongated, black finely vermiculated with buff in the centre, laterally deep rufous finely vermiculated with black. The remaining tail feathers are short and black, edged and marked with buff on the basal portion of their outer margins. Thus these feathers entirely lack the characteristic and conspicuous oblique bars which adorn the tail feathers of the Pheasant, and differ considerably, both in colour and form, from the tail of either of the parent species.

The TARSO-METATARSUS is an interesting mixture of the characteristics of both parents, inasmuch as it is feathered on the upper half of its frontal aspect. The spur is represented by a mere nodule, and is scarcely noticeable. The FOOT is a Pheasant's, but the hallux is on the same plane as the front toes, and not slightly elevated as in that species.

Mr. Lumsden's bird was shot on his estate at Arden, in Dumbartonshire, on the 8th November 1890, when in company with some Pheasants, and is the bird figured by Mr. J. G. Millais in his "Game Birds." It also is a male, and in general appearance it resembles a cock Capercaillie with the tail of a Pheasant. The well-developed beard, the deeply

hooked bill, and the conspicuous white patch near the shoulder are all pronounced characteristics of the Capercaillie. The HEAD is that of a cock Capercaillie, but has the large naked vermilion space around the eyes of the male Pheasant. The tarsus agrees with that of the bird already described. The tail is cuneate, but not pronouncedly so, as in the Pheasant. In colour, the HEAD has the crown and hind neck green with dull yellow margins, the sides of the head green with dull yellow spots. BREAST dark glossy green. Feathers of the ABDOMEN and FLANKS barred with green and dull yellow, the green predominating. UPPER SURFACE resembles that of the cock Capercaillie, but the vermiculations are coarser and of a dull yellowish tint. WINGS a mixture of buff and black, the primaries on their outer margins barred with pale brown, as in the Pheasant. The TAIL FEATHERS black, barred with pale brown. The TARSUS is only feathered on its upper part, the lower portion being scutellate, with a nodule or rudimentary spur on its hinder surface. The TOES are those of a Pheasant.

The second example, now in the fine collection of the Hon. Mr. Rothschild at Tring, was, according to the information supplied to M. Suchetet (*op. cit.* p. 62), killed in a wild state at Aiden [Arden], Loch Lomond, Scotland, in December 1890, "in a lonely forest far from any pheasantry." It will be observed that this specimen was not only obtained in the same locality as Mr. Lumsden's, but also that it was shot a few weeks after the capture of that example. I am told, too, that Mr. Rothschild's bird closely resembles Mr. Lumsden's specimen both in form and coloration, and there can be little doubt, I think, that these birds were brothers. M. Suchetet is wrong, however, when he states (pp. 622, 944) that Mr. Rothschild's specimen is the one figured by Mr. Millais in his "Game Birds" (p. 20).

The third specimen is a young male, and was shot at Monymusk, in Mid-Aberdeenshire, on the property of Sir Arthur Grant, Bart., in whose possession it now is, "at the end of the past year" (1895). This bird was recorded in this magazine ("Annals," 1896, p. 123) by Mr. George Sim, ho thus describes it: "The bird is much above the usual

size of the Pheasant. The form of the HEAD, BEAK, and FEET are like that bird. The TAIL, in shape and marking, is also like the Pheasant, but not quite so long. The feathers of the BACK are marked like the Capercaillie, but tinged with the golden brown of the Pheasant. The NECK, BREAST, and ABDOMEN are wholly coloured as in the Capercaillie, and the TARSUS is feathered for half its length."

Lastly, we have the fourth specimen already described.

It is evident from the foregoing descriptions of these hybrids that they represent two morphologically distinct types. These are peculiar and partake of the characteristics of both parents in a greater or lesser degree.

The first we have is the type least modified in appearance, being pheasant-like in form, as in the third and fourth specimens described. There are, however, important tetraonine modifications. These are the partially feathered tarsus, with its merely rudimentary spur; the hallux on the same plane as the front toes; while in one of the specimens the formation of the tail is peculiar, only the central pair of feathers being elongated.

The second type of form is a mixture of Capercaillie and Pheasant, and may be said to be a Capercaillie with the tail and feet of a Pheasant. Other phasianine peculiarities are to be found in the scarlet eye-patches, and the partially scutellate tarsus with its nodule or rudiment of a spur.

The question of coloration presents great difficulties; and it is almost impossible to institute useful comparisons, and quite so to formulate colour types.

There exists, however, a great resemblance between the two Arden specimens. That this should be so is not unnatural, for there can be little doubt that these birds were members of the same brood. I say not unnatural, but it certainly does not follow as a matter of course, for I know of two male hybrids between a Pheasant and a Domestic Fowl, members of one family, which are as different in coloration as it is possible for them to be.

In coloration the two pheasant-like birds differ widely. The Monymusk specimen is described as resembling the

Capercaillie in the coloration of its under surface, and, to a great extent, the same may be said of the back also.

The fourth, or Stronchullin, example decidedly presents the greatest departure from the typical coloration of either of its parental forms. Its feather regions have their colours strangely modified, so that few of the plumes can be regarded as typical of either Capercaillie or Pheasant. It is not, however, a bird of beauty ; and though a fine creature, it is certainly not so from wearing the proverbial fine feathers.

It will have been noted that all the known specimens of this hybrid between the Capercaillie and the Pheasant are of the male sex. This may, perhaps, be accounted for by the fact that such birds naturally fall under the observation of sportsmen, many of whom would not be likely to detect in the sombre plumage of the female of this hybrid an extremely rare bird ; or it may be such a specimen might be considered to belong to a commoner cross.

In conclusion, it remains to be stated that nothing whatever is known of the sex of the particular parent species from which any of these interesting hybrids have sprung. This, however, was not to be expected, since one and all of these crossbred birds are the offspring of wild parents.

NOTES ON THE BIRDS OF ETTRICK.

By Peter Adair.

The present paper has been compiled from observations made on the bird-life of Ettrick, in the course of annual visits which have been made to that district during the past twenty years. These visits, each of which lasted several days, occurred, as a rule, in June ; but on several occasions additional incursions were made in autumn and in spring.

The area is most interesting to the ornithologist ; and, what is of consequence, it is easy of access during the summer months by rail and coach.

The river Ettrick has its source in Capel Fell, a high hill at the south-western extremity of Selkirkshire, and after a

winding north-easterly course of some thirty-three miles it falls into Tweed two and a half miles below the town of Selkirk. In its course it is joined by numerous hill burns, two of which—Tima and Rankle Burn—have courses of some seven and ten miles respectively ; and by Yarrow (which has a course of fourteen and a half miles from St. Mary's Loch) two miles above Selkirk. Yarrow I have simply driven through, never resided in, so that these notes have only a very limited application to that area.

The valley of Ettrick, which is, as a rule, narrow, is bounded on either side, from the grounds of Bowhill (the seat of the Duke of Buccleuch) upwards, by wave after wave of hills, generally green, and often high, with peat in many instances on their shoulders and summits. The area under cultivation is small, but the slopes are, as a rule, well wooded from Tweed as far south as Shaws (the residence of Mr. Scott Anderson). Between Shaws and Thirlestane Castle (the seat of Lord Napier and Ettrick) there are several scattered plantations ; and at Thirlestane Castle the valley and slopes are finely wooded, and many of the trees are well-grown, beautiful specimens.

It will accordingly be inferred that the conditions of bird-life are not unfavourable, and such is the case. The list annexed does not pretend to be exhaustive. It is a simple record of what has been observed during a limited period of each year by myself, or seen by others whose names I give. Were attentive observations made during longer periods of each year, and in autumn and spring, many additions might be made to the list of 91 species which is annexed.

Missel Thrush, *Turdus viscivorus*.—Occurs in scattered pairs as far up the river as Thirlestane.

Song Thrush, *Turdus musicus*.—Fairly common in every wood and brake over the whole area. Less numerous than formerly during seasons 1895, 1896, and 1897.

Redwing, *Turdus iliacus*.—Common in autumn.

Fieldfare, *Turdus pilaris*.—Parties in autumn and spring.

Blackbird, *Turdus merula*.—Common over the whole area up to Cossarshill.

Ring Ouzel, *Turdus torquatus*.—A few pairs during the nesting season on suitable ground.

Wheatear, *Saxicola œnanthe.*—This is one of the earliest of the spring visitors. During the nesting season it is distributed over the whole area in considerable numbers.

Whinchat, *Pratincola rubetra.*—A common bird on suitable ground.

Stonechat, *Pratincola rubicola.*—Scarce. I have seen the bird occasionally on the face of the hill above Ramsaycleuch.

Redstart, *Ruticilla phœnicurus.*—This most attractive bird is distributed over the whole area during the nesting season, in every suitable wood and brake.

Redbreast, *Erithacus rubecula.*—Common.

Whitethroat, *Sylvia cinerea.*—Common during the nesting season.

Blackcap, *Sylvia atricapilla.*—This charming songster is a feature of the wooded parts of the valley from Tweed to Thirlestane. A number frequent the beautiful grounds at Bowhill and Haining, and birds are always heard in the summer season from the public road at Oakwood, Kirkhope, Shaws, Singlie, Cacrabank, and Thirlestane. One of the most delightful and memorable incidents of a drive in the valley on a genial June morning is the certainty of being electrified by its rapid, mellow notes in passing these haunts.

Garden Warbler, *Sylvia hortensis.*—Rare. Have heard it twice, once at Bowhill and on another occasion at Thirlestane.

Golden-crested Wren, *Regulus cristatus.*—Common in all the coniferous plantations.

Willow Wren, *Phylloscopus trochilus.*—Abundant.

Wood Wren, *Phylloscopus sibilatrix.*—A few pairs at Bowhill, Oakwood, and Thirlestane, and during the past two years a bird has been heard at Cacrabank.

Sedge Warbler, *Acrocephalus phragmitis.*—Abundant in spring and summer.

Grasshopper Warbler, *Locustella nævia.*—Have heard this bird twice in different years in June: once nearly opposite Annelshope farmhouse; on the other occasion in the rough pasture opposite Tushielaw farmhouse.

Hedge Sparrow, *Accentor modularis.*—Not plentiful.

Dipper, *Cinclus aquaticus.*—A few pairs on every stream.

Long-tailed Titmouse, *Acredula caudata.*—Scarce.

Great Titmouse, *Parus major.*—Common.

Coal Titmouse, *Parus ater.*—Fairly common.

Blue Titmouse, *Parus cœruleus.*—Common.

Wren, *Troglodytes parvulus.*—Common.

Tree Creeper, *Certhia familiaris.*—Seen occasionally.

Pied Wagtail, *Motacilla lugubris.*—Common.

Gray Wagtail, *Motacilla melanope.*—A few pairs of this beautiful species nest in the area, returning year by year to the same haunts.

Yellow Wagtail, *Motacilla raii.*—I saw a pair near Tushielaw Inn in the end of April 1889.

Tree Pipit, *Anthus trivialis.*—Common. A pair always near Tushielaw Inn. On going out of the inn on a genial morning in late spring or early summer, the first sound which falls on the ear is the note of this bird, which is immediately detected perched on the topmost twig of one of the tall roadside trees. From that point it, from time to time, soars and descends, pouring out during its flight its very pleasing song.

Meadow Pipit, *Anthus pratensis.*—Abundant.

Spotted Flycatcher, *Muscicapa grisola.*—A few pairs.

Swallow, *Hirundo rustica.*—Common.

Martin, *Chelidon urbica.*—Common.

Sand Martin, *Cotile riparia.*—Not so often seen as the two species last noticed.

Swift, *Cypselus apus.*—Fairly common.

House Sparrow, *Passer domesticus.*—Common.

Greenfinch, *Ligurinus chloris.*—Common.

Chaffinch, *Fringilla cœlebs.*—Abundant.

Linnet, *Acanthis cannabina.*—Scarce.

Lesser Redpoll, *Acanthis rufescens.*—Heard in autumn.

Bullfinch, *Pyrrhula europœa.*—Seen at Bowhill and at Thirlestane.

Corn Bunting, *Emberiza miliaria.*—Scarce.

Yellow Bunting, *Emberiza citrinella.*—Common.

Reed Bunting, *Emberiza schœniclus.*—A pair usually on all suitable ground.

Snow Bunting, *Plectrophenax nivalis.*—Common in autumn.

Starling, *Sturnus vulgaris.*—Common.

Magpie, *Pica rustica.*—A few pairs, particularly at Tushielaw and Thirlestane.

Jackdaw, *Corvus monedula.*—Common. A number of pairs nest in the rabbit burrows on the slope of the Kip on Crosslee Farm.

Raven, *Corvus corax.*—Seen occasionally.

Carrion Crow, *Corvus corone.*—Common.

Rook, *Corvus frugilegus.*—Abundant.

Skylark, *Alauda arvensis.*—Abundant.

Kingfisher, *Alcedo ispida.*—One seen on the river in 1895 at Carterhaugh.

Cuckoo, *Cuculus canorus.*—A few birds.

Barn Owl, *Strix flammea.*—My friend Mr. Alexander Sturrock, Craigmillar Park, informs me that he has seen this bird in Newark Tower.

Long-eared Owl, *Asio otus.*—Common.

Short-eared Owl, *Asio accipitrinus.*—During the years (1891-93) of the Vole Plague this beautiful and useful bird was abundant over the stricken area from Singlie to the watersheds. But with the entire subsidence in 1893 of the great wave of vole life, the bird almost entirely disappeared. In normal conditions of food supply it is very scarce in the district, though never entirely absent. I have not seen it every year: only occasionally. A permanent haunt is the grassy slopes near Clearburn Loch, and the haughs and hillsides from Tushielaw to the mouth of Tima. A fine bird was flushed last June in the latter area, out of a plantation on Annelshope, where it had been sitting on the ground at the side of a decaying Scotch fir-branch.

Tawny Owl, *Syrnium aluco.*—Common in all the larger woods.

Common Buzzard, *Buteo vulgaris.*—Occasionally seen.

Sparrow Hawk, *Accipiter nisus.*—A few pairs.

Peregrine Falcon, *Falco peregrinus.*—Once seen flying in a south-easterly direction.

Merlin, *Falco æsalon.*—A pair nested yearly, up till within the last six or seven years, on the face of a heathery brae on the farm of Wester Deloraine.

Kestrel, *Falco tinnunculus.*—Another bird which appeared in great numbers during the vole period and disappeared with the vole, except a few pairs. At present nearly every well-grown wood holds a pair, and two or three may be seen during a drive of an hour or two.

Common Heron, *Ardea cinerea.*—One or two seen on the occasion of every visit. I am informed that a few pairs nest at Thirlestane.

Mallard, *Anas boscas.*—A few pairs always nest.

Pintail Duck, *Dafila acuta.*—I saw a pair many years ago in the hands of Mr. Hope, birdstuffer, George Street, Edinburgh, which he informed me had been shot on the small lake in Bowhill grounds.

Teal, *Querquedula crecca.*—A few pairs nest, principally at the flat, marshy ground near Midgehope.

Wigeon, *Mareca penelope.*—Two pairs have nested each year for the past three years within the watersheds; but I think it as well not to communicate the exact locality. In dealing with this fine bird it is right to mention that it is decidedly increasing, and that it nests in every suitable loch on Alemuir which I have been able to visit. In June 1896, while examining one of the larger lochs, a flock passed of fourteen birds. I did not succeed in identifying the sex of the whole, but before the birds got into an unfavourable light I had made out, through a strong glass, that the nine rearmost ones were all drakes.

Tufted Duck, *Fuligula cristata.*—This beautiful little duck is a feature of the fine lake in Haining grounds. In the early winter of 1895 I counted fifty birds on that lake; and three or four pairs remain during the summer. The gamekeeper, however, informs me that he has never seen the young; but the presence of large pike in the lake may easily account for their absence.

Goosander, *Mergus merganser.*—A regular spring visitor. As I write, I have before me a case containing a fine pair which were shot on the river some years ago. I have never seen, or heard of, the bird frequenting the area during the nesting season.

Ring Dove, *Columba palumbus.*—Common. Greatly decreased of late years.

Black Grouse, *Tetrao tetrix.*—A fairly abundant species over the whole upper part of the area.

Red Grouse, *Lagopus scoticus.*—Abundant on all the heathery ground.

Pheasant, *Phasianus colchicus.*—Common.

Common Partridge, *Perdix cinerea.*—Fairly abundant over the cultivated area.

Land Rail, *Crex pratensis.*—Common.

Mere Hen, *Gallinula chloropus.*—A few pairs.

Coot, *Fulica atra.*—A few pairs.

Golden Plover, *Charadrius pluvialis.*—Distributed over the higher ground during the nesting season in considerable numbers.

Lapwing, *Vanellus vulgaris.*—Abundant during the nesting season.

Oyster-catcher, *Hæmatopus ostralegus.*—On one occasion I saw a single bird flying up the course of the river.

Woodcock, *Scolopax rusticula.*—Seen once in autumn. Mr. James Mathison, banker, Selkirk, and Mr. Martin, gamekeeper, Bowhill, inform me that a number nest in Bowhill Woods.

Common Snipe, *Gallinago cœlestis.*—Found on all suitable ground.

Dunlin, *Tringa alpina.*—A few pairs nest.

Common Sandpiper, *Totanus hypoleucus.*—Distributed during the nesting season over the whole course of the river.

Redshank, *Totanus calidris.*—Within the past ten years a number of pairs nest annually in the area.

Common Curlew, *Numenius arquata.*—On every hillside.

Black-headed Gull, *Larus ridibundus.*—A nesting-place at Haining. Numbers frequent the river during the spring and summer months in search of food.

Lesser Black-backed Gull, *Larus fuscus.*—Several frequent the valley during spring and summer; and these may be looked on, during their stay, as the most destructive winged vermin in the district, subsisting as they do to a great extent on smolts (during the smolt period) and trout, and on the young of game birds and wildfowl. As an instance of the rapacity and audacity of the species, in the end of last June, while angling on the Gladhouse Reservoir, Midlothian, an immature bird suddenly descended on four Teal, apparently two or three weeks old, which were feeding within 80 yards of us, near a rushy margin, caught one in its bill, and chased the remaining three to the shelter of the rushes, repeatedly jumping on one of the ducklings, but without success, as its bill was full. It then flew past us, within 50 yards, and, alighting on a sandy spit, at once gulped down the victim.

NOTE ON THE LIFE-HISTORY OF *LOCHMÆA SUTURALIS*: A BEETLE DESTRUCTIVE TO HEATHER.

By Percy H. Grimshaw, F.E.S.

On the 23rd of August last Mr. Archibald Fairbairn, of Wellwood, Muirkirk, Ayrshire, sent to the Museum for examination a root of heather infested with a small whitish grub, which he stated had destroyed many acres of good young heather in his district, causing the shoots to become quite withered and brown. Mr. Fairbairn also stated in the accompanying letter that he was inclined to think that this

plague is the cause of the popular idea of frosted heather. Upon a careful examination of the grub I became satisfied that it belonged to a species of phytophagous beetle, and even decided upon the family (*Galerucidæ*) to which it belonged, but with such scanty material could proceed no further. However, a few days afterwards the same gentleman very kindly sent me three large patches cut from the moor, two of them badly frosted and the third unaffected. From the two infested pieces I picked every day for the space of a week or so freshly emerged specimens of a beetle which I identified as *Lochmæa suturalis*, Thomson; and as a vast number of examples of this insect in all stages between that of full-grown larva and perfect insect were found buried amongst the roots of the heather, I was enabled satisfactorily to refer the damage to this species. As the life-history of the beetle does not appear to have been hitherto observed, so far as I can ascertain, I have thought it desirable to draw attention to it. Unfortunately, it was too late in the season to see anything of younger larvæ, so that all I can do at present is to furnish a short description of the full-grown larva and the subsequent stages. Fig. 1 shows a full-grown larva seen in profile and magnified. It is about five millimetres long, of a dirty white colour, with black head and legs. The surface is

Larva, pupa, and imago of *Lochmæa suturalis*, Thomson.

studded with small black tubercles, arranged in a double transverse row in each segment, and the segments themselves are transversely furrowed or wrinkled on the dorsal surface. Each tubercle is tipped with a fine bristle of a pale colour, while the black, shining head is furnished with similar bristles. The pupa as seen from beneath is represented in Fig 2, and the characteristic form of a phytophagous beetle is here

distinctly traceable. The body is still covered with bristly tubercles, though these are not nearly so prominent as in the larva. The legs are folded up close under the body, and the antennæ are beautifully curled under the two anterior pairs of legs and brought out again so as to show the tip of each close to the four anterior tarsi, the separate joints of the latter being quite distinctly seen. The posterior legs are folded under the wings, which are here in a rudimentary condition, though plainly to be seen as in the figure. The developing mouth-parts are seen just in front of the anterior tarsi.

The mature beetle is shown in Fig. 3. It is of a yellowish-brown colour, with black head, irregular blackish markings on the thorax, and black scutellum. The antennæ are about as long as the body, and black with the exception of the three basal joints, which are more or less testaceous. The first joint is much thickened, the second very short, the third the longest of all and rather slender, the rest somewhat cylindrical. The legs have the tibiæ testaceous, the femora and tarsi black. The head, thorax, and elytra are all finely punctured, while the first-named bears prominent shining black frontal tubercles. Fowler, in his "Coleoptera of the British Islands," says the beetle is occasionally entirely black, while the suture of the elytra is always dark. In all my specimens, however, there is no darkening of the suture whatever, and the colour corresponds well with the figure given by Fowler of *L. capreæ*, the only species with which it might be confounded. However, the prominent shining black tubercles on the front of the head afford a ready discriminating character, besides the fact that *L. capreæ* is found on willows, sallows, and birches, and not on heather. Redtenbacher's description of the species ("Fauna Austriaca," 3rd edition, 1874, Band ii. p. 488) corresponds much better with my specimens, for he says the thorax and elytra are "bräunlich graugelb, die Naht der letzteren dunkelbraun." Possibly my examples were killed somewhat early, and if kept longer the suture might have considerably darkened.

ADDITIONAL COLEOPTERA FROM THE SUMMIT OF BEN NEVIS, COLLECTED BY MR. W. S. BRUCE IN 1896.

Rev. A. Thornley, M.A., F.L.S., F.E.S.

Shortly before Mr. Bruce went away with the Jackson-Harmsworth Polar Expedition, he sent me a small box of insects collected chiefly during the month of May 1896. Amongst the Coleoptera were some very conspicuous species, all taken on, or close to, the summit of the mountain. For previous lists of insects from the locality, readers are referred to the January, April, and July numbers of this Magazine for 1896. The following is the list of additional species.

GEODEPHAGA.

Anisodactylus binotatus, *F.*—One example—type form.

Amara communis, *Panz.*—One example—a dark form.

BRACHELYTRA.

Aleochara moesta, *Grav.*—One example—a widely distributed species.

Megacronus cingulatus, *Maun.*—One example—an uncommon species.

HYDRADEPHAGA.

Rhantus bistriatus, *Berg.*—Two examples from the Tarn (2500 feet nearly).

Dytiscus lapponicus, *Gyll.*—A pair from the same locality.

STERNOXI.

Corymbites tesselatus, *F.*—One example.

CLAVICORNIA.

Anatis ocellata, *L.*—Two examples.

Adalia bipunctata, *L.*—Two examples—one a singular variety.

Omosita depressa, *L.*—One example.

Silpha rugosa, *L.*—One example.

MALACODERMA.

Telephorus pellucidus, *F.*—One example.

PHYTOPHAGA.

GASTROIDEA POLYGONI, *L.*—Six examples.

RHYNCHOPHORA.

ORCHESTES FAGI, *L.*—One example.

SCOLYTIDÆ.

MYELOPHILUS PINIPERDA, *L.*—Two examples.

HYLASTES ATER, *Payk.*—Two examples.

There were again several specimens of *Acidota crenata* and *Tachinus elongatus;* and also many examples of *Coccinella hieroglyphica*, which ran into curious varieties. *Corymbites cupreus* and *Lochmæa suturalis* occurred in some abundance. The Byrrhidæ were well represented by *B. fasciatus*, *B. pilula*, *B. dorsalis*, and *Cytilus*. Both *Donacia discolor* and *Silpha opaca* occurred again.

[CORRECTION.—In the first list of Coleoptera from this locality—given in the January 1896 number of this magazine, on page 36, No. 42—the six examples of a small form of *Telephorus lituratus* must be referred to the much rarer *Telephorus figuratus*, Fall. The impressed lines on the antennæ in the male are not always a very obvious feature.]

ON THE FLORA OF TIREE.

By SYMERS M. MACVICAR.

THE island of Tiree is the most westerly of the Inner Hebrides, and forms with Coll, Mull, and its adjacent islands, the "Mid Ebudes" of Watson. It is remarkable for its flatness and small elevation above sea level. According to the Old Statistical Account of 1794, its ancient name, translated into English, was, "The kingdom whose summits are lower than the waves." The same authority also mentions that the waves are often seen from the one shore rising several feet above the level of the other. Nearly the whole of the

island is less than 20 to 30 feet above sea level, the exceptions being three small hills about 400 feet high at the western end, while some parts are considerably under the 20 feet. In the centre of the island, and extending across it, is a large grassy plain, called the Reef, which is one of the natural curiosities of the West Coast. It has been described as being as level as a bowling-green, and although it has that appearance when viewed as a whole, it is seen on closer inspection to be slightly undulating. Martin, in his "Description of the Western Islands of Scotland" (1703), mentions that in his time the sea sometimes overflowed the whole of this pasture. In the Old Statistical Account it is stated that a barricade of stones, etc., was erected at one spot to prevent the island being divided into two, also that the storms had raised a high bank of stones in another place, "yet the impetuous surge sometimes baffles the whole." The Reef is bounded on one side by a broad channel of water, called the Fhaodhail, which has scarcely any perceptible current except at its exit, which is on the south shore. It was by means of this channel that the sea usually flooded the Reef, but this has not happened within living memory. The Rev. D. Maclean, Hylipol Manse, to whom I am indebted for much kind help, writes: "The salt water is still forced up the Fhaodhail a long distance in rough weather, and when there are unusually high tides. The mouth of the channel used to be blocked up by sand during the ebb to such an extent that a huge body of water lodged in the river for a considerable time afterwards; but this has been remedied to a certain extent by confining the exit to a narrow space by means of a wall, and thus causing a strong current where the block took place." Mr. Maclean adds: "I believe that the sea is much higher than the bed of the Fhaodhail at high water, and that, if the natural bank at Ballyphetrish [the north shore] were damaged, the sea would cover the Reef any day at high water. His Grace the Duke of Argyll, to whom the island belongs, speaks thus of the Reef in 1883: "There is indeed one large farm on the island, the famous 'Reef of Tyree,' which is chiefly—though by no means exclusively—pastured by sheep. It is a great plain containing about 1000 acres, which has once been covered by the sea

and is still very slightly raised above its level. It is absolutely unfit for tillage, being almost pure sand." Both sides of the Fhaodhail have a salt marsh vegetation of such plants as *Glaux maritima*, *Juncus Gerardi*, and *Carex extensa*; and in the channel there is to be found *Ruppia rostellata*.

That the sea communicated with the greater part of the island within comparatively recent times appears probable from the fact that such plants as *Apium nodiflorum*, var. *ocreatum*, *Œnanthe Lachenalii*, and *Samolus Valerandi* occur in some quantity over the island, and that *Ranunculus Baudotii* and *Potamogeton pectinatus* are found in one of the lochs which is now 20 feet above sea level.

Tiree being so flat, there is no shelter except at sides of ditches and on rocky ledges among the cliffs at the western end. On this account there is an entire absence of gardens, trees, and even bushes, with the exception of a few stunted roses in two localities. The vegetation is mostly dwarfed, but the soil being in great part a mixture of sand and shell lime, gives the fine pasturage for which the island has long been noted.

With regard to the interesting question of former wood on the island, the Old Statistical Account says: "It plainly appears that wood formerly grew in this parish when thinly inhabited and fewer cattle reared. Frequently large pieces of trees are found in mosses, though now there is not a tree on it." The parish also included Coll, but it is Tiree which is here spoken of. Mr. Maclean writes me in answer to queries on this subject: "There was undoubtedly a wood of considerable extent in Tiree at one time, but the remains have almost entirely disappeared as the peat moss has been exhausted. About fifty years ago roots or portions of trees —the largest measuring about three feet in diameter—were numerous where the peats were cut. The trees looked as if blown down by a gale, lying sideways about five or six feet below the surface. No trace of axe-work could be seen. I cannot say what kind of wood, but I am told it was hard, and reddish in colour. Abundance of shells of hazel-nuts could be gathered there also." There is evidence here of the former existence of fairly large timber, and it points to a

very different configuration of the land from that of the present in this part of Scotland, as a considerable amount of shelter would be necessary for such trees to attain this size. A curious remark is made in this connection by the author of the account of the island in the Old Statistical Account, —the Rev. Archibald M'Coll,—where he says that it is not probable that trees would now thrive on the island upon trial, "the situation being so far in the ocean and without shelter." As to the kind of tree which formed the wood, I think the larger ones at least were probably oak. Evidence not being forthcoming that these remains were used for torches, makes it unlikely that they were conifers, as such trees were generally put to this use in the Highlands. Mr. Maclean tried to grow willows. He says: "They grow all right in summer, but wither from the tops in spring"; and he adds: "I think the cold strong winds are the cause." A few years ago the Marquis of Lorne sent seeds of *Pinus Pinaster*, which were sown on the sandhills in one place, but the young plants were not protected from the cattle and sheep, and have since died ("A Vertebrate Fauna of Argyll and the Inner Hebrides," 1892).

Sandy shores and dunes surround the greater part of the island, muddy shores being rare. This gives a preponderance to certain plants, while some usually common species are limited in their distribution.

The geological formation of Tiree is mainly Lewisian gneiss, similar to that of its neighbour Coll, and to the Outer Hebrides, but dissimilar to that of the other parts of the Inner Hebrides, with the exception of part of Iona. The flora also would appear to correspond more with that of the Outer Hebrides than with that of the Inner, at least of those islands from Mull to Skye inclusive. Omitting the island of Coll for the present, there are certain characteristic plants common to Tiree and the Outer Hebrides which are believed to be absent from the Inner Hebrides from Mull to Skye. These are *Ranunculus Drouetii*, *R. Baudotii*, *Hippuris vulgaris*, *Apium nodiflorum*,—which occurs as the var. *ocreatum*,—*A. inundatum*, *Veronica Anagallis-aquatica*, *Potamogeton pectinatus*, *P. filiformis*, *Chara aspera*, *C. hispida*. They are all aquatic or sub-aquatic, some being sub-maritime,

and they occur in quantity. The profusion and luxuriance of the *Veronica* is one of the striking features of the flora of Tiree, while it has been found in several of the islands of the Outer Hebrides. It is to be noted that Tiree and the Outer Hebrides have low-lying ground with lochs little above sea level, and that it is characteristic of the parts of the Inner Hebrides referred to, as they are basaltic, to rise more or less precipitously from the shore to an inland plateau. There are some places where this does not occur, but not on any of those which I have examined have I met with any of these species.

Some of these plants appear to miss the intervening islands between Tiree and the Clyde area, such as *Ranunculus Baudotii* (allowing that Balfour's *R. aquatilis* from Islay is the *R. Drouetii* of Mr. Ewing's list), *Chara aspera*, *C. contraria*, and *C. hispida*. *Chara vulgaris* might be added, though it will probably be found to occur. These species are also unrecorded from the western mainland north of the Clyde area.

Among the rarer plants of Tiree there are *Ranunculus marinus*, Fr., which has not been definitely found anywhere else in Scotland; *Anthyllis Vulneraria*, var. *maritima*, Koch, not previously recorded, I think, from Scotland; *Saxifraga tridactylites*, apparently new for the West of Scotland; *Sium erectum*, not found elsewhere on the West Coast north of the Clyde; *Plantago Coronopus*, var. *maritima*, Gren. and Godr., new to Britain; *Equisetum arvense*, var. *serotinum*, Mey., new, I think, for Scotland; *Potentilla reptans*, *Carex disticha*, and *C. hirta*, which reach here their most northerly reported localities on the West Coast.

In mentioning the West Coast mainland I have not taken into account Watson's vice-county of West Sutherland, because the greater part of that district is *not* on the western watershed; and until some other division of the extreme north is made it is only misleading to consider it in that connection. Allowance must also be made for error in quoting records of plants until a much needed new edition of "Topographical Botany" appears.

Of the 320 species, excluding *Characeæ*, which have been found in Tiree, the great proportion belong here, as elsewhere,

to Watson's British type. There are 14 species which belong to the English type, viz.:

Papaver Rhœas (colonist).
Potentilla reptans.
Drosera intermedia.
Lythrum Salicaria.
Eryngium maritimum.
Apium nodiflorum.
Sium erectum.
Œnanthe Lachenalii.
Centunculus minimus.
Samolus Valerandi.
Volvulus Soldanella.
Scirpus Tabernæmontani.
Carex disticha.
Festuca rottbœllioides.

This is one twenty-third part of the whole known flora of the island: a large proportion for this coast, and more than double that of the low-ground flora of Mull.

There are 9 species which belong to the Scottish type:

Thalictrum dunense.
Ligusticum scoticum.
Pinguicula vulgaris.
Potamogeton filiformis.
Antennaria dioica.
Lobelia Dortmanna.
Pneumaria maritima.
Scirpus rufus.
Carex dioica.

To the Atlantic type belong 5 species:

Viola Curtisii.
Hypericum elodes.
Sedum anglicum.
Pinguicula lusitanica.
Scilla verna.

To the Highland type there is one species, *Selaginella selaginoides;* and to the Local type, one species, *Utricularia intermedia.*

The island is estimated to contain 18,828 acres, of which foreshores are given as 222 acres, roads 113 acres, water 489 acres, and tidal water 17 acres. The population is numbered at 2500.

The following list is the result of visits made in 1896 and 1897. A few more species will doubtless be found, especially among late-flowering plants and weeds of cultivation. Except in a few instances, I have not especially mentioned whether the species appear native or not: the nature of the localities cited will give an indication as to this.

I am greatly indebted to Mr. Arthur Bennett for notes

on many plants, and to Messrs. H. and J. Groves, who have examined all the *Characeæ*.

THALICTRUM DUNENSE, *Dum.*—Very common on sandy places bordering the shores.

RANUNCULUS TRICHOPHYLLUS, *Chaix.*—Messrs. H. & J. Groves have so named specimens from two localities near Scarinish.

RANUNCULUS DROUETII, *Godr.*—Common in streams and ditches, varying considerably in habit, length of peduncle, and size of flowers.

RANUNCULUS BAUDOTII, *Godr.*—Common about Loch Vassapol and in its exit stream.

Var. c. MARINUS, *Fr.*—Stream at Hynish Bay. This is the only authentic record for this plant in Scotland; I am indebted to Mr. Bennett for identifying the Batrachian *Ranunculi*.

RANUNCULUS FLAMMULA, *L.*—Very common in wet places.

RANUNCULUS ACRIS, *L.*—Very common as var. *Borœanus*, Jord., over all the island, except on the central moorish ground. On the sandhills it frequently has a vertical rootstock of from five to six inches in length. Another form, *R. Steveni*, Andrz., also occurs on sandhills, but not in any quantity.

RANUNCULUS REPENS, *L.*—Very common about roadsides and adjoining ditches; also at sides of cultivated fields.

RANUNCULUS BULBOSUS, *L.*—Common in sandy pastures. This species, which is also common in Coll, is very rare on the West Coast mainland north of Loch Linnhe, the only locality where I have seen it being on a sandy pasture near the shore in Ardnamurchan. It is found in the Outer Hebrides.

RANUNCULUS FICARIA, *L.*—Leaves of this plant are to be seen quite commonly, even in summer, among shady rocks. The Rev. D. Maclean sent me fresh specimens in spring with the remark "quite common in Tiree." I also found it fruiting, which is not uncommon for the species on this coast. A considerable percentage of plants have flower heads that form fruit; but frequently only a few achenes ripen on a head. When the achenes commence to swell the peduncle arches, as the head endeavours to reach the soil, thus making the fruiting inconspicuous.

CALTHA PALUSTRIS, *L.*—Very common at the sides of ditches, marshes, and lochs.

PAPAVER RHŒAS, *L.*—Very rare; only one plant seen in 1897 in a rye-grass field belonging to the Hotel; none seen the previous year.

PAPAVER DUBIUM, *L.*—Very rare; a few plants in a cornfield near Cornaig.

Fumaria confusa, *Jord.*—Rare; cultivated field, Scarinish. The last three species have no title to be considered as native.

Nasturtium officinale, *R. Br.*—Very common and luxuriant in ditches and streams.

Arabis, *sp.?*—An interesting plant, still under consideration, which Mr. Bennett thinks may be *A. ciliata*, occurs at Kenavara.

Cardamine pratensis, *L.*—Common in wet places in fields and by sides of ditches.

Cardamine hirsuta, *L.*—This usually common plant is curiously rare. Although especially looked for, only a few specimens were noticed in the ruins of Kilkenneth Chapel.

Erophila vulgaris, *DC.*—Rare; only a few plants seen in sandy ground, some distance from cultivation, between Barrapol and Kenavara.

Cochlearia officinalis, *L.*—Common on rocky and muddy shores.

Cochlearia danica, *L.*—Rather rare; it does not appear to occur in its typical form on the island. The Rev. E. S. Marshall named a plant as this species from Kenavara rocks; it is also found at Urvaig.

Sisymbrium officinale, *Scot.*—Common; usually near houses; sometimes in cultivated fields.

Brassica campestris, *L.*—Rare; cultivated fields, occasionally spreading to sandy shores.

Brassica Sinapistrum, *Boiss.*—Rather rare; a few plants on waste ground, Hynish; in some quantity in a cultivated field, Cornaig.

Bursa pastoris, *Weber.*—Common; waste places and cultivated fields.

Cakile maritima, *Scop.*—Rather rare; Hynish Bay, Traigh-na-Gillean, Salum Bay. A few plants on the sandy shore at each place.

Raphanus Raphanistrum, *L.*—Very common; occurs in most cultivated fields and in waste places in great quantity. The plant with yellow petals was alone seen.

Viola palustris, *L.*—Rare, I think; I did not see it on my second visit.

Viola Riviniana, *Reich.*—Common among the dwarf heather in some places on Scarinish Moor; uncommon elsewhere.

Viola arvensis, *Murr.*—Only seen in waste places near the Hotel.

Viola Curtisii, *Forster.*—In abundance at Ruaig in a sandy pasture which extends nearly across the island; flowers mostly yellow.

(*To be continued.*)

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S.

Since the publication, in 1883, of the second edition of Mr. H. C. Watson's "Topographical Botany," and largely under the stimulus given by that work, a great deal has been done towards widening our knowlege of the flora of Scotland. Attention was drawn to the almost total want of information from several districts, and to the imperfect nature of the records from others, even as regards common and easily determined species, with the result that the larger gaps have for the most part been filled. Doubtful records have been confirmed, and some errors in former records have been discovered and corrected. To determine whether a record should be excluded as erroneous is, however, far more difficult than to ascertain whether a new record may securely be added to our lists, since a rare species may not be again detected in its habitat, even when sought for; or it may have become extinct from some cause that is not apparent to us.

Critical groups (e.g. *Rubus*, *Rosa*, *Hieracium*, etc.) have received very close study of late years, and for such groups the former records are not in full accord with the conclusions arrived at by specialists. Most of the information gained since 1883 has been published, chiefly in numerous papers and shorter notes, some of which relate exclusively to the flora of Scotland, while in others there are only occasional references to Scottish plants, the bulk of the articles relating to other districts. The thanks of all interested in the Scottish flora are due in a very special degree to Mr. A. Bennett for the unwearied assistance he has given to local botanists in determining the critical species of their districts, and for his 'Additional Records of Scottish Plants,' in which he has brought together and put within our reach (in the "Scottish Naturalist" from 1886 to 1891, and subsequently in the "Annals of Scottish Natural History"), year by year, the information scattered through our own journal, the "Journal of Botany," the publications of Societies, and occasional floras in book form. The value of the 'Records' is most appreciated by those that know them

best; but they are scattered over a considerable time. It is time that the information within our reach should be brought together once again, and that we should see where it is still deficient. Mr. Bennett tells me that he cannot undertake to do so; but he has most kindly revised records kept by myself during a good many years. For valuable assistance, most freely given in this as well as in many other ways, I offer him my grateful thanks, in which, I feel assured, all interested in Scottish Botany will join.

The results embodied below, in so far as they are additional to those recorded in "Topographical Botany," represent the labours of love of not a few botanists, whom I shall not here attempt to enumerate. A truer conception of the value and wide extent of these labours will be best obtained from the inspection of a list of the several articles which it is proposed to add as a supplement to this paper.

The districts into which Great Britain is divided in "Topographical Botany" are based on the counties: the larger ones subdivided, as in Perth and Aberdeen, to reduce inequalities in area, and a few of the smallest combined with their neighbours. Detached and outlying portions are associated with the counties in which they lie, as may be observed under Inverness and Nairn. In some cases the divisions correspond fairly well to natural areas or river basins; but unfortunately this is the exception, and it has for a good many years been recognised by most students of our flora and fauna that the natural divisions of the country should be employed in preference to the political. But as yet our records of the larger plants have been published only on the latter scheme of distribution, and many of them would not fit in with the natural areas, and might thus be lost. It seems desirable, therefore, to adhere in this revision to Watson's areas, of which a list, with his numbers, is given below. For brevity the numbers alone are given. These have been most carefully checked, and it is hoped that no errors have been admitted through want of care. Certain species have been recorded from all the districts, and this is indicated by the word "all." Many species have been recorded from considerably more than half the areas, and for these the numbers of the areas in which they have *not* been found are preceded

by "*except*," and are printed in *italics*, as it is hoped that attention will thus be more prominently drawn to the absence of records from these, and also that the risk of confounding them with records of actual occurrence will be prevented by the difference of type. For all other species the numbers given are those of the areas from which they have been recorded, or in which they are known to Mr. Bennett or to myself, if not already published. The sign ? denotes that the number that it follows at least requires confirmation; ?? or [ ] denotes that the record is almost certainly erroneous; † after a number denotes the introduction by man, whether intentional or accidental, of the species into the area; "cas." indicates that the plant has been introduced by man in some way, directly or indirectly, but that it has failed to establish itself. A careful survey of published records leads to the belief that both † and "cas." might be used with advantage a good deal more freely than they have been by some local botanists. The names of plants that are not regarded as indigenous in the British Islands are printed in *italics*.

NAMES OF PROVINCES, AND NAMES AND NUMBERS OF VICE-COUNTIES IN SCOTLAND AS GIVEN BY H. C. WATSON IN "TOPOGRAPHICAL BOTANY," AND FOLLOWED IN THE SUBJOINED CENSUS OF DISTRIBUTION.

West Lowlands.—72, Dumfries; 73, Kirkcudbright; 74, Wigtown; 75, Ayr; 76, Renfrew; 77, Lanark.

East Lowlands.—78, Peebles; 79, Selkirk; 80, Roxburgh; 81, Berwick; 82, Haddington; 83, Edinburgh; 84, Linlithgow.

East Highlands.—85, Fife and Kinross; 86, Stirling; 87, West Perth and Clackmannan (including the Perthshire part of the Forth basin); 88, Mid Perth (Perthshire between West Perth and the rivers Tay and Garry); 89, East Perth (Perthshire east of the Tay and the Garry); 90, Forfar; 91, Kincardine; 92, South Aberdeen; 93, North Aberdeen (separated from 92 by the watersheds east and west of Inverurie); 94, Banff; 95, Elgin (including the part of Inverness that cuts into Elgin); 96, Easterness (Nairn, and rest of Inverness east of N. and S. watershed of Scotland).

West Highlands.—97, Westerness (Inverness west of the watershed, and Argyll north-west of Loch Linnhe); 98, Argyll (Argyllshire between Loch Linnhe and Crinan Canal); 99, Dumbarton; 100, Clyde Isles (islands in the Firth of Clyde); 101, Cantire (to Crinan Canal); 102, South Ebudes (Isla, Jura, and ad-

jacent islets); 103, Mid Ebudes (Mull, Coll, and adjacent islets); 104, North Ebudes (Skye, Rum, and adjacent islets).

North Highlands.—105, West Ross (Ross and Cromarty west of N. and S. watershed); 106, East Ross (Ross and Cromarty east of the watershed, with Nairn west of Moray Firth); 107, East Sutherland (with drainage to the east); 108, West Sutherland (with drainage to north and west); 109, Caithness.

North Isles.—110, Hebrides; 111, Orkney; 112, Shetland.

Ranunculaceæ.

Clematis Vitalba, L., occurs as an introduced plant in 77, 82, 83, 85, 87, 89, 99.

[1] Thalictrum alpinum, *L.*, *except 74-85, 91, 93, 95, 101, 102, 107.*

Th. minus, *L.*, *except 76, 78, 86, 95, 96, 97, 99, 105, 107, 112.*

a. maritimum, *Syme* (*dunense*, Dum.), *except 72, 73, 74, 75, 76, 78, 79, 80, 81, 84, 86, 87, 88, 89, 95, 96, 99, 100, 101, 102, 104, 112.*

b. montanum, *Wallr.*, 72, 73, 85, 88, 89, 98.

c. flexuosum (*Reichb.*), 73, 74, 77, 80, 81, 85, 87-89, 98, 102, 103, 108, (109).

Th. flavum, *L.*, 73, 74, 77, 81, 83, 85, 97, 98, 99.

Anemone nemorosa, *L.*, *except 109, 112.*

A. apennina, L., introduced in a few places.

Adonis autumnalis, L., introduced in 75, 77, 80, 83.

[2] Ranunculus circinatus, *Sibth.*, 74, 81, 83, 85-90, 105 (?).

R. fluitans, *Lam.*, 76, 77, 80, 81, 85 (?), 93, 94.

R. pseudo-fluitans (*Bab.*), *Hiern*, 99.

R. trichophyllus, *Chaix*, 72, 73, 80, 86, 88, 89, 100, 103, 106, 107, 109-112.

R. Drouettii, *Godr.*, 73, 75, 79, 83, 88-90, 102, 103, 106, 108-111.

b. Godronii (*Gren.*), 80 (?), 112 (?).

R. heterophyllus, *Web.*, 73, 85, 88, 89, 98, 111.

R. peltatus, *Schranck*, 72-74, 77, 78, 80, 83, 85, 87-93, 99, 100, 106.

c. floribundus (*Bab.*), 88, 89.

d. penicillatus (*Hiern*), 74 (?), 88, 89.

R. Baudotii, *Godr.*, 75, 76, 80-84, 103, 110-112.

b. confusus, *Godr.*, 76, 77 (?), 80 (?), 81 (?), 82-84, 89, 99, 109.

c. marinus, *Fr.*, 103.

R. Lenormandi, *F. Schultz*, 72-77, 86, 99, 100, 102.

R. hederaceus, *L.*, *except 105.*

[1] *Thalictrum.*—Under this genus I have followed the arrangement given in the eighth edition of the "London Catalogue" instead of that in the ninth edition, owing to the difficulty of correcting the published records with the latter.

[2] *Ranunculus.*—In the section *Batrachium* of this genus the records can scarcely be regarded as wholly reliable. Those for 88 and 89 (Perth, Mid and East) for species and varieties are chiefly on the authority of Dr. F. Buchanan White.

R. sceleratus, *L.*, *except 78, 79, 98, 104, 105, 107, 108, 111, 112.*
R. Flammula, *L.*, all.
R. reptans, *L.*, 85, 93.
R. petiolaris, *Marshall*, 96-98, 104, 105, 108, 110.
R. Lingua, *L.*, *except 73, 74* (?), *78, 82, 91, 94, 96-104, 107-110, 111* (?), *112.*
R. auricomus, *L.*, *except 74, 78, 84, 94, 95, 97, 98, 100-112.*
[1] R. acris, *L.*, all.
R. repens, *L.*, all.
R. bulbosus, *L.*, *except 84, 98, 101, 104, 105, 112.*
[2] R. Sardous, *Crantz* (*R. hirsutus*, Curtis), 72, 74, 77, 80, 81, 83-90, 92†, 93†, 98, 104.
[3] R. arvensis, *L.*, 73, 75, 77†, 81, 82†, 83, 85 (?), 88, 89, 109 (?), 111 (?).
R. Ficaria, *L.*, all.
b. incumbens, *F. Schultz*, 88, 89, 92.
Caltha palustris, *L.*, all.
b. Guerangerii (*Boreau*), 89.
c. minor, *Syme*, 87, 89, 90, 92, 95, 108.
C. radicans, *Forster*, 90, 105.
b. zetlandica, *Beeby*, 112.
Trollius europæus, *L.*, *except 82, 102, 110, 111.*
Helleborus viridis, L., probably nowhere native in Scotland, though recorded from 74, 75, 81, 83, 85, 91, 92.
H. fœtidus, L., as an introduced plant or casual in 75, 77, 80-83, 85, 86, 88, 92.
Eranthis hyemalis, *Salisb.*, semi-naturalised or casual, 92.
Aquilegia vulgaris, *L.*, of frequent occurrence beside rivers and in other places, apparently wild, but a very doubtful native in any part of Scotland, though recorded from 72, 73, 75, 77, 79, 83-92, 95-97, 102, 109.
Aconitum Napellus, L., introduced or as a casual in 76, 77, 81, 83, 85, 86, 88, 89, 105, 109.
Actæa spicata, L., has been recorded from 85.

Berberidaceæ.

[4] Berberis vulgaris, *L.*, *except 74, 82, 94, 96, 98, 99, 103, 104, 105, 106, 107, 108, 109, 111, 112.*

[1] *R. acris*, L.—The varieties of this species require investigation in Scotland before any record of their distribution with us can be given. Var. c. *Steveni* (Andrz.) has been recorded from 89, 97, 103, 112.

[2] *R. Sardous*, Crantz.—Though recorded with no sign of doubt of its native origin from several Scottish counties, the remark in "Topographical Botany" that it is "scarcely more than a casual plant northward of Yorkshire" probably applies in most cases. It certainly does so in 92 and 93.

[3] *R. arvensis*, L.—Not improbably introduced frequently among cornfield weeds.

[4] *Berberis vulgaris*, L.—In many, if not in most, of the counties of Scotland

Nymphæaceæ.

Nymphæa lutea, *L.* (*Nuphar luteum*, Sm.), *except 72, 78, 84, 94, 95†, 96, 97, 101, 104, 106, 107, 108, 109, 111, 112.*

b. intermedia (*Ledeb.*), 72, 86, 89, 91, 92, 97, 99.

N. pumila, *Hoffm.*, 77 (?), 86-89, 95, 96, 98, 109.

Castalia speciosa, *Salisb.* (*Nymphæa alba*, L.), *except 78, 82, 84, 94, 111.*

Papaveraceæ.[1]

Papaver somniferum, L., a casual on rubbish heaps and waste ground.

P. Rhœas, *L.*, 75-77, 80-94, 103, 105, 109, 111, 112.

P. dubium, *L.*, *except 97, 98, 104.*

b. Lecoqii (*Lamotte*), 85 (?), 89, 105, 106.

P. Argemone, *L.*, 72, 75, 77, 80-92, 94-96, 101, 102, 105, 106, 110.

Meconopsis cambrica, Vig., 72, 75, 83, 85-87, 90-92, 95.

Glaucium flavum, *Crantz*, 72-76, 80 (?), 81, 82, 84, 85, 91 (long ago extinct), 95 (?), 98, 99.

Chelidonium majus, *L.*, 72-93, 95, 96.

Fumariaceæ.

Neckera lutea, *Scop.* (*Corydalis lutea*, DC.), 88†, 92†.

N. claviculata, *N. E. Br.* (*C. claviculata*, DC.), *except 77, 78, 79, 82, 90* (?), *102, 103, 109, 110, 111, 112.*

Fumaria pallidiflora, *Jord.*, 79†, 80, 89.

F. Boræi, *Jord.*, 73, 74, 76, 77, 82, 85-89, 91, 92, 100, 101, 105, 111.

F. confusa, *Jord.*, 72, 74, 85, 87, 89, 100-102, 103†, 110.

F. muralis, *Sonder.*, 86.

F. densiflora, *DC.*, 72, 74, 80, 82-85, 88-93, 95, 96, 111, 112 (?).

F. officinalis, *L.*, *except 98, 104.*

F. Vaillantii, *Loisel*, 83 (?), 112 (?) (probably erroneous records).

F. parviflora, *Lam.*, 80†, 82, 83, 87, 89 (?), 95 (?), 96 (?), 109 (?), 112 (?) (those queried are probably erroneous).

Cruciferæ.

Cheiranthus Cheiri, L., well established, but not with a claim to be considered native, 88, 89, 91.

the Barberry, though often not rare, is an evident introduction, or has probably grown from seed of introduced plants. This is certainly the case in the north-east of Scotland.

[1] Papaveraceæ.—In this order *Glaucium flavum* is probably the only species that does not owe its presence in Scotland (on the coast) to human agency. All the species of *Papaver* are weeds of cultivation. *P. somniferum* is a mere casual anywhere. *P. Rhœas* is scarcely more than a casual in 91 to 94 at least, and probably in the higher numbers. *P. Argemone*, though a common weed near Montrose, is a mere casual in 92, and probably in other districts from which it is recorded. *Meconopsis cambrica* and *Chelidonium majus*, though well established in a good many places, always, in my experience, occupy situations near gardens, along roads, or otherwise such as to indicate their introduction by man as more than probable.

Nasturtium officinale, *R. Br.*, all.
N. sylvestre, *R. Br.*, 72, 73, 81, 83, 85†, 86†, 87-89, 98.
N. palustre, *DC.*, 72-78, 80-90, 98 (?), 99, 100.
N. amphibium, *R. Br.*, very doubtful as a Scotch plant, though recorded from 72, 75, 77, 83, 85, 87, 94.
Barbarea vulgaris, *R. Br.*, *except 97, 101, 102, 103, 106, 107, 110, 112.*
B. stricta, *Andrz.*, 86†.
Arabis alpina, *L.*, 104 (Skye).
A. petræa, *Lam.*, 88, 91, 92, 94, 96 (?), 97, 98, 103-105, 106 (?), 107, 108, 110, 112.
b. hispida, *DC.*, 92, 106.
A. ciliata, *R. Br.*, 90 (??).
A. hirsuta, *Scop.*, *except 93, 96, 99, 101, 105, 111, 112.*
A. Turrita, L., 88.
A. perfoliata, *Lam.*, 77, 80, 87-89, 90 (?), 99, probably an introduction wherever it occurs in Scotland.
Cardamine amara, *L.*, *except 74, 78, 82, 97, 101-112.*
b. lilacina, *F. B. White*, 88.
C. pratensis, *L.*, all.
C. hirsuta, *L.*, all.
C. flexuosa, *With.*, *except 73, 82, 93, 107, 112.*
C. impatiens, *L.*, 75 (?), 77 (?), 83 (?), 97 (?), 111 (?). All records of this plant for Scotland require confirmation.
C. bulbifera, *Syme*, 75.
Draba muralis, L., recorded from 77, 83, 88, 90, 100, but probably erroneously, also 86†, 98†.
D. incana, *L.*, 87-90, 92, 94, 96-98, 102-112.
D. rupestris, *R. Br.*, 88, 89, 90 (??), 94 (??), 96, 98.
Erophila vulgaris, *DC.*, *except 101, 104, 107, 112.*
E. præcox, *DC.*, 85
E. inflata, *Hook. f.*, 88, 89.
Cochlearia officinalis, *L.*, *except 79†, 80†, 88, 89.*
C. alpina, *H. C. Wats.*, 78, 80, 87-90, 92-94, 96-98, 104, 105, 108-110, 111 (?), 112.
C. micacea, *Marshall*, 88, 98, 112.
C. danica, *L.*, 73, 76, 81 (?), 83, 85, 87, 91-93, 95, 99, 100, 102, 103, 106, 108, 110, 111 (?), 112.
C. grœnlandica, *L.*, 88, 105, 106, 108-110, 112.
C. anglica, *L.*, 73, 74, 78 (?), 95.
C. Armoracia, *L.*, a casual in waste places.
Hesperis matronalis, L., a casual not uncommonly met with.
Sisymbrium Thalianum, *J. Gay*, *except 101, 102, 103, 105, 107, 108, 110, 112.*
S. officinale, *Scop.*, *except 112.*
b. leiocarpum, *DC.*, 87, 88.

S. Sophia, *L.*, 77 (?), 80†, 81-85, 86†, 88†, 90, 91, 95, 106, 109†.
S. pannonicum, *Jacq.*, 87†, 92†.
[1] S. Alliaria, *Scop., except 97, 101, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112.*
Erysimum cheiranthoides, L., a casual, recorded from 80, 81, 84, 85, 91, 95, 103.
Camelina sativa, Crantz, casual, 87, 88, 92.
Subularia aquatica, *L.*, 71-73, 85 (?), 87-94, 96-99, 103, 105, 108-110, 112.
Brassica oleracea, L., *B. Napus*, L., *B. Rutabaga*, DC., *B. Rapa*, L., are all met with by waysides and on waste ground, as casuals.
B. monensis, *Huds.*, 72-76, 82 (?).
B. Sinapioides, Roth (*B. nigra*, Koch), a casual in 72, 77, 81, 83, 85, 95.
B. Sinapistrum, *Boiss.*, all, as a weed of cultivated ground.
[2] B. alba, *Boiss.*, 73, 74, 77-85, 87†, 88†, 89†, 91†, 92†, 101, 102, 104, 105, 106†, 110, 112†.

(*To be continued.*)

ZOOLOGICAL NOTES.

Harvest Mouse in Moray.—Perhaps I may be allowed a few words in reference to Mr. W. Taylor's note on the Harvest Mouse (*Mus minutus*) which appeared in the October number of the "Annals." I am the more anxious to do so because, in Messrs. Brown and Buckley's "Fauna of Moray," vol. i. p. 202, a mistake has been made in so far as it is said the specimen of the Harvest Mouse found at Greenscares, and now in Banff Museum, had been "sent to Mr. George Sim of Aberdeen, who identified it." This is not so. I merely saw the specimen in spirit in the Banff Museum, and took a note of the specimen as labelled. As to the species I had no doubt, for I have had specimens sent to me several times from England. Mr. Taylor remarks: "I do not yet believe that *Mus minutus* has ever been found north of the Grampians." This may prove to be the correct finding, yet against it I have to note that the late Mr. Stewart Burnett, than whom there was no more close and accurate observer, found a Harvest Mouse at Kemnay House in 1889; MacGillivray, in his "History of British Quadrupeds," p. 257, mentions having had one sent to him from Aberdeen-

[1] *S. Alliaria*, Scop., occurs in the counties near Aberdeen only in situations that suggest its introduction.

[2] *B. alba*, Boiss.—In most districts, if not throughout Scotland, this species is met with only as a cultivated plant, or as a weed of cultivation, or a casual. Certainly several of the above records ought to be marked with †.

shire; and lastly, Mr. J. E. Harting records in the "Zoologist" that Mr. Small of Edinburgh received two specimens from Banffshire. I have no wish to dogmatise in this matter, but it seems necessary to suspend an absolute refusal to admit the species as having been found in the district until such time as the authorities above mentioned are proved to have been mistaken.—Geo. Sim, Aberdeen.

Harvest Mouse in Moray.—Mr. W. Taylor's note in the "Annals" for October last reminds me that in Mr. Harting's article on the 'Harvest Mouse,' published in the "Zoologist" for November 1895, "Banffshire," on line 21 of page 419, should read "Berwickshire," as in my book on the "Mammals of the Edinburgh District," from which Mr. Harting was quoting. This disposes of the second "Banffshire" record cited in Harvie-Brown and Buckley's "Fauna of the Moray Basin" (vol. ii. p. 287, footnote).—William Evans, Edinburgh.

The Common Dolphin and the Bottle-nosed Dolphin in the Moray Firth.—On the 14th October last four Bottle-nosed Dolphins (*Tursiops tursio*) were stranded and shot near Delny, Ross-shire. The largest female measured as follows:—Total length, 9 feet; breadth of tail, 2 feet; height of dorsal fin, 11½ inches; length of flipper, 15 inches; breadth of flipper, 6 inches. The skin was lead coloured mottled with white on the dorsal surface, and all white on the ventral surface.

The skull measured:—Basal length, 19½ inches; breadth behind orbit, 10 inches; vertical height, 7 inches; length of rostrum, 11½ inches. Teeth, $\frac{23}{23}$ and $\frac{23}{24}$. The largest teeth were a quarter of an inch in diameter. The younger animals had fewer teeth.

The Common Dolphin (*Delphinus delphis*) has been caught in the Moray Firth two or three times within the past few years. Provost Jenkins, Burghead, had a specimen in his yard last year caught at Burghead. I have examined two skulls of this species, one of which was found on the Elginshire coast. Both the above-mentioned species are presumably new to this district, as no mention is made of them in Messrs. Harvie-Brown and Buckley's "Vertebrate Fauna of the Moray Basin."—Wm. Taylor, Lhanbryde.

Notes on the Birds of Carmichael, etc.—During the fine weather prevailing at the end of October and the beginning of November this district was visited by several birds, which, as a rule, are not conspicuous here while on their autumn migrations. Redwings (*Turdus iliacus*), in wild and restless bands, came daily—usually disappearing by mid-day—from the 25th October till the second week of November, after which date only a few stragglers have been observed. At the same time Larks (*Alauda arvensis*), Goldcrests (*Regulus cristatus*), Creepers (*Certhia familiaris*), Wrens

(*Troglodytes parvulus*), and Redbreasts (*Erithacus rubecula*) were very abundant. During the passage of these species several Hawks (*Accipiter nisus* and *Falco æsalon*) were much in evidence.

A Snow Bunting (*Plectrophenax nivalis*) in tawny plumage was caught on Tinto in a rabbit-trap on 16th September. By the end of that month the Swallows were gone, but on the 21st October I saw three Swallows (*Hirundo rustica*) peacefully circling in the frosty sunshine around Lochlyock farmhouse at the north base of Tinto (which was covered with snow on the 14th and 15th, when the temperature was as low as eighteen degrees Fahr.) On the same day I observed a pair of Marsh Tits (*P. palustris*) at Muirglen, near Lanark. On the 2nd November the Kingfisher (*Alcedo ispida*) appeared in its old haunts at the foot of the Manse garden; on the 3rd a few Bramblings (*Fringilla montifringilla*) were seen; and on the 17th a Peregrine (*Falco peregrinus*) was observed passing low down over Carmichael Hill. Among the Teal, Mallard, and Wigeon, which are very abundant on the Clyde at present, I observed on the 6th December a pair of Golden-eye Duck (*Clangula glaucion*, L.) One of them was tame enough to allow my watching it for some time diving in pursuit of food. The birds are in immature plumage. On 14th December, during a heavy sleet shower, I saw a Great Gray Shrike (*Lanius excubitor*, L.) in hedgerow at Harleyholm stackyard. —J. D. W. Gibson, Carmichael.

Jay in East Lothian.—On 27th September last I examined, in the house of Mr. John Fairbairn, Stobshiel, East Lothian, a specimen of the Jay which he had caught in a rabbit-trap in a plantation adjoining the shepherd's house at Wanside on the Lammermuirs. The exact date was not forthcoming, but was, as far as its captor (my informant) could recollect, in 1882. Though such a comparatively old record, I consider it to be of interest in consideration of the extremely local distribution of this bird in the Lothians at the present time.—Robert Godfrey, Edinburgh.

The Jay in Berwickshire.—It is interesting to record that a Jay (*Garrulus glandarius*) was shot on 23rd October last, on the confines of this parish, Chirnside, and that of Ayton, and is being preserved. The last specimen seen in Berwickshire, as far as I can make out, was shot at Rawburn near Longformacus about fifty years ago, and was to be seen in a shepherd's house in that region not many years ago. About that time there were Jays on Leader side in the Lauder district. I have been resident in the Eastern Borders for nearly fifty years, and have never seen one in Berwickshire; although I have often seen the bird in northern counties. Two more specimens are still left, Lord Tweedmouth's keeper informs me, at Blackburn, in Chirnside Parish, but I am afraid they will get "short shrift" if a gunner gets within shot. These birds must have emigrated to the district, for it is almost impossible that in a game-

preserving district they would have been allowed to live.—C. Stuart, Chirnside.

The Jay in Dumfriesshire.—At one time this fine bird may have been a regular inhabitant of this district, since it was some half century ago, as I believe, pretty common in Ayrshire. Nowadays it is only a casual visitant. One frequented a Stewartry plantation within a few miles of Maxwelltown for some weeks in October 1894. On the 5th November a Jay (*Garrulus glandarius*) was shot in the neighbourhood of Lockerbie. I hear from Mr. Gilbertson, keeper on Closeburn, that a drove of Jays is frequenting the woods there. No doubt these are all birds on migration. The species sometimes migrates from the far east of Europe in untold multitudes.—R. Service, Maxwelltown.

Rose-coloured Pastor in West Ross-shire.—On 16th August last, Murdo Mackenzie shot a bird which had been observed in Inverbroom garden for two or three days previously. It proved to be a specimen of the Rose-coloured Pastor (*Pastor roseus*), the plumage agreeing exactly with the illustration of this species in Gould's "British Birds." The bird has been sent to Mr. Inglis of Dingwall to be mounted for the Braemar Museum.—J. A. Fowler, Inverbroom.

Partial Albinism in the Robin at Dalmeny.—About the 1st of November a rather uncommon variety of the Robin made its appearance in the garden here. It was nearly white, with the exception of a few brown feathers on the head and back. The breast was red, spotted with white, while the under parts of the body and the tail were pure white. Where it had come from was a matter of some conjecture, as a bird of so conspicuous plumage could not remain long anywhere without being noticed. After a few days I caught it, and it is now in my possession. It is a most interesting pet, and when whistling has a low, sweet note that is very pleasing.—Chas. Campbell, Dalmeny Park.

The Pied Flycatcher, etc., in Mid-Nithsdale.—In reference to Mr. Service's note on the Pied Flycatcher (*Muscicapa atricapilla*) in the October "Annals," I may say that it still frequents this district, and may now be regarded as a rare but regular summer visitor to Mid-Nithsdale. Its favourite haunts are the small streams tributary to the Nith. On the 20th May of this year I found a pair nesting about two miles below the spot where it was first discovered in 1884. The Wood Warbler (*Phylloscopus sibilatrix*) far outnumbers the Willow Wren (*Phylloscopus trochilus*), which is the commoner of the two elsewhere in Mid-Nithsdale. As for the Chiff-Chaff (*Phylloscopus rufus*), it is of extreme rarity hereabouts, if it occurs at all. I have never heard its note myself.—Robert Armstrong, Thornhill.

Waxwings in Banffshire.—A male and female Waxwing (*Ampelis garrulus*) were shot at Tomintoul on the 13th of November last, and sent to Messrs. Snowie and Son for preservation.—"Inverness Courier," 16th November 1897.

Waxwing in Elginshire.—An adult female was shot on Findhorn Links on the 4th of November last.—James Brown, Forres.

Waxwing in the Cairngorm District.—A male and female were received by me for preservation on the 24th of November last which had been shot in the Cairngorm district.—R. Small, Edinburgh.

Long-eared Owl in the Outer Hebrides.—As the Long-eared Owl (*Otus vulgaris*) is not included in Messrs. Harvie-Brown and Buckley's "Vertebrate Fauna of the Outer Hebrides" as occurring there, it may be worth recording that Colonel W. C. Verner in January 1897, near Loch Maddy, North Uist, shot a specimen, which I have examined. My friend Colonel Verner further informs me that the keeper, who well knew the difference between the Long- and Short-eared Owls, declared that *both* species nested there. There not being any trees on the island, I should not have mentioned this, to me, most improbable assertion as regards the arboreal Long-eared Owl, but for the fact that Mr. W. Ogilvie-Grant and Capt. Savile Reid inform me that on the 10th May 1897 they found a nest of the Long-eared Owl on the ground on the large island in Syre Loch, Sutherland. One live and one dead young birds were in the nest: the dead one was half eaten. The ground at the time was covered with snow. One of the old owls was shot, and is to be seen in the Natural History Museum, South Kensington. Messrs. Ogilvie-Grant and Reid at the time were trying to find a nest of the Short-eared Owl (*Otus brachyotus*), which species had been stated to breed on the above-mentioned island; but they did not see any there or in the adjacent district, although they found a nest of the Tawny Owl (*Syrnium aluco*) on the mainland. I hope some Scottish ornithologist may next spring be able to either confirm or disprove the statement that the Long-eared Owl breeds in North Uist. I am myself very doubtful.—L. Howard Irby, London.

Dark form of the Barn Owl in Kincardineshire.—A female of this form of *Strix flammea* was killed at Portlethen on 23rd November last, and was sent to me for preservation. The chief difference in this variety—which appears to be the dominant form in Denmark—is, that its breast and lower parts are reddish orange instead of the pure white of the typical bird. This is the second instance of the occurrence of this race known to have occurred in the "Dee" area, the first being one killed near New Deer in 1886. —Geo. Sim, Aberdeen.

The Lesser Kestrel in Aberdeenshire.—A female of the very rare *Falco cenchris* was shot by the Rev. Elton Lee on the estate of Boynalie on the 25th of October last, and was sent to me for preservation. This appears to be the third record of the species for Britain, one having been obtained in Yorkshire, and another near Dover. Thus the one now noted is the first instance of its occurrence in Scotland. The weight of the bird was barely $4\frac{1}{4}$ ounces, expanse of wings $25\frac{1}{2}$ inches, length from beak to tail $11\frac{1}{2}$ inches. Claws white. In the stomach were beetles, grubs, and eggs of insects.—Geo. Sim, Aberdeen.

The Scaup in Inland Waters.—Last winter I noted in these columns that the Scaup (*Fuligula marila*), usually described as a marine species, seldom frequenting inland waters, was a regular winter visitor to the lake sanctuary at Monreith. Afterwards, early in April, I visited the lake, and saw seven or eight Scaup still there, nearly all the other winter ducks having departed. I did not see the lake again until the first week in August, when, to my surprise, I found a fleet of nine or ten scaup. The summer plumage of ducks is very deceptive, so that I could not be sure how many of these were young birds of this season, nor do I know whether they were bred on the shores of the loch, but the strong probability is that the parents had never left it. I examined them to-day (19th September) very carefully through a glass, and saw that one adult drake was well on with his winter plumage. There were four Pochards with them in August, apparently adult birds, and these are still there to-day, and two or three Tufted Ducks (*Fuligula cristata*). I do not think the male Pochard (*Fuligula ferina*) undergoes such a complete summer change as the drakes of most species. The heads of these in August were quite red and comely, though the Mallards are still, at this date, in a very unsightly condition.

The Great Crested Grebes (*Podicipes cristatus*) bred again this year, the second in succession, on this loch, but they have moved to a moorland loch in the northern part of the parish. This morning (20th September) the first winter flight of Tufted Duck have arrived —about twenty.

Since writing the above, an interesting fact has come to light. A lady who lives in my neighbourhood told me she was in great distress because some of her young Pochards had come to grief by swallowing fragments of glass which had fallen into her lake during a glass-ball shooting competition. "Young Pochards!" quoth I, "where do you get them?" She then told me that the gamekeeper on an adjoining property had given her a brood of young Pochards, and also one "of those little black and white diving ducks," *i.e.* Tufted Duck. You may be sure I was interested; and, on making further inquiry, I found that both Pochards and Tufted Duck had bred for the last five or six years at least in a group of seven moorland lochs in Wigtownshire. This

accounts for the presence of odd pairs of both species throughout the summer in our sanctuary, which has often puzzled me. I have very little doubt that the Scaup also bred in these lakes, which abound in islets.—Herbert Maxwell.

Long-tailed Duck in Kirkcudbrightshire.—On the 5th of November I had the pleasure of handling a fine old drake of the Long-tailed Duck (*Harelda glacialis*) in the finest feather. It had been shot the same morning near Kingholm on the Nith. Of late years this duck has shown a tendency to put in a more frequent appearance on the Solway Firth. But here, as elsewhere, it is extremely unusual to find one on inland waters. This specimen was found some four or five miles from the sea. Its abundance off the rest of the West Coast contrasts very strongly with its rarity here.—Robert Service, Maxwelltown.

Long-tailed Duck in Dumfriesshire.—A small but adult female of *Harelda glacialis* was sent to me as an unknown bird from Priestside, near Annan, on 14th December 1897. The specimen in question is chiefly remarkable for having a *pure white neck*, more resembling that of a male *Harelda* than the neck of an average female.—H. A. Macpherson, Allonby Vicarage, Cumberland.

Hybrid Capercaillie and Black Cock near Inverness.—I was shown to-day, 14th November 1897, a fine specimen of a hybrid between a Capercaillie and a Blackcock. The bird was a male in beautiful plumage, which partook more of the Blackcock than the Capercaillie, having the blue gloss of the neck of the former species. The tail, which was expanded, was only in the very least degree rounded. The bird was killed last month, not far from Inverness, but the exact locality was not forthcoming, though probably it was in the wooded range that runs parallel with, but at some distance from, the coast, and nearer Forres than Inverness.—T. E. Buckley, Inverness.

Water Rail breeding near Glasgow.—On 26th June last Mr. M'Lachlan of Glasgow found a nest of the Water Rail (*Rallus aquaticus*) containing ten eggs, flushing the bird off the nest. A pair of adults were shot there in August, and were probably the birds resident there.—Charles Kirk, Glasgow.

Sabine's Gull in Arran.—On the 24th of September 1897 I received in the flesh an immature Sabine's Gull (*Xema sabinii*, J. Sabine) which had been sent to me by my obliging correspondent Dr. Niel Fullarton, Lamlash. According to information subsequently communicated to me by the gentleman named, the bird must have been in an exhausted state, as it allowed itself to be captured by a little boy, the son of Mr. Peter Henderson, Sliddery, Arran. It was got on the shore at Sliddery, and died in Mr. Henderson's house on the day following its capture. Dr. Fullarton, referring to the Note in the "Annals" for January 1897 on Sabine's

Gull in "Clyde," says (*in lit.* 19th October 1897): "I have frequently seen what I took to be the same little gulls before, but never got hold of one until the 22nd ult." The present is, however, the first record, with proof, of its occurrence in "Clyde." Dr. Fullarton has had great pleasure in concurring in my proposal to present the bird to the Edinburgh Museum of Science and Art.—JOHN PATERSON, Glasgow.

Great Northern Diver at St. Abb's Head.—A female Great Northern Diver (*Colymbus glacialis*) in full summer plumage was captured in the salmon-nets at St. Abb's Head on the 22nd of May last, and was found on dissection to contain well-developed eggs.—CHARLES KIRK, Glasgow.

Leach's Petrel and Little Auk in Moray.—On the day following the heavy north-east gale of the 28th of November last, a Leach's Petrel (*Cymochorea leucorrhoa*) was found dead on Cluny Hill, Forres, and a Little Auk (*Mergulus alle*) was picked up alive on Findhorn shore.—JAMES BROWN, Forres.

Germon in the Solway Firth.—A specimen of the Germon or Long-finned Tunny (*Orcanus germo*) was caught alive on the sand near Silloth on the 25th of October 1897. I was away from home, and therefore the captor of the fish eventually buried it. On my return I dug it up and compared it with the plates in Couch and Day's "British Fishes." It measured 38 inches in length from the tip of the nose to the centre of the tail, and 27½ inches in girth. The pectoral fin measures 16 inches.—H. A. MACPHERSON, Silloth.

Scad in the Solway Firth.—A specimen of the Scad, or Horse Mackerel (*Caranx trachurus*) was found stranded on the sand near Silloth on 11th December, and was sent to me for identification as a strange fish. Although this species is often very numerous in British waters, I believe that it is a scarce visitor to the Solway Firth. Neither I, nor the fisherman who sent me the present specimen, had met with local specimens previously.—H. A. MACPHERSON, Allonby Vicarage, Cumberland.

Scabbard Fish in Scottish Waters.—A female *Lepidopus caudatus*, 2 feet 2 inches long, was caught by line off Barra Head and brought into Aberdeen market on 19th November last. Through the kindness of Mr. William Meff, fish-salesman, it is now in my possession. Up to the date of publication of Day's "History of British and Irish Fishes" there was no record of this fish for Scotland, only eleven for England, and one for Ireland. Couch says in his "British Fishes" "that the ventral fins are represented only by a pair of movable scales; whilst the third takes the position of the anus." Day remarks: "Ventrals in the form of a pair of scales situated below the middle of the pectoral. . . . Anus situated

at about the centre of the length of the body, and having a small movable scale a little distance behind it." Now in the specimen under notice there is not the slightest indication of such ventral scales, and what is considered a scale by the authors named takes the form of a strong, bayonet-shaped spine situated behind the vent, and is an inch long. Yarrell describes one he saw in 1808, and remarks "that it had a triangular scale situated behind the vent." But I cannot see that the name *scale* can be applied to such an organ: one might as well call the spines on the back of the Dog-fish scales. Yarrell says of his specimen: "I observed within the skin, on the abdominal parts, a great many *Ascarides*, pointed at each end, and of a whitish colour." The fish now recorded had a number of such parasites.—Geo. Sim, Aberdeen.

Pygœra (Phalera) bucephala (*L.*) in Moray.—The larvæ of this moth, when feeding on the oak, usually choose a twig far up the tree, and it is not often that an opportunity of seeing them in the act is afforded to the observer. There is an oak in the wood near Elgin which, through some injury in its youth, has grown laterally in place of vertically. Thus the summit of the tree is only a few feet above the ground, although it is a considerable distance from the root. In August I found a colony of buff-tip larvæ established in what they no doubt considered one of the topmost branches, around the twigs of which they had entwined themselves in a cluster. I took a few home. They fed readily on oak leaves, buried themselves in earth early in September, and emerged as moths on 5th June following. The moths did not return to the tree this year.—Henry H. Brown, Elgin.

Euchelia (Hipocrita) Jacobææ (*L.*) and its Food-plant.—A number of larvæ of the Cinnabar Moth were early in September sent me from the neighbourhood of Elie. Along with them was sent a portion of the plant upon which they had been feeding, and which appeared to be *Senecio tenuifolius*, or a kindred species. I could not conveniently get any species except the common ragwort (*S. Jacobæa*), and supplied them with an abundance of fresh shoots of that plant which might have satisfied the most fastidious caterpillar. They would not taste it, and in spite of my efforts died one after another. I cannot say whether this was a case of acquired taste on the part of the larvæ, or whether their behaviour was customary amongst the species, as I have had no opportunity here of studying the habits of the Cinnabar Moth.—Henry H. Brown, Elgin.

Alucita hexadactyla (polydactyla) in Scotland.—In looking over the back numbers of the "Annals" I was much astonished to notice (vol. vi. p. 48) a quotation made by Mr. Elliot to the effect that Mr. C. G. Barrett "could not find a record of *A. polydactyla* occurring in Scotland at all." In August 1893 I took the species in Argyleshire, and in "The Monograph of the British Pterophorina" (in which most of

the recorded localities for the British "Plume" Moths are summarised), p. 161, I write: "Common from September to June at Pitcaple," and that the recorded localities "suggest a wide distribution in Scotland." This seems to have been overlooked by Mr. Barrett and Mr. Elliot.—J. W. Tutt, Westcombe Hill, S.E.

Migratory Locust in Aberdeenshire.—A fine specimen of this Locust (*Pachytylus migratorius*) was sent to me alive by Miss M. A. Smith, Coldwells School, Longhaven, on the east coast of Aberdeenshire, for preservation. It was caught in a cornfield near the sea in that district on Saturday 2nd October, and kept in a glass cell until the 6th. Professor Trail, to whom I showed it, thinks it must have been blown across from the continent.—John Davidson, Marischal College, Aberdeen.

Boreus hiemalis, *L.*, **in Midlothian.**—In the part of this journal for January 1897 I mentioned a number of localities in the neighbourhood of Edinburgh in which I had met with this insect during October and November of the previous year. I have now to add two fresh localities for it, namely: banks of the Water of Leith below Harper-rig Reservoir, in the western section of the county, and Mountlothian, between Penicuik and the Moorfoot Hills, in the southern section, one specimen in each, on 10th and 22nd November 1897 respectively.—William Evans, Edinburgh.

Meta menardi (*Latr.*) **in Kirkcudbrightshire.**—Referring to my note in the "Annals" for October 1896, I have received from Mr. R. Service, Dumfries, an adult female of this spider captured on 12th December 1897 in a cave in Conhuith Wood, Kirkcudbrightshire, where he found the cocoon on a former occasion.—William Evans, Edinburgh.

Diaptomus hirsus, *G. S. Brady*, **in Loch Lochy, Inverness-shire.**—This is so far a somewhat rare freshwater Copepod, at least its distribution appears to be restricted and local. It was moderately common in a gathering of Entomostraca I collected a few years ago in Loch Harray, Orkney, and I have also obtained what appears to be the same species in a loch near Campbeltown (Cantyre). These are, I think, all the localities where it has been observed hitherto, so that Loch Lochy is a distinctly new station. *Diaptomus hirsus* is readily distinguished from *D. gracilis*—the most common species of the genus in the lochs of the mainland of Scotland—by its stouter "build," by its shorter antennules, and by the structure of the fifth pair of thoracic feet in male and female.—Thomas Scott, Leith.

On the occurrence of Dulichia monocantha, *G. O. Sars*, **in the Clyde.**—I have recently obtained an undoubted example of this Amphipod among some material collected in the Clyde by Mr. F. G. Pearcy. I have on two or three previous occasions obtained specimens of what appeared to be this species, but they were females,

and it is very difficult distinguishing the species of this group from the females alone. The specimen last obtained was, however, a male, and was easily distinguished by the strongly marked character of having the first pair of coxal plates "produced to long horn-like processes pointing forwards." This Amphipod is now for the first time added to the British fauna.—THOMAS SCOTT, Leith.

On the occurrence of Paramunna bilobata, *G. O. Sars*, in Loch Fyne.—While examining recently a gathering of dredged material from near Otter Spit, Loch Fyne, collected by Mr. F. G. Pearcy in October last, I obtained two or three specimens of the minute Isopod *Paramunna bilobata*. Though small, this is a well-marked species; the bilobed form of the front of the head and the strongly toothed lateral margins of the caudal segment distinguish it at a glance; Professor Sars, in a recently issued part of his second volume on the "Crustacea of Norway" (which is at present in course of publication), says: "Out of Norway this species has not been recorded"; it seems therefore to be an addition to the British fauna.—THOMAS SCOTT, Leith.

BOTANICAL NOTES AND NEWS.

Viola tricolor (*L.*) and its Allies.—A very important contribution to the study of the section *Melanium* of the genus *Viola* has been recently made by Dr. Veit Wittrock under the title of 'Viola-Studier: Morfologisk-biologiska och systematiska studier öfver Viola tricolor (L.) och hennes närmare anförvandter' ("Acta Horti Bergiani," 1897, ii. pp. 3-142, with 14 partly coloured plates and 17 figures in text). In this paper the author distinguishes, gives names to, describes, and figures the following "sub-species" of *V. tricolor* (L.) and *V. arvensis*, Murray, each with subordinate forms:—

Viola tricolor (L.), ex parte.,—*genuina*, *ammotropha*, *coniophila*, and *stenochila*. *V. arvensis*, Murray,—*communis*, *sublilacina*, *patens*, *curtisepala*, and *striolata*. Of these "sub-species" some ought to be detected in Scotland, or in England. It is probable that some of the names must yield to earlier names given by Jordan and other southern botanists. Those to whom the original is not readily accessible or intelligible will feel grateful for a review in the "Journal of Botany" (November 1897, pp. 454-458), in which the new "sub-species" are briefly described. Unfortunately, it is not easy to determine in how far these are distinct from the forms already described and named by Jordan and other specialists.

Among other members of the section *Melanium* described in this important paper are *V. alpestris* (DC.), an alpine or sub-alpine

plant intermediate between *V. tricolor* and *V. arvensis* (with subspecies *zermattensis*, *vallombrosana*, and *subarvensis*), and *V. lutea*, Huds., var. *grandiflora* (L. Vill.).

Scottish Euphrasiæ.—Mr. F. Townsend in his monograph ("Journ. Bot.," October) gives descriptions of the "species" and varieties known to him from the British Islands, with their distribution. The records for Scotland are as follows (the Watsonian *numbers* are added to the *names* of the districts, which alone are given in the "Journal"):—

Euphrasia borealis, Wettst.—92, Aberdeen; 96, E. Ness; 98, Argyll; 108, W. Sutherland; 109, Caithness; 112, Shetland.

E. brevipila, Burnat and Gremli.—87, West Perth; 88, Mid Perth; 92, S. Aberdeen; 98, Argyll; 105, W. Ross; 108, W. Sutherland; 109, Caithness.

E. nemorosa, H. de Mart.—92, S. Aberdeen; 112, Shetland.

E. curta, Fries.—"Perth, Tumbling Bay (J. Britten, comm.)"; 92, S. Aberdeen; 97, W. Ness; 108, W. Sutherland; 109 (?), Caithness, a peculiar form.

E. occidentalis, Wettst.—97, W. Ness; 108, W. Sutherland.

E. latifolia, Pursh.—108, W. Sutherland, discovered in three localities on north coast, in July 1897, by Rev. E. S. Marshall. In one of the localities—Bettyhill—it occurs under the form *grandiflora*, Wettst.

E. foulaensis, Towns.—112, Shetland. Specimens gathered by Rev. E. S. Marshall in W. Sutherland and Caithness have been referred by Professor Wettstein to *foulaensis*.

E. gracilis, Fries.—88, Mid Perth; 92, S. Aberdeen; 96, E. Ness; 97, W. Ness; 98, Argyll; 105, W. Ross; 108, W. Sutherland; 109, Caithness; 112, Shetland.

Var. *Friesii*, Sanio.—92, S. Aberdeen, in Braemar.

Var. *primaria*, Fries.—105, W. Ross, at Kinlochewe.

E. scottica, Wettst. (= *E. paludosa*, Towns., *non* R. Br.).—92, S. Aberdeen; 96, E. Ness; 97, W. Ness; 105, W. Ross; 108, W. Sutherland; 112, Shetland.

E. Rostkoviana, Hayne.—98, Argyll; Ross (Howle Hill, Walford, 1891, A. Ley); 109, Caithness.

"Hybrids" found in Scotland are *E. Rostkoviana* × *brevipila* (*E. notata*, Towns.), *E. gracilis* × *brevipila* (*E. difformis*, Towns.), *E. occidentalis* × *brevipila* (*E. pratiuscula*, Towns.), *E. brevipila* × *scotica* (*E. venusta*, Towns.), *E. scotica* × *gracilis* (*E. electa*, Towns.)

Under "Addenda," on p. 475, is mentioned *E. curta*, var. *glabrescens*, Wettst., n. var., from shell sand at Tain in E. Ross.

The Set of British Hieracia issued by the Messrs. Linton has reached its third fascicle. It contains examples of numerous forms not yet detected beyond the British Isles, and it records the localities, many of them in Scotland, in which each has been found.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1897.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

In Memoriam,—David Robertson, LL.D., with bibliography of writings. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 18-42.

Vertebrate and Plant Life on Ben Nevis. By Colonel H. W. Fielden. *Trans. Norfolk and Norwich Nat. Soc.*, vol. vi. pp. 245-247.

The Wild Birds' Protection Act of 1894, and the Future of British Oology. By Colonel W. H. M. Duthie. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 43-47.

The Distribution of the Chiff-chaff (*Phylloscopus rufus*) in the Clyde Area. By John Paterson. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 48-52.

Local Name of the Sheldrake. By Hugh Boyd Watt. *Zoologist* (4), vol. i. p. 571 (December 1897).—Gives Scottish and Gaelic forms.

Nesting of the Great Northern and Black-throated Divers in Shetland. By Bernard A. E. Buttress. *Zoologist* (4), vol. i. p. 509 (November 1897).—Note on the finding of the eggs of Colymbus glacialis on 2nd June.

On Cladodus Neilsoni (Traquair) from the Carboniferous Limestone of East Kilbride. By R. H. Traquair, M.D., LL.D., F.R.S. *Trans. Geol. Soc. Glasgow*, vol. xi. part i. pp. 41-50, pl. iv. (1897).

Lepidoptera in Ross-shire. By E. Meyrick. *Ent. Mo. Mag.* (2), vol. viii. p. 234 (October 1897).—The following species, not hitherto recorded north of the Caledonian Canal, were noticed at Gairloch early in September:—Acalla aspersana, Chelaria huebnerella, and Cerostoma costella.

Polyommatus astrarche, ab. quadripuncta, Tutt. By A. Horne. *Ent. Record*, vol. ix. p. 330 (15th December 1897).—A few specimens captured at Muchalls, Kincardineshire, in July last.

Sphinx convolvuli in Scotland. By W. M. Christy. *Entomologist*, vol. xxx. p. 298 (November 1897).—Specimen taken in September in Sutherlandshire.

Nemeophila plantaginis, ab. hospita and ab. rufa. By A. Horne. *Ent. Record*, vol. ix. p. 330 (15th December 1897).—Ab. rufa stated to be not uncommon on the Kincardineshire coast and near Aberdeen, where ab. hospita has never occurred. Ab. hospita is found on the higher moors.

Black Aberration of Nemeophila plantaginis. By Arthur Horne. *Ent. Record*, vol. ix. p. 260 (15th October 1897).—Refers to a specimen bred from a larva found on Scotston Moor, near Aberdeen, with the hind wings velvety black.

Tephrosia bistortata (crepuscularia) as a Scotch Insect. *Ent. Record*, vol. ix. pp. 258-259 (15th October 1897).—Notes by various observers on the occurrence of this species in Perthshire, Loch Long (Argyleshire), Forres, etc.

Epione vespertaria (parallelaria) in Roxburghshire, 1897. By William Hewett. *Ent. Mo. Mag.* (2), vol. viii. p. 255 (November 1897).—Three specimens captured by Mr. W. Renton near Hawick on 26th August 1897.

Acalla aspersana in Unst. J. J. F. X. King. *Ent. Mo. Mag.* (2), vol. viii. p. 279 (December 1897).—Refers to a previous record in vol. vii. p. 8 (1896).

Occurrence of Crambus perlellus, var. rostellus, in Ross-shire. By E. Meyrick. *Ent. Mo. Mag.* (2), vol. viii. p. 255 (November 1897).—Several examples met with near Gairloch early in September.

Rare Ayrshire Coleoptera, exhibited to Glasgow Nat. Hist. Society by Mr. Anderson Fergusson. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 136-137.

Coleoptera from Hoy, Orkney. By W. E. Sharp. *Ent. Mo. Mag.* (2), vol. viii. p. 236 (October 1897).—Twenty species collected in the summer of 1895.

Dytiscus lapponicus in the Island of Mull. By J. J. F. X. King. *Ent. Mo. Mag.* (2), vol. viii. p. 279 (December 1897).—A series captured in July 1897.

Habits of Sericomyia borealis, Fln. By Rev. E. N. Bloomfield. *Ent. Mo. Mag.* (2), vol. viii. p. 222 (October 1897).—Refers to three specimens bred by Mr. W. Sim, of Gourdas, Fyvie, Aberdeenshire.

Notes on Sunaristes paguri, Hesse, and some other rare Crustacea. By Thomas Scott, F.L.S., and Andrew Scott. *Ann. and Mag. Nat. Hist.* (6), vol. xx. pp. 489-494, pls. xi. and xii. (December 1897).—A female specimen of Sunaristes paguri from the Cromarty Firth, and Scottish specimens of Remigulus tridens, Diaptomus laciniatus, and Lathonura rectirostris, are described and figured.

On Bipalium kewense, Moseley. By Charles Hogg. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 53-54.—Found in Woodside Gardens, Paisley.

On the grasping power of Carboniferous Crinoid "Fingers" or "Branches," and a speculation as to whether the bulk of the Carboniferous Crinoidea were fixed or floating animals. By John Smith. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 58-61.

BOTANY.

The Nitrogenous Food of Plants. By A. P. Aitken, M.A., D.Sc. *Trans. Bot. Soc. Edin.*, 1897, xxi. pp. 1-20.—Being an address delivered at opening of Session on 12th November 1896.

Experiments with Nitragin. By William Somerville, D.Sc. *Trans. Bot. Soc. Edin.*, 1897, xxi. pp. 20-24.

The Bacteria of the Soil, with special reference to Soil Inoculation. By R. Stewart MacDougall, M.A., B.Sc. *Trans. Bot. Soc. Edin.*, 1897, xxi. pp. 25-40.

Excursion of the Scottish Alpine Botanical Club to Clova in July 1896. By William Craig, M.D., F.R.S.E. *Trans. Bot. Soc. Edin.*, 1897, xxi. pp. 40-43.—Enumerates many alpine species collected during the excursion.

Note on Ranunculus auricomus, L. By W. P. Winter. *Journ. Bot.*, Oct., pp. 406-407.—On the variations in structure of 308 flowers.

Berwickshire Rubi and Rosæ. By F. A. Rogers. *Journ. Bot.*, Nov., p. 450.—Names two forms of *Rubus* and ten of *Rosa*.

Pyrus Aria and its Varieties in Arran. By Rev. David Landsborough. *Trans. Bot. Soc. Edin.*, 1897, xxi. pp. 56-62.—Gives results of excursions in Arran in search of the peculiar Arran forms, and adds new localities.

Monograph of the British Species of Euphrasia (*continued*). By Frederick Townsend, M.A., F.L.S. *Journ. Bot.*, Oct. and Nov. 1897, pp. 395-406, 417-426, pls. 374, 375.—In these pages are included nine species of *Euphrasia* found in Scotland, with notes on their occurrence and on peculiar varieties.

Some Scotch Willow Hybrids. By W. R. Linton, M.A. *Journ. Bot.*, Nov., p. 443.—*S. phylicifolia* × *repens*, beside the Corriemulzie, in Braemar; *S. lapponum* × *phylicifolia*, from Glen Doll; *S. Arbuscula* × *herbacea*, from Corrie Ardran, Mid Perth; *S. herbacea* × *nigricans*, from Glen Fiagh, Clova.

Carex chordorhiza, Ehrhart, in Britain. By Edward S. Marshall and W. A. Shoolbred. *Journ. Bot.*, Nov., p. 450.—Near head of Loch Naver, W. Sutherland, in a spongy, sphagnous bog, on 4th August 1897.

New or Critical British Marine Algæ. By E. A. L. Batters, LL.B., F.L.S. *Journ. Bot.*, Nov., pp. 433-440.—Describes a number of species, among which are the following from Scotland: *Ulvella fucicola*, Rosenv., var. nov. *globosa*, epiphytic on *Sphacelaria racemosa*, Berwick; *Phæostroma prostratum*, Kuck., Cumbrae; *Mikrosyphar Polysiphoniæ*, Kuck., Berwick; *Hildenbrandtia Crouani*, J. Ag., Berwick; *Porphyrodiscus simulans*, nov. g. and sp., Berwick.

Observations on Plant Plankton. By George Murray, F.R.S. *Fifteenth Annual Report of the Fishery Board of Scotland*, part iii. pp. 212-218; reprinted in *Journal of Botany*, Oct. 1897, pp. 387-395.—Describes the results of work on West Coast in 1896, under "Methods," "Distribution," and "Reproduction of Diatoms."

Extinction of Deyeuxia stricta, Kunth, var. borealis (Læstad.) By G. C. Druce. *Journ. Bot.*, Dec., p. 491.—Records disappearance of the grass from its habitat—a small swamp near Killin Pier in Perthshire.

Proceedings of the Glasgow Natural History Society, Session 1896-97. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 129-150.—Numerous notices of plants from localities in Scotland, some being new records for districts.

Botanical Notes from Galloway for 1896. By James M'Andrew. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 72-74.—Several new records.

Notes on the Mycology of Kelvingrove Park. By William Stewart. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 75-79.—An interesting list.

On some Coll and Tiree Plants. By Symers M. Macvicar. *Trans. Nat. Hist. Soc. Glasgow*, 1896-97, pp. 55-57.

A List of the Algæ of Lamlash Bay, Arran, collected during September 1894. By David Robertson, LL.D., etc. *Trans. Nat. Hist. Glasgow*, 1896-97, pp. 62-71.

REVIEWS.

An Illustrated Manual of British Birds. By Howard Saunders, F.L.S., F.Z.S., etc. Second edition, revised. With illustrations of nearly every species. (London: Gurney and Jackson.)

Among all the books on British Birds that have been published —and their number now is almost legion—there is not one that is so *useful* and *indispensable* as "Saunders's Manual." We say this after years of almost daily use. Good, however, as the exhausted first edition was, we are able to aver, after a critical examination of the two parts issued, that, thanks to Mr. Saunders's increased and unrivalled knowledge of the subject and his painstaking and exhaustive researches, this second edition is more complete and accurate, and hence better, than its predecessor. And moreover it brings the subject absolutely up to date of publication—an indispensable desideratum to all who are interested in British Ornithology. It is thus with feelings of satisfaction that we hail the advent of this new edition, and have great pleasure in bringing this excellent work under the notice of our readers. The book is now being issued in parts at one shilling, and twenty parts complete the work.

A History of Fowling: Being an Account of the many Curious Devices by which Birds are, or have been, captured in Different Parts of the World. By the Rev. H. A. Macpherson, M.A. (Edinburgh: David Douglas, 1897.)

Those who are interested in the subject of Fowling,—and they are many among field naturalists,—to which this handsome small quarto volume is devoted, will find it a perfect repertory of information. The author has ransacked tomes ancient and modern, visited several Continental countries in search of facts and practical knowledge, and has culled from his numerous ornithological friends their stores of knowledge. Thus we have a practically exhaustive treatise, dealing with the art as practised in many lands and during all times. The older information is of considerable archæological value, as well as possessing a peculiar interest from the very quaintness of the implements used and the descriptions of the manner of their employment. All the various sections of the subject have been well ordered by the scientific arrangement of the subject-matter under orders and families of birds, so that speedy reference may be made as to the mode of capture, etc., of any of the species treated of—and they are many.

The book is illustrated by a photogravure frontispiece, full page plates, and numerous illustrations in the text; and these add much to the value and completeness of the work.

With Nature and a Camera: Being the Adventures and Observations of a Field Naturalist and an Animal Photographer. By Richard Kearton, F.Z.S. Illustrated by 180 Pictures from Photographs by Cherry Kearton. (London: Cassell and Company, Limited.)

In the "Annals" for 1896, p. 134, we noticed favourably a former work of the same author on "British Birds' Nests." To that work the one now under consideration is a worthy companion volume. Indeed, attractive as that book was, we have a decided preference for Mr. Kearton's latest production. For there is greater variety in its pictures and pages, hence a charm is lent to a handsome, beautifully illustrated, and interesting volume. The book opens with an account of a visit to St. Kilda, which in itself is one of the best that we have read; and it is made additionally attractive by the number, nature, and excellence of the pictures—over forty in number—which depict the scenes of bird-life and landscape described.

Special mention must be made too of the series of pictures devoted to bird-snaring, which is so successfully carried on by the St. Kildians, as being among the most interesting photo-pictures we have seen. We would point out that Mr. Kearton includes the Common Gull in his list of the birds of St. Kilda and omits the Kittiwake, though he mentions the latter but not the former in his narrative. We must also remark that the scientific name of the Guillemot is NOT *Uria bruennichi*.

Leaving St. Kilda, the book covers varied ground, as do also the illustrations, which range in subject from a Red Underwing Moth at rest on the bark of a tree, to the Water Vole at home on the banks of his native stream. Several of the articles deal with areas in Wild Scotland.

Memories of the Months: Being Papers from the Notebook of a Field Naturalist and Antiquary, to wit, Sir Herbert Maxwell, Bart., M.P. (London: Edward Arnold, 1897.)

Anything from the facile pen of Sir H. Maxwell is sure to prove of interest and to commend itself to the reader, and the present pretty volume is certainly no exception, for it is seldom we have read anything that has given greater pleasure than these "Memories of the Months." Under this title the author has put together, from his notebook, ninety-one short essays illustrative of the never-ceasing industry, economy, and beauty of Nature, and the perpetual attractions of out-door life in the country in every month and season of the year.

Sir H. Maxwell's notes cover a very wide area, from the treeless wilds of Caithness to the flowery banks of a Hampshire trout stream. In page after page he pleasantly discourses of the many fair,

shy creatures in fin, feather, and fur which still continue to haunt the wilds of Great Britain—notes too on reptiles, insects, plants, and flowers. Nothing is too commonplace, nothing too trivial—interest and beauty are everywhere, if we only take the trouble to look for them.

The author is no carpet naturalist, and the great charm of this book is its delightful freshness and the knowledge that the facts were jotted down in the presence of the objects described. Thus, when lying in acres of boulders on the top of Beinn Eibhinn, far above the heather line, and 3700 feet above sea level, in Corrour forest, surrounded with semi-darkness and in a gale, shivering too with cold under the damp cloud-mantles, we still find him, like a true naturalist, jotting down notes on his near but unconscious companions the purring, chuckling Ptarmigan, the restless Blue Hare, the piping Golden Plover, and the ubiquitous Raven; nor does he overlook the weather-wan mosses and the scant arctic flora which carpet the spaces between the rough gray shingle. The half dozen plates are all excellent, but we would specially call attention to the frontispiece by Mr. Thorburn, representing the last Golden Eagle of the Merrick, one of this talented artist's most lifelike productions.

This little volume is nicely got up and printed, charmingly written and charmingly illustrated, and cannot fail to please.—J. C.

Among British Birds in their Nesting Haunts: Illustrated by the Camera. By Oswin A. J. Lee. (Edinburgh: David Douglas.)

Since our previous notice ("Annals," 1897, p. 61) this fine work has reached its seventh part. We observe with pleasure that the high standard of excellence in the reproduction of the pictures, to which we referred as being so high in the earlier parts, has been fully maintained.

A Handy Guide to Fish Culture, or Fish Culture made easy: Being specially designed for the use of Amateurs, and for guidance in the Improvement of Fisheries. By J. J. Armstead. Published by The Angler, Limited, Scarborough and London.

This little book deals in a thoroughly practical way with the various piscicultural subjects covered by its title. It is, we may say, written by one who is a master of the subject, and whose experience extends over many years. We have no hesitation in highly recommending it to all in want of advice or information on the important matters upon which it treats.

The Annals
of
Scottish Natural History

No. 26] 1898 [April

A CONTRIBUTION TO THE AVIFAUNA OF WEST ROSS-SHIRE.[1]

By J. B. Dobbie, F.R.S.E., F.Z.S.

West Ross-shire has of late years attracted considerable attention from ornithologists. Mr. J. A. Dixon, in his excellent book on Loch Maree, gives a very full and interesting account of the birds of that district. Messrs. Hinxman and Eagle Clarke contributed to the "Proceedings of the Royal Physical Society of Edinburgh," vol. xii. part ii., 'A Contribution to the Vertebrate Fauna of West Ross-shire,' which deals mainly with the Applecross, Lochcarron, and Loch Torridon districts, and which is a valuable production. What may be termed a supplementary list to that of Mr. Dixon was contributed to the "Annals of Scottish Natural History" for April 1896, by Mr. A. H. Evans; and lastly, an account of the birds observed by Mr. Harvie-Brown during a short visit paid by him to Priest Island in July 1884 was published in the "Transactions of the Norfolk and Norwich Naturalists' Society."

The extreme north-west of the county, as it is now

[1] Read at a meeting of the Scottish Natural History Society, Edinburgh, on 7th October 1897.

constituted, seems, however, to have been almost overlooked by ornithologists. I say almost, because the district which extends from Ullapool to Rhu Coigach (a distance of 30 miles or more) formed at the time the work was written a detached part of the county of Cromarty, and was included in the area described by Messrs. Harvie-Brown and Buckley in their "Vertebrate Fauna of Sutherland, Caithness, and West Cromarty." It was only to be expected, however, that, even in so comprehensive a work as this, the authors should have been able to devote but a meagre portion of their space to a district whose fauna could differ from that of the adjoining regions of Sutherland only in respect of its greater poverty.

My friend the Rev. Horatius N. Bonar, who has on several occasions visited Coigach in autumn, had been greatly impressed with the number of birds which he always found there at that season ; and he naturally enough concluded that the locality must in spring also be rich in bird-life. Not quite sharing this opinion, I nevertheless thought that a region so remote and so sparsely populated might be likely to afford good results.

As a matter of fact, however, the physical conditions of the district are not conducive to a rich avifauna. The almost total absence of trees forms an insuperable barrier to the presence of the vast majority of our small song-birds. The aspect of the most part of Coigach is forbidding and sinister in the extreme. Here and there along the shores of the lochs, or by the side of some rugged mountain torrent, a few stunted birch trees contrive to exist in spite of the sterility of the soil and the rigours of the winter ; but their presence, far from lending pleasure to the eye, only brings into bolder display the poverty of their surroundings. The description of it given by Dr. Ross in the "New Statistical Account" is as literally true now as it was then : "The appearance is that of a wide and dreary waste of bleak and barren heath, as if a segment of the great ocean, agitated and tossed and troubled, not by an ordinary storm, however violent, but by some frightful convulsion of nature, with here and there a rude and lofty peak of rugged rock towering to the skies, had been suddenly condensed and formed into a solid and shapeless mass of unproductive desert, without one spot of

green on which to rest the eye." But yet Coigach is far from wanting an impressive beauty of its own. It is jewelled with lakes, many of which are of considerable size. Lonely and desolate they are in all verity, but their very loneliness imparts to them a savage grandeur, which is greatly intensified by the lofty and remarkable hills which dominate them. For the most part the sea-coast is deeply indented, and bold headlands with beetling precipices extend as far as the eye can reach. Here the scenery is magnificently grand, and the effect is greatly heightened by the rugged and storm-swept Summer Islands, whose appearance, as seen from the mainland, would seem to convey to the onlooker the idea that dreary and desolate as are his immediate surroundings, a drearier and still more desolate region lies beyond. At Auchnahaird Bay there is a veritable sand-dune which extends for about half a mile, and which is the chosen home of the Rabbit and the Wheatear, and where, among the shingle, the wary Ringed Plover nests. In autumn, as Mr. Bonar informs me, this bay is visited by many rare and interesting migrants on their way from their home in the far north to their winter quarters in the sunny south. But, judging from the paucity of feeding grounds, and the fact that Coigach lies outside the great migration route, I am of opinion that the number of species which appear there at that season must be very limited.

Before proceeding to enumerate the different species of birds which we observed during our stay in Coigach, it may perhaps be well to offer some explanation of the poverty of the list. In the first place, the district is, as I have already pointed out, practically a treeless waste, which offers no shelter whatever except to the hardiest of moorland birds. But even on the moors one is struck by the scarcity of ground-nesting birds. This feature was observed farther to the south by Messrs. Hinxman and Eagle Clarke, who account for it by the excessive rainfall and by the nature and lie of the rocks, which are unfavourable to an effective surface drainage. To these causes I am inclined to add (in Coigach) the superabundance of adders, which are so common as to be an intolerable nuisance. Finally, it has to be borne in mind that Coigach is mostly a crofter

country, and where crofters exist it is impossible for those birds to multiply whose eggs might be welcomed as an addition to a meal, and it goes for the saying that a crofter's palate is not over-fastidious.

1. Turdus musicus, *Linn.*, Song Thrush.—Far from common. A nest containing five eggs was found in a birch wood which skirts Loch Owskeich. This nest, which, though in the midst of a comparatively thick wood, was nevertheless placed on the ground, and was very artfully concealed among the roots of a birch tree, being covered exteriorly with birch bark in such a way as closely to resemble its surroundings. Indeed, had not the bird been disturbed the nest would, in all probability, have been overlooked. Whilst making our way through a rugged ravine, and at a considerable elevation, we were somewhat astonished to flush a Song Thrush. We were much amused by the utter indifference to our presence which this bird displayed.

2. Turdus merula, *Linn.*, Blackbird.—A few seen in or near Ullapool.

3. Turdus torquatus, *Linn.*, Ring Ouzel.—Fairly common.

4. Saxicola œnanthe (*Linn.*), Wheatear.—Abundant. One of the commonest birds in Coigach.

5. Pratincola rubetra (*Linn.*), Whinchat.—Tolerably common.

6. Pratincola rubicola (*Linn.*), Stonechat.—Fairly common. Frequently seen perching on the telegraph wires.

7. Ruticilla phœnicurus (*Linn.*), Redstart.—Not uncommon.

8. Erithacus rubecula (*Linn.*), Robin.—Thinly distributed.

9. Regulus cristatus, *K. L. Koch*, Golden-crested Wren.—Heard at Braemore, but not observed in Coigach.

10. Phylloscopus trochilus (*Linn.*), Willow Wren. — Very common, being found wherever there is wood to afford it shelter. During my stay in Coigach, nothing surprised me more than the hardiness of this delicate little bird. No matter how extensive or how dreary the moorland, if a solitary stunted shrub struggled for existence beside a mountain mere the Willow Wren was certain to be heard singing.

11. Cinclus aquaticus, *Bechstein*, Dipper.—Two pairs observed, one frequenting the Garvie Burn, and the other the Owskeich Water.

12. Parus ater, *Linn.*, Coal Titmouse.—Several seen in the small plantations which skirt lochs Owskeich, Bad-a-Ghaill, and Lurgan.

13. Parus cœruleus, *Linn.*, Blue Titmouse.—One seen at Drumrunie, where there is a plantation of considerable size.

14. Troglodytes parvulus, *K. L. Koch*, Wren.—Heard, and disused nest found, in the wood which skirts Loch Bad-a-Ghaill.

15. Motacilla lugubris, *Temm.*, Pied Wagtail.—A pair seen at Achiltibuie.

16. Anthus pratensis, *Linn.*, Meadow Pipit.—Very abundant on the moor and hillsides. We found many nests with eggs.

17. Anthus obscurus (*Latham*), Rock Pipit.—Abundant in suitable localities.

18. Chelidon urbica (*Linn.*), Martin. — A few pairs nest at Auchnahaird, and one pair at least at Rudh'a Choin. This bird is not included in Messrs. Hinxman and Eagle Clarke's list of the birds of West Ross-shire, while Mr. Dixon asserts that it is undoubtedly decreasing in numbers. It is nevertheless still common at Ullapool, while several pairs nest under the eaves of the quaint inn at Altguish.

19. Cotile riparia (*Linn.*), Sand Martin.—Four or five pairs nest in the sandhills at Auchnahaird. On the 26th June, Mr. Bonar found that, with the exception of one pair, whose brood had just been hatched, the birds had all departed.

20. Passer domesticus (*Linn.*), House Sparrow.—This familiar bird has only of recent years found its way into West Ross-shire. We found it quite common at Achiltibuie, while several pairs nested in the ivy which was trained against the wall of Auchnahaird House. Elsewhere in Coigach I found this bird extremely rare, though I have no doubt that it is resident in more or less abundance in every crofter hamlet in the peninsula.

21. Fringilla cœlebs, *Linn.*, Chaffinch. — Far from common, though, as a rule, found wherever there are clumps of trees. We observed several while driving past Drumrunie shooting lodge, where there is a considerable plantation of conifers.

22. Pyrrhula europæa, *Vieillot*, Bullfinch. — Not observed in Coigach proper. Near Loch Droma we saw a pair in a clump of fir trees behind the hut where the mail-coach stops to have the horses changed.

23. Emberiza miliaria, *Linn.*, Corn Bunting.—Found all over the peninsula wherever there are crofts, and is one of the most characteristic birds of the district. Only met with in close proximity to human dwellings, it has here become exceedingly tame and confiding. Its song was continued till far into the twilight of the summer evening, long after every other passerine bird was mute; and it is to my mind decidedly ventriloquial in its effect. Again and again I was deceived by it, imagining the bird was quite near when in reality it was perched at some considerable distance off.

24. Emberiza citrinella, *Linn.*, Yellow Bunting.—Fairly common, even on the wildest moors.

25. Emberiza schœniclus, *Linn.*, Reed Bunting.—Fairly common.

26. Sturnus vulgaris, *Linn.*, Starling.—Common. Young were abroad by the time we arrived (2nd June).

27. Corvus monedula, *Linn.*, Jackdaw.—Not found in Coigach. It nests in some numbers in the cliffs near Leekmellm, a few miles east of Ullapool.

28. Corvus corax, *Linn.*, Raven.—I was much disappointed to find that even in so remote and lonely a district as Coigach the Raven is very rare. We saw a nest on a cliff near Camas Coille, which in all probability was that of a Raven; indeed we were assured by our ghillie that a pair nest there regularly every year. The bird certainly nests on one at least of the Summer Islands, but I am of opinion that not more than two pairs now breed in Rhu More. This unfortunate state of matters is, in all probability, due to the fact that Coigach is a crofter country; and wherever crofters exist the Raven is subjected to ceaseless persecution on account of the damage, real or imaginary, which it does during the lambing season.

29. Corvus corone, *Linn.*, Carrion Crow.—One seen at Garvie Bridge; was seen quite distinctly.

30. Corvus cornix, *Linn.*, Hooded Crow.—Very abundant, especially in south Coigach, and we met with it everywhere, even in the Summer Islands. On Camas Coille Mr. Bonar observed a pair of Hoodies repeatedly swoop at a Peregrine Falcon, which did not deign to resent their impudence.

31. Corvus frugilegus, *Linn.*, Rook.—Quite common near Ullapool, where there is a small rookery. I never saw the bird in Coigach proper, but Mr. Bonar observed quite a large flock feeding at the landing-place at Achiltibuie.

32. Alauda arvensis, *Linn.*, Skylark.—Very abundant everywhere, even on the bleakest and most desolate parts of the moor. To those who are accustomed to associate the Skylark with the highly cultivated fields and rich meadows of England and Southern Scotland, Hogg's apostrophe must seem singularly inappropriate; but in Coigach this is a veritable "bird of the wilderness." Heard in such a place, its exquisite song has an indescribable charm. Mr. Bonar informs me that he heard several Skylarks near Auchnahaird—the haunt of the Ringed Plover—repeatedly introduce a perfect imitation of the call note of that bird into their song.

33. Cypselus apus (*Linn.*), Swift.—A pair of these birds were observed on three different occasions at Rhu-dh'a Choin. The birds no doubt nested in some crevice in the cliffs.

34. Cuculus canorus, *Linn.*, Cuckoo.—Several seen and heard, but the bird is far from common.

35. Aquila chrysætus (*Linn.*), Golden Eagle.—The gamekeeper at Drumrunie informed us that there are two eyries of this bird under his protection. The Golden Eagle seldom visits the coast region, but confines itself to the mountain fastnesses. None of our ghillies had ever seen one; and, grossly ignorant of ornithology as they mostly are, it is hardly credible that they could have overlooked so conspicuous a bird.

36. Accipiter nisus (*Linn.*), Sparrow Hawk.—One seen.

37. Falco peregrinus, *Tunstall*, Peregrine Falcon.—A pair nest on cliff at Camas Coille. Mr. Bonar repeatedly observed a Peregrine hawking for food over a field of rye grass at Auchnahaird. Its visits are always made at the same time, viz. about 1 P.M. and 6.30 P.M.

38. Falco æsalon, *Tunstall*, Merlin.—Mr. Bonar observed one flying close to Auchnahaird House.

39. Falco tinnunculus, Kestrel.—Tolerably common.

40. Phalacrocorax carbo (*Linn.*), Cormorant.—Very common. The bird nests in large numbers in several of the Summer Islands, but not, so far as I am aware, in Coigach. We found this bird to be a much earlier breeder than its congener, the Shag. While the former had, in the beginning of June, in several instances young almost ready to fly, the latter had just commenced to nest, and breeding was not at all general until the end of the month.

41. Phalacrocorax graculus (*Linn.*), Shag.—Very common. Nests in considerable numbers in caves at Camas Coille. It also breeds abundantly in the Summer Islands. Its nest is far more difficult of access than is that of the Cormorant.

42. Ardea cinerea, *Linn.*, Common Heron.—There is a small heronry in an islet on Loch Bhadaghaill.

43. Anser cinereus, *Meyer*, Graylag Goose.—This fine bird is very common, and breeds freely in islets in one or two of the lochs. We observed a pair of adults with their brood swimming on one of the lochs, which, for obvious reasons, I think it better not to name. This Goose frequents many of the Summer Islands, but I am decidedly of opinion that it breeds in none of them.

44. Tadorna cornuta (*S. G. Gmelin*), Sheld Duck.—Very rare.

45. Anas boscas, *Linn.*, Mallard.—Not very common. Mr. Bonar observed a duck with eleven young swimming in Loch Raa.

46. Querquedula crecca (*Linn.*), Teal.—We only observed this bird on Loch Bhattachan; but it no doubt nests freely in suitable localities throughout the district.

47. Mergus merganser, *Linn.*, Goosander.—This handsome bird is common in Coigach. We found fragments of eggs both on the mainland and on the Summer Islands; and I have no doubt that these eggs, which were quite fresh, had been sucked by Crows.

48. Mergus serrator, *Linn.*, Red-breasted Merganser.—Tolerably common, though not so often met with in Coigach proper as the preceding species. Mr. Bonar was fortunate enough to observe a most amusing encounter which one of these birds had with a flounder which it had caught in Reiff Loch. It was only after repeated efforts that the bird was able to swallow its victim.

49. Columba palumbus, *Linn.*, Ring Dove.—Two seen.

50. Columba livia, *J. F. Gmel.*, Rock Dove.—One seen feeding in barley field at Auchnahaird. Nests in Isle Ristol and Eilean Mullagrach as well as in many of the Summer Islands.

51. Lagopus scoticus (*Lath.*)—Fairly numerous, but the bird is nothing like so common as I had expected to find it. Under existing conditions, the bird never can be abundant in Coigach.

52. Lagopus mutus (*Montin*), Ptarmigan.—Found only near the summit of Ben More Coigach, and even there in very limited numbers.

53. Crex pratensis, *Bechst.*, Land Rail.—Pair nest at Auchnahaird, also at Ullapool.

54. Ægialitis hiaticula (*Linn.*), Ringed Plover.—Seven or eight pairs nest on the shingle in Auchnahaird Bay. Several nests were found. We found this Plover also breeds on the west side of the peninsula, but only in very small numbers.

55. Charadrius pluvialis, *Linn.*, Golden Plover.—Thinly distributed over the moorlands.

56. Vanellus vulgaris, *Bechst.*, Lapwing.—Very abundant.

57. Hæmatopus ostralegus, *Linn.*, Oyster-Catcher. — Very abundant. Breeds in large numbers, especially on the islands.

58. Gallinago cœlestis (*Frenzel*), Common Snipe. — Several pairs nest in the damp meadows at Auchnahaird. One evening our ghillie promised to show us the nest of the solitary pair of Corncrakes which nest in Coigach. On accompanying him to the spot, we found the nest to be that of a Snipe!

59. Totanus hypoleucus (*Linn.*), Common Sandpiper—Abundant, nesting on the margins of nearly every freshwater loch in the district visited by us. Occurs also in the Summer Islands.

60. Totanus calidris (*Linn.*), Common Redshank.—We found the head of a Redshank in the Peregrine's eyrie in Priest Island, and it may therefore be assumed that this bird nests in Coigach. Neither Mr. Bonar nor I, however, saw or heard it during our visit.

61. Numenius arquata (*Linn.*), Common Curlew.—Fairly common. Nests on one or more of the Summer Islands.

62. Sterna macrura, *Naumann*, Arctic Tern.—Very common. It is, here at least, a very late breeder, and though we visited several breeding sites we saw very few eggs even up to the 25th June! I am decidedly of opinion, however, that these birds are, during the nesting season, subjected to ruthless persecution. We found a large colony inhabiting a rock off Rhu-dh'a Choin, which we visited on 9th June. On our approach the birds showed great alarm, although there were only four eggs on the islet.

63. Larus ridibundus, *Linn.*, Black-headed Gull.—Pair seen in Baden Bay, and Mr. Bonar observed several following the plough at Auchnahaird.

64. Larus canus, *Linn.*, Common Gull.—Very abundant. Nests on precipitous cliffs near Camas Coille, and, like the next species, on large stones in one of the bigger freshwater lochs.

65. Larus argentatus, *J. F. Gmel.*, Herring Gull.—Tolerably common.

66. Larus fuscus, Lesser Black-backed Gull.—The most abundant Gull of the district.

67. Larus marinus, *Linn.*, Great Black-backed Gull. — Fairly common, but many of the birds observed on the mainland were immature.

68. Rissa tridactyla, Kittiwake.—Mr. Bonar tells me he observed a pair diving in Baden Bay. He saw them repeatedly, and is quite certain of his identification.

69. Alca torda, *Linn.*, Razorbill.—Nests on one at least of the Summer Islands.

70. Uria troile, *Linn.*, Common Guillemot.—Observed in large flocks in Baden Bay.

71. Uria grylle, *Linn.*, Black Guillemot.—Very abundant. Mr. Bonar found it nesting in the cliffs near Reiff. The male has a very beautiful crooning note which it utters to its mate while swimming, and which, when heard on a still summer evening, is very pleasing.

72. Fratercula arctica, *Linn.*, Puffin.—Fairly common on some of the Summer Islands, and nesting on at least two of them.

73. Colymbus arcticus, *Linn.*, Black-throated Diver.—Mr. Bonar observed one on Loch Bhattachan on two different occasions. My inquiries at our ghillies elicited no information which showed that they were at all acquainted with the bird.

74. Procellaria pelagica, *Linn.*, Storm Petrel.—We found the remains of one of these birds, which had probably been killed by a Peregrine Falcon, on one of the Summer Islands. It is no doubt fairly common, but owing to its nocturnal habits and the ignorance of the natives it has escaped observation.

Such is the brief account of the birds which we were able to associate with Coigach during our brief sojourn in that remote district. Should subsequent investigation prove it inadequate or defective, it ought to be borne in mind that our stay in the region in question was far too short for our purpose; and further, that this very circumstance prevented us from even attempting to explore the hills beyond an elevation of about 700 feet above the sea-level. Yet even if we had had the opportunity of doing so, I am very doubtful that the results of our research would have repaid the trouble.

I have to acknowledge my indebtedness to my friend, the Rev. Mr. Bonar, for a large part of the material contained in my paper. I was indeed very fortunate in having for my

companion so accomplished a field naturalist. His knowledge of our birds is so good, and his power of observation so keen, that nothing in the least worthy of interest escaped him. Besides, his very much longer stay in Coigach afforded him the means of visiting many spots unvisited by me, and of gleaning many opportunities of acquiring information.

THE BIRDS OF THE ISLAND OF BARRA—ADDITIONS AND NOTES.

By John MacRury, M.B.

In order to bring up to date my list of the Birds of the Island of Barra, which was published in the "Annals" in 1894, with a few Additions in January 1896, I have now to add the following species which have since then been observed in the Island, and I note them down in the order in which they were met with :—

Yellow Bunting, *Emberiza citrinella*.—On the 18th December 1895 a solitary bird was secured in my garden here. This is the only one of the species I have ever seen on the island, and I think its occurrence in the southern end of the Outer Hebrides must be rather rare.

Buffon's Skua, *Stercorarius parasiticus*.—Mr. William Macgillivray identified a bird of this species flying over the sea at Eoligary on the 12th May 1896. This Skua has been found in Benbecula and North Uist, but this is the first record from Barra.

Swallow, *Hirundo rustica*.—I found a nest with five eggs on the 15th of June 1896 : the first, I think, that has been found in the island.

Mealy Redpoll, *Acanthis linaria*.—On the 8th October 1896 Mr. Macgillivray secured a good specimen of the Mealy Redpoll, which is now in his collection at Eoligary. The Lesser Redpoll had been previously observed by myself and others on the island, but not this species.

Night Heron, *Nycticorax griseus*.—A young Night Heron was shot on the 12th October 1896 at Northbay in this island by Mr. C. V. A. Peel. The bird was afterwards seen in the flesh by Mr. Eagle Clarke. Mr. Peel recorded the occurrence at the time in the "Annals."

Ring Ouzel, *Turdus torquatus*.—When quietly walking my pony along the road near a small plantation here on the 8th April 1897, a solitary Ring Ouzel flew across the road right in front of me. The gamekeeper was walking beside me, and as the bird alighted again near the road, we had plenty of time to identify it. I heard that one of the species—probably the same bird—was seen a few days subsequently on the west side of the island. I have never seen a Ring Ouzel in any part of the Outer Hedrides before this, although I believe it has been observed in Lewis and Harris.

Golden-crested Wren, *Regulus cristatus*.—On the same date on which I met with the Ring Ouzel, 8th April 1897, Mr. Wm. Macgillivray, Eoligary, secured a Goldcrest in his garden, one of several, and a few of the species were observed by him on the 12th and 24th of the same month near the same locality. Mr. Finlayson, Schoolmaster, Island of Mingalay, told me that he also, on the 19th of the same month, found a Goldcrest at his bedroom window quite exhausted. This is the first time the species has been observed in Barra, although birds may have touched the Barra Group before this in migration.

Siskin, *Chrysomitris spinus*.—On the 29th October 1897 I observed a couple of Siskins in my garden, and from this date up to the 9th of the following month fully a dozen of the species were seen by myself and by Mr. Macgillivray in various parts of the island. They were not at all shy, and, although when they got on the wing they flew off apart, they generally associated with Twites, Chaffinches, Greenfinches, etc., about the fields and gardens. I do not find any record of the occurrence of the Siskin in any part of the Outer Hebrides, so that this must be the first record from the Group.

There are two or three species which were omitted in my former contributions, but which I find have undoubtedly been met with in Barra. I think I ought to add them now to the list of the birds of the island. These are:—

Chough, *Pyrrhocorax graculus*.—The Chough was found by Mr. Macgillivray in the southern islands of Barra in 1830, as mentioned in his paper in the "Edinburgh Journal of Natural History and Geographical Science" for that year. The bird, however, seems to have deserted the locality soon after this date, and no recent record of its occurrence can be found.

Garganey, *Querquedula circia*.—In Messrs. Harvie-Brown and Buckley's "Vertebrate Fauna of the Outer Hebrides," Appendix D, it is stated that a Garganey Duck was shot in Barra

in 1863 by Mr. Colin M'Vean, C.E., and that the specimen is in the collection of the late Sir John Campbell Orde, Bart., of Kilmory.

FULMAR, *Fulmarus glacialis*.—Gray, in his "Birds of the West of Scotland," mentions that the Fulmar once bred in the south isles of Barra, but that none had been seen there in the breeding season since 1844. They certainly have not been breeding there for a long time now, but no doubt some may occasionally be seen near the shores, though not often.

In my former lists I mentioned several species of which only one example had been then observed in Barra. Since then, however, more specimens of some of these have been met with, and some of them may be now regarded as regular visitors on migration. Of these, I may mention the—

WHITETHROAT, *Sylvia cinerea*, and the WILLOW WREN, *Phylloscopus trochilus*, as regular summer visitors.

SEDGE WARBLER, *Acrocephalus phragmitis*.—A pair has visited us once or twice since the first recorded example.

DIPPER, *Cinclus aquaticus*.—Has been seen almost every year since first record.

BRAMBLING, *Fringilla montifringilla*.—Several seen during last two winters.

RING DOVE, *Columba palumbus*.—One or two seen almost every summer and autumn.

TURTLE DOVE, *Turtur communis*.—A pair of these birds was seen at Eoligary on 22nd May 1897: the only examples of the species seen since the first record in September 1895.

ICELAND GULL, *Larus leucopterus*.—A few visit us almost every winter.

GLAUCOUS GULL, *Larus glaucus*.—Though occasionally seen, this bird is not so common as the Iceland species.

The BLACKBIRDS are now breeding in numbers all over the island. A few pairs of the HOUSE SPARROW are also breeding, but confine themselves to Castlebay, being as yet evidently too aristocratic to leave the capital of Barra.

BARRA, *March* 9, 1898.

ON A PECULIAR CHARR FROM INVERNESS-SHIRE.

By R. H. Traquair, M.D., LL.D., F.R.S.

On the 7th March I received for the Museum, from Mr. Harvie-Brown, a fish which had been sent to him by Mr. D. Watson, fishing-tackle maker, Inverness, as having been taken on the 28th February by a local angler "in the tidal water of the Ness." Mr. Watson also proceeds to say: "The fish seems to be peculiar, and to differ from the ordinary sea trout. The fins are unusually large for its size, and are tipped with orange; the tail is forked, and the scales are very small. I have shown the fish to several gentlemen, who have not seen anything similar in their experience."

That the fish was a Charr was at once suggested by the small scales and the pale edges of the fins on the lower aspect of the body; but the colour was altogether aberrant, being dark and blackish on the back and sides, without any trace of spots whatever. Moreover, the tidal water of a river is hardly the place where we would expect to find a Charr, which, according to Day, "appears to require very pure and mostly deep water for its residence."

The fish measures $10\frac{3}{8}$ inches from the tip of the snout to the extremities of the rays of the centre of the caudal fin. The length of the head, $2\frac{1}{4}$ inches, is rather more than the depth of the body at the front of the dorsal fin, and is contained about $4\frac{1}{2}$ times in the total up to the middle of the caudal. The maxilla extends backwards to slightly behind the eye; the teeth are very small, and those on the vomer are confined to the "head" of that bone. The fins are *very large*, the pectoral being as long as the entire head, so that its posterior extremity reaches back to $\frac{1}{4}$ inch from the origin of the ventral, which in turn reaches to $\frac{1}{2}$ inch from the beginning of the anal, and is about as long as the front part of the dorsal is high. The caudal fin is also large and emarginate. So far as can be ascertained by counting the rays through the skin, the fin formula is—D. 13; P. 13; V. 9; A. 12.

The colour on the back and sides is blackish, passing into a dirty or grayish white along the belly, there being, however,

a flush of orange red at the origin of the pectoral and ventral fins. There are no pale rounded spots on the body, but on the sides there is a *faint* appearance of vertical bars of alternating darker and lighter colour. The dorsal and caudal fins are dark and sooty in colour ; the pectoral, ventral, and anal fins are paler, and have their anterior margins of a yellowish white.

On opening the abdomen the specimen was found to be a male.

Among the forms of British Charr described by Günther as distinct species, but considered by Day to be only varieties of *Salmo alpinus*,[1] is one to which the present specimen makes so close an approach as to seem to be actually referable thereto. This is the *Salmo Killinensis* of Günther[2] from Loch Killin in Inverness-shire. I have not seen a specimen from that lake, but the present specimen agrees very closely with Dr. Günther's description and figure in general form, and in the proportional measurements of the body and fins, *Salmo Killinensis* being also remarkable for the large size of the last named appendages. The general coloration is also tolerably similar, but with one marked difference: Dr. Günther's fish is described and figured as having a number of pale spots on the sides, which in the fish now before me are entirely absent.

Without discussing the question as to whether *Salmo Killinensis* is entitled to be considered as a "good" species, or merely as a variety of that apparently very variable form *S. alpinus*, we cannot go wrong in referring to it the specimen which has formed the subject of this communication ; and the absence in it of pale spots on the sides may be looked upon as only a still further instance of the variability to which these fishes are subject. It is surely, however, very unusual to find a Charr in the tidal water of a river such as the Ness, and I must own that I am not acquainted with any similar case.[3]

[1] Day, "British Fishes," vol. ii. pp. 112-114.

[2] "Proc. Zool. Soc. Lond.," 1865, pp. 693-699, pl. xi. "Cat. Fishes, British Museum," vol. vi. p. 130.

[3] Since the above lines have been in type, Mr. Harvie-Brown has sent me a further communication on the subject, which he has received from Mr. Watson, and from which I extract the following :—"Loch Killin is ten miles from Foyers, and is connected with Loch Ness by the Foyers river. Is it possible that the fish reached Loch Ness over the falls? During the past winter, Loch Ness was high, and the Ness was often in flood. I cannot discover that Charr have ever been seen or caught in the Ness before."

FURTHER NOTES ON SAW-FLIES (*TENTHREDINIDÆ*) FROM THE SUMMIT OF BEN NEVIS, INCLUDING A SPECIES NEW TO BRITAIN.

By Rev. F. D. Morice, M.A., F.E.S.

Among the Hymenoptera taken by Mr. Bruce on Ben Nevis in 1895, and reported on in the "Annals" (1896, pp. 165-168) by the Rev. A. Thornley, are some specimens which I determined for Mr. Thornley as *Selandria flavescens*, Thoms., and which he consequently recorded under that name.

Flavescens, Thoms. = *flavens*, Klug., and the latter name, having the priority, should be adopted. I find, however, what is of more consequence, that the specimens in question are not all of one species. Most of them are correctly referred to *S. flavens*, Klug., but a few belong to a distinct though very similar species, viz. *S. Wüstneii*, Konow.

Wüstneii differs from *flavens* by its thicker antennæ, which have the third joint very slightly longer than the fourth. It is also a darker insect, with the clypeus, the pronotum, and the bases of the antennæ quite black; the costa and stigma, however, are on the contrary lighter than in *flavens* (brown, not black).

Selandria Wüstneii was first described by Konow in May 1885 ("Wien. Ent. Zeit.," iv. p. 122) from North German specimens. I know no record of its appearance elsewhere, unless the "aberrations *a* and *b*" of *flavens* mentioned in Cameron's "Monograph" (i. p. 196) belong to it; but it may easily have been mistaken for *flavens* by collectors both in this country and on the Continent.

Perhaps I may be allowed to take this opportunity of making a few other corrections in the list of Mr. Bruce's captures (*l.c.* pp. 166, 167), as follows:—

For *Tenthredo dispar*, Klug., read *Tenthredo atra*, Linn., var. *dispar*, Klug.
For *Tenthredo viridis*, Linn., read *Rhogogastera viridis*, Linn.
For *Pamphilius stellata*, Christ., read *Lyda stellata*, Christ.
For *Dolerus lateritius*, Klug., read *Dolerus madidus*, Klug.

For *Dolerus pratensis*, Thoms., read *Dolerus pratensis*, Linn.

Dolerus elongatus, Thoms., is considered by Konow to be only a variety of *æneus*, Htg.

Dineura viridiorsata = *Dineura nigricans*, Christ.

Nematus acuminatus, Thoms. I had some doubt about my identification of the ♂ of this species, but Herr Konow tells me it is correct.

As the whole genus (or rather group of genera) *Nematus* is in process of revision by Herr Konow, and many alterations in its synonymy may be expected, I do not think it worth while to revise my provisional determinations of Mr. Bruce's specimens at present.

WOKING, *January* 1898.

ON THE FLORA OF TIREE.

By SYMERS M. MACVICAR.

(*Continued from p.* 38.)

POLYGALA VULGARIS, *L.*—Rare; Salum Bay, a few plants.

POLYGALA SERPYLLACEA, *Weihe.*—Common; prostrate on exposed sandy ground.

SILENE MARITIMA, *With.*—Common, but rather local; most plentiful on sand dunes; occurs also on rocks and sea cliffs, in the latter place being larger and more luxuriant.

LYCHNIS DIOICA, *L.*—Rare; among rocks at Kenavara and Hynish Head.

LYCHNIS FLOS-CUCULI, *L.*—Common in damp pastures.

CERASTIUM TETRANDRUM, *Curtis.*—Very common in sandy places.

CERASTIUM GLOMERATUM, *Thuill.*—Common; mostly by roadsides, waste places, and cultivated fields.

CERASTIUM TRIVIALE, *Link.*—Very common everywhere, except in the central moorish ground and salt marshes.

STELLARIA MEDIA, *Cyr.*—Very common among cultivation and in waste places; occurs also in crevices of rocks at Cliad cliffs where cattle and sheep frequent, and on the floor of caves at Kenavara Head, which these animals cannot reach, but which are much frequented by rock doves and starlings. The plant has probably been at first brought to these caves by birds,

either among material for nests or by seeds attached to their feet, as in one case at least the cave is at the end of a narrow gully facing the sea, where seeds could hardly arrive by any other means. It is the only flowering plant in such places, occurring in its common shade form with glabrous pedicels and calyx.

STELLARIA ULIGINOSA, *Murr.*—Rare; roadside ditch between Scarinish and Ballyphetrish.

ARENARIA SERPYLLIFOLIA, *L.*—Very common.

ARENARIA PEPLOIDES, *L.*—Common; occurs principally on sandy shores, but is also found in salt marshes.

SAGINA MARITIMA, *Dow.*—Rare; among rocks on the shore near Loch-na-Gile; near the harbour.

SAGINA PROCUMBENS, *L.*—Common on banks, roadsides, and shores.

SAGINA NODOSA, *Fenzl.*—Sandy places in Hynish and Gott Bays; wet pasture at Hianish. Probably not uncommon.

SPERGULA ARVENSIS, *L.*, var. *sativa* (Bœnn.)—Common in cultivated fields.

BUDA MARINA, *Dum.* (*Spergularia neglecta*, Syme).—Rather common in the salt marshes of the north-east shore.

BUDA MEDIA, *Dum.* (*Spergularia marginata*, Syme).—In the same locality as the preceding, but more common; also, though rare, in Hianish salt marsh.

MONTIA FONTANA, *L.*—Rare; near Loch-na-Gile.

HYPERICUM PULCHRUM, *L.*—Rare; among rocks at Hynish Head and Kenavara.

HYPERICUM ELODES, *L.*—Rare; small lochs at Ruaig; loch on Hynish Hill.

LINUM CATHARTICUM, *L.*—Common on pastures and banks.

GERANIUM SANGUINEUM, *L.*—Rare; on rock ledges, Kenavara; it does not appear to occur on sand dunes as it does in the neighbouring island of Coll.

GERANIUM MOLLE, *L.*—Very common; sand dunes, fields, and roadsides.

GERANIUM DISSECTUM, *L.* — Rather rare; cultivated field and roadside, Scarinish; among rocks at roadside, Ballyphetrish; roadside, Barrapol.

ERODIUM CICUTARIUM, *L'Hérit.*—Not generally common, but abundant in places. Sand dunes, fallow fields, and tops of walls. Usually very glandular in sandy places. A small eglandular form, with calyx-hairs mostly appressed, occurs in a pasture field at Cliad. No plants with spotted petals were seen.

[Ulex europæus, *L.*—On rocky pasture in the Manse field, planted by the Rev. Mr. Campbell, a former parish minister of Tiree. I was told that the present gamekeeper also introduced the plant on an island in one of the lochs.]

Medicago lupulina, *L.*—Locally very common; sandy pastures near Scarinish, where the plant is covered with whitish pubescence. Where growing in loamy soil the plant is green.

Trifolium pratense, *L.*—Common; banks, roadsides, and cultivated fields. Has been sown as a crop with rye grass in Tiree since about 1761 (Dr. John Walker, in "Economic History of the Hebrides," 1812, who also mentions the plant as a native constituent of sandy pasture fields in the Hebrides).

Trifolium medium, *L.*—Rare; side of ditch, Cornaig.

Trifolium repens, *L.*—Very common over almost the whole island.

Trifolium dubium, *Sibth.*—Very common; banks, pastures, and sand dunes; also common in cultivated fields.

Anthyllis Vulneraria, *L.*—Generally common and locally abundant. Var. *maritima*, Koch (*teste* Ar. Bennett), on sand dunes, Hynish Bay, rare; growing with the type and apparently under the same conditions. It is conspicuous by its size and the number of heads on the stems and branches, the lower ones being at some distance from the upper.

Lotus corniculatus, *L.*—Common; the typical form is found about sheltered banks, roadsides, and sides of cultivated fields. The form with more thick and fleshy leaflets occurs among rocks on the shore, as it does over all this part of the coast. It seems to be the var. *crassifolius* of Syme in "English Botany," ed. 3, but I hardly think it is worth varietal rank. Another form, which I have seen only in Tiree, grows sparingly in sandy pasture; it is a small prostrate plant with small leaflets, and with branches spreading in a circle, the base of the stem and branches denuded of leaves for some distance, and with the stems, leaves, and calyx covered with white woolly hairs, giving the plant in its more marked forms a grayish appearance.

Vicia Cracca, *L.*—Rather rare; sand dunes and cultivated fields. On Hynish Bay sands it is somewhat dwarfed, with grayish pubescent leaflets and short racemes.

Vicia sepium, *L.*—Rare; among rocks at Kenavara; also in cultivated fields, where perhaps it is more common.

Lathyrus pratensis, *L.*—Common, plentiful locally; sides of fields, roadsides, tops of walls.

Spiræa Ulmaria, *L.*—Common in the shelter of ditches, walls, rocky places, and roadsides.

Fragaria vesca, *L.*—Rare; among rocks, Hynish Head.

Potentilla sylvestris, *Neck.*—Common, especially on Scarinish Moor.

Potentilla reptans, *L.*—Very rare; sand dunes, Hynish Bay, remote from cultivation. Petioles, both leaf surfaces, upper part of peduncle, and calyx, covered with silky hairs when young, becoming less so when older; but both sides of the leaf remaining hairy over most of the surface.

Potentilla anserina, *L.*—Very common; sides of fields and roads, shingles and sand dunes.

Potentilla palustris, *Scop.*—Very common; marshes, ditches, and sides of lochs.

Alchemilla vulgaris, *L.*—Rare; Kenavara Head; near Loch Vassapol. In both places as the var. *alpestris* (Schmidt).

Rosa pimpinellifolia, *L.*—Very rare; a few stunted, flowerless plants in crevices of rock at Cliad.

Rosa canina, *L.*—Very rare; a few stunted bushes clinging to the face of a rock near Ballyphetrish. Too immature to be determined; leaves glabrous, doubly serrate, flowers light red.

Saxifraga tridactylites, *L.*—Only one plant seen; sandy pasture between Barrapol and Kenavara.

Sedum anglicum, *Huds.*—Common among rocks both on the shore and inland.

Sedum acre, *L.*—Common; sandy shores and on sandbanks inland.

Drosera rotundifolia, *L.*—Rather common, and more generally distributed than the next.

Drosera intermedia, *Hayne.*—Rather rare; Scarinish Moor.

Hippuris vulgaris, *L.*—Locally common; sides of lochs, streams, Fhaodhail. In two localities, Cornaig and Loch Vassapol streams, the plant is submerged in running water, and has longer and softer leaves of very different appearance from the ordinary form. Mr. Bennett thought that a plant from the first locality was a small form of the var. *fluviatilis*, Weber. In the other station, where a nearly similar form occurs, the typical plant grows at the edge of the stream, with submerged intermediate forms varying according to the depth of the water.

Myriophyllum spicatum, *L.*—Locally common; streams at Cornaig, pool on rocky shore near the harbour.

Myriophyllum alterniflorum, *DC.*—Less common, I think, than the former; Loch-na-Gile.

Callitriche stagnalis, *Scop.*—Common; mostly in ditches, also as a very small form in drier places.

Callitriche hamulata, *Kuetz.*—Rare; Loch-na-Gile?

Peplis Portula, *L.*—Rather rare; roadside ditch between Scarinish and Ballyphetrish; near Loch-na-Gile.

Lythrum Salicaria, *L.*—Local; sides of ditches and marshes, Scarinish, Cornaig, etc.

Epilobium parviflorum, *Schreb.*—Rather common; Hynish, etc.

Epilobium montanum, *L.*—Very rare; among rocks, Ben Hoch.

Epilobium palustre, *L.*—Rare; Hynish, ditch on the Hotel farm.

Hydrocotyle vulgaris, *L.*—Very common among grass in damp places in the most exposed parts of the island as well as in more sheltered localities.

Eryngium maritimum, *L.*—Not generally common. West sandy shore in quantity; Hynish and Gott Bay sands, rather scarce.

Conium maculatum, *L.*—A few plants in a rye-grass field belonging to the Hotel.

Apium nodiflorum, *Reichb. fil.* var. *ocreatum*, Bab.—Common; ditches and sides of lochs.

Apium inundatum, *Reichb. fil.*—Common; sides of lochs and ditches, often in deeper water than the former.

Sium erectum, *Huds.*—Locally common; Loch-an-Eilean stream; Fhaodhail.

Conopodium denudatum, *Koch.*—Rare.

Anthriscus sylvestris, *Hoffm.*—Very common about houses, waste places, and sides of cultivated fields; very rarely at any distance from cultivation.

Œnanthe lachenalii, *C. Gmel.*—Common in some marshy places and sides of streams.

Œnanthe crocata, *L.*—Rather common; generally in wet places near the shore. This plant, I believe, not unfrequently causes death by poisoning to cattle on this coast.

Ligusticum scoticum, *L.*—In some quantity on the few rocks and sea cliffs of the island, Kenavara, Cliad, etc.

Angelica sylvestris, *L.*—Rather common about damp sheltered rocks.

Heracleum Sphondylium, *L.*—Common; on ledges of sea cliffs, as well as at sides of cultivated fields.

Daucus Carota, *L.*—Very common; sandy pastures, dunes, fields, and roadsides.

Lonicera Periclymenum, *L.*—Very rare; ledge of rock at Hynish Head.

Galium verum, *L.*—Very common; sandy pastures, dunes, fields, and roadsides.

Galium saxatile, *L.*—Common, but much less so than the preceding.

Galium palustre, *L.*—Common in wet places. Leaves vary from broadly obovate to narrowly lanceolate, the margins always with prickles, which likewise occur on the midrib of at least some of the leaves of each plant. The stem has always some prickles, but only a few are found in the thicker-stemmed, narrow-leaved form of the wetter places.

Galium Aparine, *L.*—Rather common, especially on shingly shores.

Valeriana sambucifolia, *Willd.*—Very rare; among rocks at Hynish Head.

Scabiosa succisa, *L.*

Bellis perennis, *L.*—Very common.

Aster Tripolium, *L.*—Common in the salt marshes of Urvaig and the Fhaodhail.

Antennaria dioica, *R. Br.*—Very common over most of the island.

[Inula helenium, *L.*—Mr. Erskine Beveridge sent me a fresh specimen which had been gathered at Ballyphetrish.]

Achillea Millefolium, *L.*—Very common; pastures, roadsides, and dunes.

Chrysanthemum segetum, *L.*—Locally common in cultivated fields.

Chrysanthemum Leucanthemum, *L.*—Local. Manse field in quantity, Scarinish, Hylipol.

Matricaria inodora, *L.*—The typical inland plant with erect stem and fine leaf segments does not occur in Tiree, the nearest approach to it being in the case of some plants in a rye-grass field at Ruaig, where the stems are almost erect, but the leaf segments are more fleshy. The ordinary maritime form of this coast is common on shingles and about house walls near the sea; the stems ascending, less branched upwards, with thicker peduncles and more fleshy leaves. On sheltered ledges of sea cliffs at Kenavara Head it has leaves still more fleshy, and with the segments shorter. In this last situation the plant

seems to be a perennial with long rootstocks covered with former leaf bases. This apparently perennial character and more fleshy leaf occurring on sheltered ledges of sea cliffs is seen also here with another annual or biennial *Plantago Coronopus*. On the west coast of Inverness-shire the leaves of the *Matricaria* are more fleshy on the shores of the open sea than when growing in estuaries.

Artemisia vulgaris, *L.*—Common; chiefly at sides of cultivated fields and in waste places, more rarely on sand dunes.

Tussilago Farfara, *L.*—Only one patch seen, at the side of a cultivated field at Cornaig.

Petasites officinalis, *Mœnch.*—Local; sides of streams near cottages at Hynish and Cornaig; also at the side of a stream near Cliad remote from houses.

Senecio vulgaris, *L.*—Common; cultivated fields and waste places.

Senecio Jacobæa, *L.*—Very common on roadsides near houses, decreasing in proportion to its distance from them; also occurs at sides of fields and on dunes, very rarely on sea cliffs.

Senecio aquaticus, *Huds.*—Common in wet places.

Arctium minus, *Bernh.*—Common; waste places, roadsides, and sides of fields.

Cnicus lanceolatus, *Willd.*—In similar places to the preceding, but extending farther among pasture fields.

Cnicus palustris, *Willd.*—Rather common, but less so than the former, usually growing in wetter places, but sometimes along with it.

Cnicus arvensis, *Hoffm.*—Very common; fields and sand dunes.

Centaurea nigra, *L.*—Common in pastures.

Crepis virens, *L.*—Local; sides of fields and roadsides.

Hieracium Pilosella, *L.*—Local; Scarinish Moor, etc.; also on sand dunes rarely, as a more hairy plant with shorter stolons. The only member of the genus seen.

Hypochæris radicata, *L.*—Common; fields, banks, and among rocks.

Leontodon autumnalis, *L.*—Common; occurs in two extreme forms,—the small, nearly glabrous plant of salt marshes, and a tall, branched plant on sand dunes, with broad and often hairy leaves, and with the upper part of peduncles and the involucres covered with copious, shaggy, dark green or brown hairs,—intermediate forms occur.

Taraxacum officinale, *Web.*—Common on roadsides and walls, extending to the dunes; a form that occurs, though scarce, on the latter, with brick-red achenes, is under examination.

Var. c. *palustre* (DC.)—Marshy ground on north-east shore, rare.

Var. d. *udum* (Jord.)?—Wet rocky ledges, Kenavara; appears to agree with plants so named. (A similar form is common on this coast among wet rocks.)

Sonchus asper, *Hoffm.*—Common; sides of fields and waste places.

Lobelia Dortmanna, *L.*—Rather common in the more peaty lochs.

Campanula rotundifolia, *L.*—Locally common; Kenavara, Ballyphetrish, etc.

Vaccinium Myrtillus, *L.*—Apparently rare.

Calluna Erica, *DC.*; Erica Tetralix, *L.*; E. cinerea, *L.*—All the heaths must be classed among the "common" plants of Tiree, the first especially so; but being always prostrate, and not more than two to three inches in height, they are inconspicuous—so much so that the general visitor might think that they are not to be found on the island. The *Calluna* is much the most common, and is not confined to the central moorish ground as the others appear to be.

Armeria maritima, *Willd.*—Very common; shore rocks, salt marshes, and sand dunes.

Primula acaulis, *L.*—Locally common; Kenavara, Cliad, Salum.

Lysimachia nemorum, *L.*—Rare.

Glaux maritima, *L.*—Common in salt marshes and on muddy shores, more rarely in sandy places.

Anagallis tenella, *L.*—A very common and characteristic plant of Tiree.

Centunculus minimus, *L.*—Only seen on a wet bank on the shore at Rudh-an-Sgoir Mhoir.

Samolus Valerandi, *L.*—Common in several places; Fhaodhail, Loch-na-Mointeich, etc.

Erythræa Centaurium, *Pers.*—Rather common; Barrapol, etc.

Var. *capitata*, Koch (*teste* Ar. Bennett).—Hynish Bay sands, Kenavara Head.

Gentiana campestris, *L.*—Rare?; seen only near Scarinish.

Menyanthes trifoliata, *L.*—Common, but not generally in quantity.

Lycopsis arvensis, *L.*—Common at the sides of sandy cultivated fields and on roadsides near cottages, but nowhere with the appearance of being native.

Pneumaria (Mertensia) maritima, *Hill.*—A fresh specimen was given to me, gathered by Mr. Erskine Beveridge in Salum Bay.

Myosotis cæspitosa, *F. Schultz.*—Common in wet places; more generally distributed than the next.

Myosotis repens, *G. Don.*—Common in wet places.

Myosotis arvensis, *Lam.*—Common; cultivated fields, roadsides, and banks.

Myosotis versicolor, *Reichb.*—Common in similar places as the preceding.

Volvulus Soldanella, *Junger.*—Rare. Fresh specimens from the Hynish Bay sands were sent to me by the Rev. D. Maclean.

[Veronica Tournefortii, *C. Gmel.*—A few plants were found about the Hotel grounds. If this be its only station it cannot yet be considered as permanently established.]

Veronica arvensis, *L.*—Very common on dry banks.

Veronica serpyllifolia, *L.*—Rare.

Veronica officinalis, *L.*—Rather rare; Scarinish Moor and roadside.

Veronica Chamædrys, *L.*—Rare; roadside, Scarinish.

Veronica scutellata, *L.*—Rare; Loch-na-Mointeich and neighbouring wet places.

Veronica Anagallis-aquatica, *L.*—Common in ditches. All the specimens examined had the inflorescence glandular.

Veronica Beccabunga, *L.*—Very rare; a few plants in the roadside ditch between Scarinish and the Manse.

Euphrasia officinalis, *L.*—Common as *E. borealis*, Towns., in grassy pastures, and as *E. gracilis*, Fr., in peaty soil.

Bartsia Odontites, *Huds.*—Common in many fields as the var. *verna* (Reichb.).

Var. *serotina* (Reichb.)?—Ballyphetrish; specimens immature but probably of this variety.

Pedicularis palustris, *L.*—Common on the wetter parts of Scarinish Moor, etc.

Pedicularis sylvatica, *L.*—Common on moorish ground.

Rhinanthus Crista-galli, *L.*—Very common at sides of fields; also occurs in dry places as a smaller, narrow-leaved form.

Utricularia minor, *L.*—Very rare; ditch near the loch on Hynish Hill.

Utricularia intermedia, *Hayne.*—Local; lochs on Scarinish Moor, etc.

Pinguicula vulgaris, *L.*—Rather common in turfy places.

Pinguicula lusitanica, *L.*—Rather rare; Scarinish Moor; near loch on Hynish Hill.

(Mentha, *sps.*—The mints were not in flower during my visits; one species is very common in wet places.)

Thymus Serpyllum, *Fr.*—Common.

Thymus Chamædrys, *Fr.*—Also common, but less so than the former.

Prunella vulgaris, *L.*—Rather common, but not to the usual extent, on this coast. Is mostly found on damp roadsides.

Stachys palustris, *L.*—Rare; Ruaig.

Stachys sylvatica, *L.*—Rare; Ballyphetrish, Hynish, Kenavara.

Lamium intermedium, *Fr.*—Common in some cultivated fields.

Lamium purpureum, *L.*—Rare; about houses at the harbour.

Plantago major, *L.*—Common.

Plantago lanceolata, *L.*—Very common; fields, dunes, etc.

Plantago maritima, *L.*—Very common on shore rocks and sea cliffs.

Plantago Coronopus, *L.*—Very common on the shore.

Var. *maritima*, Gren. and Godr. (*teste* Ar. Bennett).—On rocky ledges of sea cliffs, Kenavara, rare. A well-marked plant with large, broad, nearly erect, very fleshy leaves, and with usually erect peduncles. In the "Journal of Botany," 1897, p. 257, there is an article on the forms of the species, with the distribution of this variety given as from France, South Spain, Berlengas. The Tiree locality is an interesting addition to the above.

Littorella juncea, *Berg.*—Common at the shallow sides of some lochs; Loch-na-Gile, etc.

Chenopodium album, *L.*

Atriplex patula, *L.*, var. *salina.*—Common in salt marshes between Urvaig and Salum.

Atriplex Babingtonii, *Woods.*—Common on sandy shores and salt marshes.

Atriplex laciniata, *L.*—Common on some sandy shores; Salum Bay, etc.

Salicornia herbacea, *L.*—Very rare; only seen on Hianish salt marsh.

Suæda maritima, *Dum.*—In some quantity on the muddy shore between Urvaig and Salum.

Salsola Kali, *L.*—Locally common on sandy shores and dunes; Traigh-na-Gillean, Traigh Sorobaith, Salum Bay.

Polygonum aviculare, *L.*—Common as the erect plant with oval subacute leaves; cultivated fields, occasionally on roadsides.

Polygonum Raii, *Bab.*—Rather rare; sandy shore, Salum Bay.

Polygonum Persicaria, *L.*—Very little seen; Ruaig.

Polygonum amphibium, *L.*—The floating form is rare, and seems confined to Loch Vassapol and its exit stream. The land form occurs in great abundance in fields and on roadsides over most of the island.

Rumex obtusifolius, *L.*—Common; sides of cultivated fields, waste places, and roadsides.

Rumex crispus, *L.*—Common; roadsides, cultivated fields, dunes, and shores.

Rumex Acetosa, *L.*—Very common; cultivated fields, roadsides, etc.

Rumex Acetosella, *L.*

Euphorbia Helioscopia, *L.*—Local; cultivated fields, Cornaig.

Urtica dioica, *L.*—Common in waste places.

Urtica urens, *L.*—Rare; cultivated field, Cornaig.

Myrica Gale, *L.*—Local, and not in any quantity; Scarinish Moor, etc.

Salix repens, *L.*—Very common, except on the dunes.

Orchis incarnata, *L.*—Common in pastures. Might almost be given as "very common," which is unusual for the species on this coast.

Orchis latifolia, *L.*—Rather rare, though widely distributed; Barrapol, Fhaodhail, etc.

Orchis maculata, *L.*—Very common; occurs with the two preceding species in damp pastures, and extends by itself on to moorish ground.

Habenaria viridis, *R. Br.*—Rather rare. On dry grassy banks at Scarinish and its moor; Manse field; near Loch Vassapol.

Habenaria chloroleuca, *Ridley.*—Very rare; Kenavara.

Iris Pseudacorus, *L.*—Very common.

Allium ursinum, *L.*—Rare; among sheltered rocks at Kenavara Head.

Scilla verna, *Huds.*—Very rare; a few plants on rocky ledges, Kenavara Head.

Scilla festalis, *Salisb.* (*S. nutans*, Sm.)—Rather common among rocks, Kenavara Head.

Narthecium ossifragum, *Huds.*—Common on moorish ground.

Juncus bufonius, *L.*—Common in wet sandy places and roadsides; also, but sparingly, on drier sandy pastures.

Juncus squarrosus, *L.*—Common on Scarinish Moor; occasionally on roadsides.

Juncus Gerardi, *Loisel.*—Very common in salt marshes.

Juncus effusus, *L.*, and J. conglomeratus, *L.*—Neither of these rushes is as common as in most places. They are chiefly confined to roadsides.

Juncus supinus, *Mœnch.*—Very common. All the land specimens which were examined had six stamens, with the filaments varying in length relative to the anthers. It is very rarely that one finds the land form having only three stamens on this coast. Two plants of the submerged form which were found in flower had three stamens.

Juncus lampocarpus, *Ehrh.*—Common.

Juncus acutiflorus, *Ehrh.*—More common than the former, I think.

Luzula campestris, *DC.*—The Rev. D. Maclean sent me fresh specimens in spring, with the remark that the plant was then "quite common." I saw one plant in July.

Luzula erecta, *Desv.*—Rather common.

Sparganium ramosum, *Huds.* — Rare. Ditch, Cornaig; Loch Vassapol.

Sparganium minimum, *Fr.*?—Rare; stream, Hynish Bay; specimens immature.

Lemna minor, *L.*—Very rare; ditch on the shore, Urvaig.

Alisma Plantago-aquatica, *L.*, var. *lanceolatum*, Afz. (*teste* Ar. Bennett).—Rare; ditch, Cornaig.

Alisma ranunculoides, *L.*—Common; sides of lochs, marshy places, and ditches.

Triglochin palustre, *L.*—Common; Loch-na-Mointeich, etc.

Triglochin maritimum, *L.*—Common in salt marshes and on muddy shores.

Potamogeton polygonifolius, *Pour.*—Common on the marshy sides and in shallower parts of lochs.

Potamogeton heterophyllus, *Schreb.*—Loch Vassapol.

Potamogeton nitens, *Web.*—Loch Vassapol.

Potamogeton perfoliatus, *L.*—Loch Vassapol and its exit stream.

Potamogeton pusillus, *L.*—Locally common; Loch Vassapol, Cornaig, Fhaodhail.

Potamogeton pectinatus, *L.*—Loch Vassapol and its exit stream in plenty.

Potamogeton filiformis, *Nolte.*—Fhaodhail in some quantity; Cornaig stream.

Ruppia rostellata, *Koch.*—Fhaodhail; pool on shore near Loch-na-Gile.

Zostera marina, *L.*—Cast up on the shore.

Eleocharis palustris, *R. Br.*—Common; abundant in places. Occurs as a small form on the sandy shore of Loch Vassapol, and is often dwarfed, 4 to 6 inches in height, when in places liable to inundation.

Eleocharis uniglumis, *Reichb.*—Rather common. Shore near Loch-na-Gile; Fhaodhail in plenty; Hynish; also dwarfed, 2 to 4 inches, on the sandy shore of Loch Vassapol.

Eleocharis multicaulis, *Sm.*—Common; Scarinish Moor, etc.

Scirpus pauciflorus, *Lightf.*—Very common; Fhaodhail, etc.; also in a smaller form in turfy roadsides.

Scirpus cæspitosus, *L.*—Very little seen; Scarinish Moor, where it is nearly prostrate, the stems being curved to the ground.

Scirpus fluitans, *L.*—Common in the smaller lochs and in some ditches in moorish ground.

Scirpus setaceus, *L.*—Rather rare, but widely spread; wet places on the shore, Scarinish Moor, etc.

Scirpus Tabernæmontani, *Gmel.*—Rare; Loch Vassapol, pool at shore near Loch-na-Gile.

Scirpus maritimus, *L.*—Common in pools and wet places about the north-east shore as the compact form with at times only one sessile spike.

Scirpus rufus, *Schrad.*—In great quantity on the Fhaodhail; salt marsh between Urvaig and Salum, common.

Eriophorum angustifolium, *Roth.*—Generally distributed in wet turfy places.

Schœnus nigricans, *L.*—Very common on the moor in the centre of the island, where, with the rest of the vegetation, it is usually dwarfed; also occurs at Hynish.

Carex dioica, *L.*—Rare; Scarinish Moor.

Carex pulicaris, *L.*—Rather common; Scarinish Moor, Ruaig, etc.

Carex disticha, *Huds.*—Very rare; near the road, and in the old reservoir, Hynish, the localities being about 200 yards apart.

Carex arenaria, *L.*—Very common above the sandy shores, and on dunes.

Carex paniculata, *L.*—Very rare; one large patch at the upper end of Loch Vassapol.

Carex vulpina, *L.*—Rare; Hynish Head, Fhaodhail, Ballyphetrish at the side of a grass field. This last locality is an unusual one for this coast, as the plant is generally limited to wet rocky places on the shore.

Carex echinata, *Murr.*—Common.

Carex ovalis, *Good.*—Rather common; principally on roadsides and sides of fields.

Carex Goodenovii, *J. Gay.*—Common.
Var. *juncella* (T. M. Fries).—Hynish, Loch-na-Gile.

Carex flacca, *Schreb.* (*C. glauca.*, Murr.)—Common, especially about the shores.

Carex pilulifera, *L.*—Rare; Barrapol.

Carex panicea, *L.*—Locally common; a slender, small-fruited plant occurs at the side of a loch on Scarinish Moor. At Loch-na-Mointeich, where the ordinary plant is common, a form occurs with the stalk of the male spike geniculate, as may occasionally be seen with *C. vaginata*, Tausch, in alpine situations.

Carex binervis, *Sm.*—Rare.

Carex distans, *L.*—Rare; shore near Loch-na-Gile as a slender form.

Carex fulva, *Good.*—Local; Barrapol; fairly plentiful on Scarinish Moor; Loch-na-Mointeich.

Carex extensa, *Good.*—Seen only at the Fhaodhail, where it is plentiful.

Carex flava, *L.*—Rather common.
Var. *cyperoides*, Marsson.—Common, and frequently abundant in wet places.

Carex flava × fulva.—Loch-na-Mointeich, with both parents.

Carex hirta, *L.*—Rare; only a few plants at each locality; roadsides, Barrapol and Scarinish; field behind the Hotel.

Carex rostrata, *Stokes.*—Locally common in ditches and marshes.

Anthoxanthum odoratum, *L.*—Very common.

Alopecurus geniculatus, *L.*—Common in ditches by roadsides.

Agrostis canina, *L.*—Common; the awnless form was also seen.

Agrostis palustris, *Huds.* (*A. alba*, L.)—Common, occasionally with awns.

Var. *maritima*, Mey.—On sand dunes.

Agrostis vulgaris, *With.*—Common.

Ammophila arundinacea, *Host.*—Abundant, occupying large tracts on the dunes.

Aira præcox, *L.*—Very common; dry banks, etc.; sometimes on dunes.

Deschampsia cæspitosa, *Beauv.*—Rather common; Barrapol, Ballyphetrish, etc.

Deschampsia discolor, *Roem.* and *Schult.*—Rare; near Loch-na-Gile.

Deschampsia flexuosa, *Trin.*

Holcus lanatus, *L.*—Common; chiefly by sides of fields and by roadsides.

Avena pubescens, *Huds.*—Rare; among rocks at Cliad, and at Ballyphetrish.

Arrhenatherum avenaceum. *Beauv.*—Local; usually at sides of fields, and among rocks by roadsides, as at Hynish and Ballyphetrish.

Sieglingia decumbens, *Bernh.*—Common; Scarinish Moor, etc.

Phragmites communis, *Trin.*—Common; locally plentiful; streams and marshy places, extending among pastures.

Cynosurus cristatus, *L.*—Common.

Kœleria cristata, *Pers.*—Very common; sandy and rocky pastures, and dunes.

Molinia varia, *Schrank.*—Common in turfy places.

Catabrosa aquatica, *Beauv.*—Local, usually at the exit of streams on sandy shores. It is found only as the small decumbent form with one- or two-flowered spikelets—the latter being, I think, the more numerous.

Dactylis glomerata, *L.*—Rather common; fields and roadsides.

Poa annua, *L.*—Very common in general; rare on the moorish ground, rather common on dunes.

Poa pratensis, *L.*—Common.

Poa trivialis, *L.*—Rather rare; mostly by roadsides and sides of fields.

Glyceria fluitans, *R. Br.*—Common in ditches. Panicle sometimes simple and spike-like.

Glyceria maritima, *Mert.* and *Koch.*—Common on the salt marsh and muddy shore between Urvaig and Salum. A larger and more erect form occurs with rachis and panicle branches rough. This roughness of the panicle is not uncommon on this coast, and varies greatly in amount.

Festuca rottbœllioides, *Kunth.*—Locally common in sandy places; Scarinish, Urvaig, Cliad.

Festuca ovina, *L.*—Common.
Var. *capillata*, Hackel.—Ballyphetrish.

Festuca rubra, *L.*—Very common on sandy pastures and dunes. A tall, large-flowered form also occurs on dunes with *Ammophila*.
Var. *pruinosa*, Hackel.—Rocky shores and sea cliffs.

Festuca elatior, *L.*—Rare; Cornaig.

Bromus mollis, *L.*—Common by roadsides and fields.

Lolium perenne, *L.*—Very common on sandy and cultivated ground and roadsides.

Agropyron repens, *Beauv.*—Very rare; only a few plants seen on the shore, at the side of a cultivated field. They probably had been weeded out of the field, as they had not the appearance of shore forms.

Agropyron junceum, *Beauv.*—Very common on sandy shores and dunes. On this coast a form occurs with leaves which are flat in the fresh state, remaining to a considerable extent flattened out under pressure when dried. I had hitherto taken this form to be the *Triticum acutum* of Syme's "English Botany"; and I think this was the opinion, to some extent, of those botanists to whom I had submitted specimens. I have lately sent to Professor Hackel a series of specimens of this form. He considers that they are true *junceum*, and adds: "The true *A. acutum* (*Triticum acutum*, DC. !) is a hybrid between *T. littorale*, Host (which does not grow on the northern shores of Europe) and *T. junceum*. What North European botanists call *A. acutum* are mostly hybrids between *A. repens* and *junceum*, but there seem to exist also distinct forms of not hybrid origin. The question is somewhat entangled and requires field observation, which I cannot procure." A plant from the sandy shore of Eigg, growing with *A. junceum* and *repens*, Professor Hackel thinks may be the hybrid. This recognition of hybridity ought at least to assist in clearing up the difficulties with regard to these shore forms.

Nardus stricta, *L.*—Common in turfy places.

Pteris aquilina, *L.*—In local patches, but not generally spread.

Asplenium Adiantum-nigrum, *L.*—Rare; Ballyphetrish or Hynish.

Asplenium marinum, *L.*—Common among sea cliffs at the south of the island.

Asplenium Trichomanes, *L.*—Rare; among rocks at Ballyphetrish.

Athyrium Filix-fœmina, *Roth.*—Rare, though occurring in several places: Hynish, Scarinish, etc.

Lastræa Filix-mas, *Presl.*—Rather rare; Urvaig, Salum, Hynish, etc.

Lastræa dilatata, *Presl.*—Very rare; Hynish Head.

Polypodium vulgare, *L.*—Locally common; Salum, Hynish Head, etc.

Botrychium Lunaria, *Sw.*—Very little seen; rocky bank on Scarinish Moor; bank at roadside between Scarinish and Ballyphetrish.

Equisetum arvense, *L.*—Very common.

Var. *serotinum*, Mey. (*teste* Ar. Bennett).—Field belonging to the Hotel, Scarinish. This form appears to be rare in Europe. Mr. Bennett thinks that it has been recorded once before from Britain.

Equisetum palustre, *L.*—Very common.

Var. *nudum*, Newn.—On the sandy shore of Loch Vassapol.

Equisetum limosum, *Sm.*—Common.

Selaginella selaginoides, *Gray.*—Rare; Scarinish Moor, near Loch-na-Gile.

Chara fragilis, *Desv.*—Common in the lochs on Scarinish Moor.

Var. *delicatula*, Braun.—Loch-na-Gile and neighbourhood.

Chara aspera, *Willd.*—Common, and locally abundant; Loch Vassapol, Fhaodhail, Scarinish Moor, etc.

Chara contraria, *Kuetz.*—Loch Vassapol.

Chara hispida, *L.*—Rather rare; Loch-na-Mointeich, lochs on Scarinish Moor.

Chara vulgaris, *L.*—Abundant in Loch Vassapol, its exit stream, and ditches by the side of the loch.

Var. *papillata*, Wallr.—Ditches at Loch Vassapol.

Nitella translucens, *Agardh.*—Rare; Loch-na-Gile.

Nitella opaca, *Agardh.*—Rare; Loch-na-Gile, reservoir at Hynish

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S.

(*Continued from p.* 46.)

[I have to thank Mr. James M'Andrew and Mr. A. Somerville for additional information regarding the flora of S.W. and W. Scotland. Such of it as relates to the species included in this journal in January will find a place in supplementary notes at the close of this list, along with all other information that I obtain from any source too late for its incorporation in the list itself. All botanists able to favour me with information additional to these or previous records, or to correct any errors into which I may have fallen, will confer a favour by communicating the same to me.—J. W. H. T.]

[Names of plants in *italics*, except as synonyms within curved brackets, denote that the plants were *certainly* introduced into Scotland by man. † after a district number denotes introduction by man into the district; "cas." denotes casual occurrence, and "esc." evident escape or outcast from cultivation, both being due to man's agency. Square brackets enclosing the name of a plant or a district number denote that the record was made in error. ? after a district number denotes, at least, need of confirmation; after † it denotes doubt as to whether the plant owes its presence in the district to man.]

Cruciferæ (*contd.*)

Diplotaxis tenuifolia, *DC.*, 75†, 77 (?), 81 (?), 85 (?), 86†, 87 cas.
D. muralis, *DC.*, 75 (?), 80, 85†, 86 (?), 87 cas.
Bursa pastoris, *Weber* (*Capsella Bursa-pastoris*, Mœnch), all.
Coronopus didymus, *Sm.* (*Senebiera didyma*, Pers.), 75, 85, 87†, 106†.
C. Ruellii, *All.* (*S. Coronopus*, Poir.), 73, 74, 75, 80-83, 85, 87†, 88†, 92† 93†, 94, 95†, 100, 105, 106 (?).
Lepidium latifolium, *L.*, 77†, 80†, 81†, 82†, 85,† 107†.
L. ruderale, *L.*, 73, 74 cas., 80 cas., 83, 85†, 86†, 87†, 88†.
L. sativum, L., casual here and there.
L. campestre, *R. Br.*, 72-75, 77, 81-91, 96†. Dr. White states that "perhaps *L. campestre* should be regarded rather as often a colonist than as a native in Perthshire."
L. hirtum, *Sm.* (*L. Smithii*, Hook.), *except 78, 95, 101, 102, 104, 107, 108, 109, 110, 111, 112.*
b. canescens, *Gren.* and *Godr.*, 87-89.

[1] *L. Draba*, L., casual, *e.g.* in 72, 75, 77, 89, and 92.
Thlaspi arvense, *L.*, a weed of cultivation in all *except 76, 97, 98, 99, 101, 102, 103, 104, 105, 108, 110, 112.*
Th. alpestre, *L.*, 88, 89, 90.
a. sylvestre (Jord.), 90.
Iberis amara, L., casual in 72, 73, 77, 79-81, 83-85, 87-89, 92.
Teesdalia nudicaulis, *R. Br.*, 72-75, 77-81, 83, 85, 88-93, 95, 96, 99, 106.
Hutchinsia petræa, *R. Br.*, 72 (?).
Isatis tinctoria, L., 74 cas.
Crambe maritima, *L.*, 73-75, 81, 84, 85, 100, 101, 102.
Cakile maritima, *Scop.*, *except 76, 77, 78, 79, 80, 84, 88, 89, 98, 99, 104, 105, 107.*
b. integrifolia, *Koch*, 110.
Raphanus Raphanistrum, *L.*, all.
R. maritimus, *Sm.*, 73-76, 98-101, 104, 110, 112 (?).

Resedaceæ.

Reseda lutea, L., casual, *e.g.* in 92.
[2] R. Luteola, *L.*, 72, 73, 75-77, 79-90, 91†, 92†, 94-96, 101, 106, 109, 112 (?).
R. odorata, L., casual here and there, *e.g.* in 92.

Cistineæ.

Helianthemum Chamæcistus, *Mill.*, *except 76, 84, 98, 99, 101, 102, 103, 104, 105, 108, 109, 110, 111, 112.*

Violaceæ.

Viola palustris, *L.*, all.
V. odorata, *L.*, 72†, 73†, 75, 77†, 80†, 81†, 82†, 83†, 85†, 86†, 87†, 88†, 89†, 90†, 99† (*var.* alba).
[3] V. hirta, *L.*, [72], 73, 80-83, 85, 88-91.
V. Riviniana, *Reichb.* (*V. sylvatica*, Fr.), all.
V. ericetorum, *Schrader* (*V. canina*, L.), *except 72, 74, 75, 79, 80, 81, 93, 95, 97, 99, 101, 103, 104, 105, 107, 110, 111.*
V. lactea, *Sm.*, 78 (?).
V. tricolor, *L.*, all.

[1] *L. Draba*, L.—I have found a plant of this species spread very freely by means of buds produced on roots creeping near, or a few inches below, the surface of the soil. The same plant has showed several very curious abnormalities in the structure of its flowers.

[2] *Reseda Luteola*, L.—This plant is scarcely more than a casual in 91 and 92. Its claims to be regarded as indigenous in so many districts of Scotland appear at least questionable.

[3] *Viola hirta*, L., is given as "frequent" in 72 in "Top. Bot.," but is not noted from the county in Scott-Elliott's "Flora of Dumfries."

V. arvensis, *Murr.*, a weed of cultivation in probably all, though not actually on record from some.
V. Curtisii, *Forster*, 72, 75, 92, 93 (?), 97, 98, 100, 103, 108, 109, 110.
V. lutea, *Huds.*, *except 91, 93, 95, 98, 103, 105, 107, 108, 111, 112.*
f. amœna (*Syme*), 72, 73, 86, 92, 107, 108.
Viola cornuta, L., occurs not unfrequently as a casual on rubbish-heaps and waste ground.

Polygalaceæ.

Polygala vulgaris, *L.*, *except 75, 78, 79, 80, 81, 82, 83, 84, 85, 91, 93, 94, 98, 99, 101, 104, 111.*
P. oxyptera, *Reichb.*, 73, 74, 86, 87-90, 106.
P. serpyllacea, *Weihe*, *except 75, 76, 77, 79, 80, 82, 84.*
P. calcarea, *F. Schultz*, 108.

Caryophyllaceæ.

Dianthus Armeria, *L.*, 72-74, 80 (?), 83†, 89 (exterminated a few years ago by agriculture), 90.
D. deltoides, *L.*, 74†, 75, 77, 80-85, 87-91, 95 (?), 96, 101 (?), 106 (?), 112 (?).
b. glaucus (*L.*), 83.
(D. prolifer, *L.*, is said in Hooker's "Student's Flora" to occur in "gravelly pastures from Perth southwards.")
Saponaria Vaccaria, L., casual, *e.g.* in 72, 92.
S. officinalis, L., casual or introduced in many districts, *e.g.* 74, 92.
Silene Cucubalus, *Wibel*, *except 97, 98, 101, 103, 108, 110*† (?), *111* (?), *112.*
b. puberula, *Syme*, occasionally met with.
S. maritima, *With.*, *except 79, 80, 86.*
S. conica, *L.*, 82, 90, 95†.
S. anglica, *L.*, 75, 80†, 82†, 83, 85, 86†, 88 (?), 90, 92 cas., 95†, 96.
S. dichotoma, Ehrh., casual in 92, 95.
S. acaulis, *L.*, 86-90, 92, 94, 96-99, 103-105, 107, 108, 110-112.
S. nutans, *L.*, 85, 90, 91.
S. italica, Pers., 83†.
S. noctiflora, *L.*, 72 cas., 80, 81 (?), 82, 83 (?), 85, 86, 87† (?), 90.
Lychnis alba, *Mill.*, *except 80, 84, 98, 100, 101, 103, 104, 107, 109, 111, 112.*
L. dioica, *L.*, all.
L. Flos-cuculi, *L.*, all.
L. Viscaria, *L.*, 72 cas., 73 cas., 80, 83, 85-90, 106 (?).
L. alpina, *L.*, 90.

L. Githago, *Scop.*, a weed of cultivation in all *except 78, 79, 97, 98, 107, 108, 110, 112.*

Cerastium tetrandrum, *Curtis*, *except 72, 78, 79, 84, 93, 98, 103, 104.*

C. pumilum, *Curtis*, 85 (??).

C. semidecandrum, *L.*, *except 78, 79, 84, 98, 99, 101, 102, 103, 104, 105, 108, 109, 110, 111* (?), *112* (?).

C. glomeratum, *Thuill.*, all.

b. apetalum, *Dum.*, 89.

C. triviale, *Link.*, all.

b. holosteoides, *Fr.*, 88, 89.

c. pentandrum, *Syme*, 73.

d. alpinum, *Mert.* and *Koch*, 90, 96, 112.

e. longirostre (*Wichura*), 112.

C. alpinum, *L.*, 72, 86-90, 92, 94, 96-99, 104, 106-108.

b. pubescens, *Syme*, 88, 104.

C. arcticum, *Lange*, 88, 94, 97, 98, 108.

b. Edmonstonii, *Beeby*, 112.

C. arvense, *L.*, 72-74, 77, 79-82, 85-94, 95†, 96.

C. trigynum, *Vill.*, 88, 92, 94, 96, 97, 107.

Stellaria aquatica, *Scop.*, [77], 80 (?), 86, [90], [111].

S. nemorum, *L.*, 72, 73, 75-77, 79-81, 83, 85 (?), 86-92, 94-96, 99.

S. media, *Cyr.*, all.

b. Boræana (*Jord.*)

c. major, *Koch.*

S. umbrosa, *Opiz*, 85, 88, 89, 108.

S. Holostea, *L.*, *except 104, 110, 112.*

S. palustris, *Ehrh.*, 72, 73, 74 (?), 76, 77, 80, 81, 82 (?), 83, 85-88.

S. graminea, *L.*, *except 102, 110.*

S. uliginosa, *Murr.*, *except 84.*

Arenaria verna, *L.*, 72, 73, 77 (?), 81, 83, 88, 89, 90 (?), 92, 93, 112.

A. sulcata, *Schlecht.*, 88, 89, 108, 112.

A. tenuifolia, *L.*, [83], [85].

A. trinervia, *L.*, *except 78, 101, 102, 103, 104, 105, 108, 110, 111, 112.*

A. serpyllifolia, *L.*, *except 104.*

b. glutinosa, *Koch*, the commoner form.

c. leptoclados (*Guss.*), 74.

A. norvegica, *Gunn.*, 108, 111 (?), 112.

A. peploides, *L.*, *except 77, 78, 79, 80, 86, 88, 89.*

var. diffusa, 112.

A. sedoides, *Schultz*, 88, 90, 97, 98, 104, 105, 108, 112 (?).

Sagina maritima, *Don*, *except 77, 78, 79, 80, 81, 88, 97* (?), *98, 107.*

c. densa (*Jord.*), 74.

d. alpina, *Syme*, 97.

S. apetala, *L.*, 73, 74, 81, 82, 86, 87, 89, 97, 99, 102, 109, 110, 112.
S. ciliata, *Fr.*, 77 (?), 80-83, 85-89, 91, 92, 94.
S. procumbens, *L.*, all.
S. Boydii, *F. B. White*, 92.
S. Linnæi, *Presl*, [75], 88-90, 92, 96-98, 106, 108, [111], 112.
S. nivalis, *Fr.*, 88, 90 (?), 98 (?) or 99 (?), 104 (?).
S. subulata, *Presl*, *except 78, 79, 80, 82, 105, 106, 107, 109, 111.*
var. glabrata, 112.
S. nodosa, *Fenzl*, *except 78, 84, 107.*
[1] Spergula arvensis, *L.*, in all, as a weed of cultivation.
a. vulgaris (*Bœnn.*), 74, Perthshire "in several places," 91, 92.
b. sativa (*Bœnn.*), 74, 87-93, 96, 98, 110, 111.
[2] Buda rubra, *Dum.* (*Spergularia rubra*, Pers.), *except 79, 97, 101, 103, 104, 107, 108, 109, 110, 112.*
B. marina, *Dum.* (*S. salina*, Presl.), *except 77, 78, 79, 80, 84, 86, 88, 97, 103, 105, 107, 109, 110.*
a. genuinum, 72-74.
b. medium (*Fr.*)
c. neglecta (*Kindb.*), 74, 81, 85-87, 89-92, 97, 98, 102, 104, 105, 108-111.
B. media, *Dum.* (*S. media*, Pers., *L. marginatum*, Koch), 72-76, 85, 90, 91, 93, 97-100, 103-108, 110-112.
B. rupestris (*S. rupestris*, Lebel), 73-75, 93, 101, 110.

Portulaceæ.

C. perfoliata, Donn, and *C. sibirica*, L., have been found as escapes, more or less established in Perthshire, and also in other districts, *e.g. C. sibirica* in 73, 93, 94, and *C. perfoliata* in 91 and 92.

Montia fontana, *L.*, *except 79, 82, 84.* No doubt this occurs in every district. Both the forms *repens*, Pers. (*minor*, Gmel.), and *erecta*, Pers. (*major*, Gmel.), occur wherever I have observed this species in suitable situations.

Elatinaceæ.

Elatine hexandra, *DC.*, 86, 87, 89, 91, 92, 100, 110.

[1] *Spergula arvensis*, L.—The variety *sativa* appears to be that generally distributed in Scotland. I have met with *vulgaris* rarely (and only of late years), usually as an evidently recent introduction.

[2] *Buda*, Adans.—This is the genus variously given in British Floras, and in earlier editions of the "London Catalogue," as *Spergularia*, Persoon, and *Lepigonum*, Fries.

Hypericaceæ.

Hypericum Androsæmum, *L.*, 73-76, 80, 81†, 83†, 85†, 86, 87†, 97-105, 106 (?).

H. calycinum, L., introduced as an ornamental plant here and there, 89.

H. perforatum, *L.*, *except 95, 97, 102, 103, 104, 108, 110, 111* (?), *112*.

H. dubium, *Leers*, 72-79, 81, 85 (?), 86-89, 98, 100, 109.

H. quadratum, *Stokes*, most of the records for "H. quadrangulum, *L.*" (all districts *except 78, 84, 105, 107, 108, 109, 110, 111, 112*) probably belong to this form.

H. humifusum, *L.*, *except 78, 82, 84, 96, 98, 105, 106, 107, 108, 110, 111, 112*.

H. pulchrum, *L.*, all.

b. procumbens, *Rostrup*, 112.

H. hirsutum, *L.*, *except 74* (?), *84, 96, 97, 98, 101, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112*.

H. montanum, *L.*, 75, 98, 106.

H. elodes, *L.*, 73-75, 98-100, 102, 103, 110, 111 (?).

Malvaceæ.[1]

Althæa officinalis, *L.*, 72†, 73†, 86 (?), 99 (?), 100†.

Lavatera arborea, *L.*, 74†, 75, 82†; 85†, 94 cas., 100†.

Malva moschata, *L.*, 72-75, 77, 80-83, 85-89, 90†, 92†, 94, 95†, 96†, 99, 100, 102, 107†, 109†.

M. sylvestris, *L.*, 72, 73, 74, 75-77, 80-86, 87†, 88†, 89†, 90, 91†, 92†, 93†, 94†, 95† (?), 96† (?), 99, 100, 102, 106.

M. rotundifolia, *L.*, 72†, 74† (?), 75, 77, 80-83, 85, 86, 87†, 89†, 90, 91†, 92†, 93†, 95†, 106†.

M. borealis, Wallm., casual in various districts, *e.g.* in 72, Perthshire, 92.

Tiliaceæ.

Tilia, *L.*, no species of this genus can be regarded as indigenous in Scotland, though all the three included in the "London Catalogue" may be met with; the trees are, in almost all cases, more or less evidently introduced by man.

[1] Malvaceæ.—The claims of the species of this order to be indigenous in Scotland are not free from suspicion. Their beauty, and the reputed medicinal value of some, have rendered them favourites in cultivation; and the localities in which they occur are often evidences of their introduction by man. The mark † should be more freely employed in this order.

Linaceæ.

[1] Radiola linoides, *Roth* (*R. Millegrana*, Sm.), *except 77, 78, 79, 82, 83, 84, 97, 104, 107, 110.*

Linum catharticum, *L.*, all.

L. perenne, *L.*, 72 cas., 73 cas., 83 (??).

L. angustifolium, Huds., 73 cas.

L. usitatissimum, L., a relic or weed of cultivation, and casual on rubbish heaps in many districts.

Geraniaceæ.

Geranium sanguineum, *L.*, *except 72, 76, 77, 78, 79, 84, 87, 94, 97, 98, 99, 101, 104, 105, 107, 108, 110, 111, 112.*
d. micranthum, *F. B. White*, 88.

G. striatum, L., a rare escape or casual, 92.

G. phæum, L., escape or outcast in 72-76, 91.

G. sylvaticum, *L.*, *except 74, 101, 103, 104, 107, 110, 112.*

G. pratense, *L.*, *except 84, 95, 97, 104, 105, 107, 108, 109, 110, 111, 112.*

G. pyrenaicum, *Burm. fil.*, 72†, 75, 80, 83, 85, 88†, 89†, 95 (?), 96†, 100.

G. molle, *L.*, all, probably in some (*e.g.* Orkney) introduced with agricultural seeds.

G. pusillum, *L.*, 77, 80-83, 85, 86, 87†, 88†, 89†, 90, 94-96, 100, 102, 106; (? introduced in some cases not marked).

G. rotundifolium, L., 82†, 83†.

G. dissectum, *L.*, *except 108, 112.*

G. columbinum, *L.*, 73†, 75, 77 (?), 80, 81, 83, 85-90, 99 (?), 102.

G. lucidum, *L.*, *except 78, 79, 94, 95, 97, 101, 102, 103, 107, 108, 109, 110, [111], 112.* Undoubtedly introduced by man in N.E. Scotland, and probably so in a good many other districts.

G. Robertianum, *L.*, all.

Erodium cicutarium, *L'Herit.*, *except 78, 79, 111* (?), *112.*

E. moschatum, L'Herit., casual in 73, 80†, 88†, 92.

E. maritimum, *L'Herit.*, 74.

Oxalis Acetosella, *L.*, *except 112.*

O. corniculata, L., a garden weed here and there, *e.g.* in 72-74, 92.

Impatiens Noli-tangere, L., 72†, 74†, 77†, 80†, 83†, 87 cas., 90†, 95†.

I. fulva, Nuttall.

I. parviflora, DC., 73†.

[1] *Radiola linoides*, Roth, shows a very frequent association with *Centunculus minimus*, L. On several occasions the discovery of one of these local plants has led me to look for the other, and I have seldom failed on these occasions to find it, though previously unaware of its occurrence in the locality.

Ilicineæ.

Ilex Aquifolium, *L.*, *except 93, 106, 107, 109, 111, 112.* Marked with † for 74 and 99, and should perhaps be so in some other districts.

Celastrineæ.

Euonymus europæus, *L.*, 72, 73, 77 (?), 80, 81, 83 (??), 86†, 109 (?).

Rhamnaceæ.

[1] Rhamnus catharticus, *L.*, 72†, 73†, 91†, 92†, 94†, 100†.

R. Frangula, *L.*, 72†, 73†, 75, 86†, 89, 91†, 92†, 93†, 95, 106†, 107†. A doubtful native, at least in Mid and North Scotland.

Sapindaceæ.

Acer Pseudoplatanus, L., introduced by man, probably into almost every district in Scotland, and very readily naturalising itself and spreading by seedlings.

A. platanoides, *L.*, is also a widespread, though less abundant, introduction in many districts.

A. campestre, *L.*, occurs in 72-74, 76-78, 80, 81, 83-85, 89-92, 98, 100, 102, 109, and probably in most other districts; but there is no sufficient evidence that its presence anywhere in Scotland is not due to man.

Leguminosæ.

[2] *Lupinus perennis*, L., 88†, 89†, 91†, 92†, 106†, 111†.

Genista anglica, *L.*, 72-74, 77, 79-83, 85-97, 106.

G. tinctoria, *L.*, 72-74, 80, 81, 83 (?).

Ulex europæus, *L.*, all, but noted as † in 103, 111, 112.

U. Gallii, *Planch.*, 72-74, 80, 93† (?) (once).

U. nanus, *Forster*, 72, 73, 74 (?), 75; very doubtfully in 81, 83, 85, 90, 95.

Cytisus scoparius, *Link, except 110, 111†, 112.*

b. prostratus, *Bailey*, 92 (high level on Ben-a-Bourd).

Ononis repens, *L.*, *except 97, 101, 103, 104, 105, 107, 109, 110, 111†, 112.*

O. spinosa, *L.*, 72-74, 75, 81-83, 85, 86, 90 (?), 99 (?).

[1] *Rhamnus*, L.—Both *R. catharticus* and *R. Frangula* are not infrequent in some districts in localities that occasionally suggest them as Scotch plants; but there is not sufficient evidence to regard them as indigenous.

[2] *Lupinus perennis*, L., has been very thoroughly naturalised for a good many years beside the Dee, Tay, and other rivers in Scotland, and has even altered the bed of the stream by causing the accumulation of rubbish during winter on the shingle beds. In many places it forms such masses as almost to exclude other vegetation. Along the Dee it has materially encroached on the native flora. I have seen it also naturalised on moorland in Orkney.

O. reclinata, *L.*, 74† (?).
Trigonella purpurascens, *Lam.*, 72 (?), 75, 76, 83, 85, 90 (?).
Medicago sativa, L., almost naturalised in a good many districts, *e.g.* 74, 76, 88-90, 92.
M. sylvestris, Fr., 75†.
M. falcata, L., casual or seminaturalised, 92.
M. lupulina, *L.*, *except 101, 104, 110, 111†, 112.*
[1] M. denticulata, *Willd.*, 72 cas., 78† (?), 80† (?), 85† (?), 92 cas.
[1] M. arabica, *Huds.* (*M. maculata*, Sibth.), 74†, 78† (?), 80† (?), 85† (?), 87 cas., 88 cas., 92 cas.
[1] Melilotus officinalis, *Lam.*, 76, 77, 80, 81† (?), 82† (?), 83† (?), 85† (?), 86†, casual in 88-92, 95.
M. alba, Desr., casual in 75, 80-88, 90, 92, 97.
M. arvensis, Wallr., casual in 72, 73.
M. indica, All. (*M. parviflora*, Lam.), casual in 88, 92.
Trifolium subterraneum, *L.*, 75†.
T. pratense, *L.*, all.
a. sativum, Syme, is common in cultivated pastures, and occurs as an escape elsewhere.
b. sylvestre, *Syme*, is the common variety of uncultivated ground.
T. medium, *L.*, *except 105, 109.*
T. ochroleucon, Huds., casual in 72, 92.
T. incarnatum, L., casual, or as a relict of cultivation (*e.g.* in 88, 89).
T. stellatum, L., casual, 88, 92.
T. arvense, *L.*, *except 84, 97, 98, 101, 103, 105, 107, 108, 109, 110, 111* (?), *112.*
T. striatum, *L.*, 74, 75, 80-91, [111].
T. scabrum, *L.*, 82, 83, 85, 90, (91 requires confirmation).
T. glomeratum, *L.*, casual, 88, 89.
T. hybridum, L., very frequent in cultivated fields, and often as an escape or casual.
T. repens, *L.*, all.
T. fragiferum, *L.*, 75, 81-83, 85, 89.
[2] *T. agrarium*, L., 88-96, 106.
[3] T. procumbens, *L.*, *except 98, 110, 111†, 112.*
T. dubium, *Sibth.*, *except 95, 111†, 112.*
a. pygmæum, *S. Willem.*, is not uncommon in dry poor soil.

[1] *Medicago denticulata*, Willd., *M. arabica*, Huds., and *Melilotus officinalis*, Lam., can scarcely be regarded as natives anywhere in Scotland. Indeed, they are little more than casuals wherever I have seen them.

[2] *T. agrarium*, L., is of frequent occurrence in fields in the east of Scotland, but cannot be reckoned indigenous.

[3] *T. procumbens*, L., occurs in two forms: *majus*, Koch (usually the commoner), and *minus*, Koch.

[1] T. filiforme, *L.*, 77 (?), 80, 82 (?), 83 (?), 84 (?), 85 (?), 90 (?), 91 (?), 92 (?), 93 (?), 94 (?), 95 (?), 96, 106 (?).

Anthyllis Vulneraria, *L.*, *except 78.*

b. coccinea, *L.* (*Dillenii*, Schultz), 106, 109, 112.

Lotus corniculatus, *L.*, all.

b. crassifolius, *Pers.*, the sea-shore form, recorded from 73, 74, 89, and 112, but elsewhere in suitable localities.

[2] L. tenuis, *Waldst.* and *Kit.*, 80†, 81-85, 87 (?), 90, 91, 92†.

L. uliginosus, *Schkuhr* (*L. major*, Sm.), *except 95, 96, 97, 104, 105, 106, 107, 108, 110, 111, 112.*

Astragalus alpinus, *L.*, 89, 90, 92.

A. danicus, *Retz.* (*A. Hypoglottis*, L.), 73-75, 81-85, 87-92, 94-96, 102, 107.

A. glycyphyllos, *L.*, 72 (?), 73, 74, 77 (?), 80-91, 93, 94, 95†, 106.

Oxytropis uralensis, *DC.*, 74, 75, 85, 88-90, 98, 106, 108, 109.

O. campestris, *DC.*, 89, 90.

Ornithopus perpusillus, *L.*, 72-75, 77, 83, 85-90, 92†, 93†, 94, 95, 99.

Coronilla varia, L., 72 cas.

Hippocrepis comosa, *L.*, 75, 91 (?).

Onobrychis viciæfolia, Scop. (*O. sativa*, L.), casual (*e.g.* in 83, 90, 92, 95).

Vicia hirsuta, *Gray*, *except 108, 110, 111* (?), *112.*

V. gemella, *Crantz* (*V. tetrasperma*, Mœnch.), [72], 73, 75, 77, 80, 83, 85†, 87†, 88† (?), 90† (?), 92 cas., 103 (?), 112 (?).

V. Cracca, *L.*, all.

V. Orobus, *DC.*, 72, 73, 74, 77, 78, 80, 81, 83-85, 88-90, 97, 103, 104, 108.

V. sylvatica, *L.*, *except 76, 78, 84, 98, 102, 103, 107, 111, 112.*

V. sepium, *L.*, all.

V. lutea, *L.*, 72 cas., 73-75, 83, 85, 88 (??), 90, 91.

V. sativa, L., frequent in cultivation, and as a casual escape.

V. angustifolia, *L.*, *except 78, 79, 81* (?), *82* (?), *98, 99* (?), *101, 102, 103, 104, 108, 109, 110, 111, 112.*

b. Bobartii, *Koch*, a frequent form where the species occurs.

V. lathyroides, *L.*, 73-75, 80-83, 85, 88-96, 99, 100, 106.

V. bithynica, L., 72 cas.

Lathyrus Aphaca, L., introduced or casual in 72, 75, 83, 88, 89, 92.

L. Nissolia, L., casual in 75, 90.

L. hirsutus, *L.*, 75†.

L. pratensis, *L.*, all.

[1] *T. filiforme*, L.—The records for this plant in Scotland are mostly suspicious, small forms of *T. dubium* having been mistaken for it in at least some cases. Mr. A. Somerville found it at Aviemore (96) in 1891.

[2] *Lotus tenuis*, W. and K.—The claims to be indigenous in at least some of the counties recorded should be further investigated.

[1] L. sylvestris, *L.*, 72†, 73-75, 77, 81, 83, 87† (?), 88 (?), 90, 91, 100, 102, 103, 109.

[L. palustris, *L.*, was recorded from Scotland by Lightfoot, but there is no doubt the record was erroneous.]

L. maritimus, *Bigel*, 90, 111 (?), 112.

L. montanus, *Bernh.* (*L. macrorhizus*, Wimm.), all.

b. tenuifolius, *Reichb. fil.*, not infrequently met with.

L. niger, *Wimm.*, 89 (nearly extinct in 1892), 90, 96.

Rosaceæ.

Prunus spinosa, *L.*, *except 109*† (?), *110*, *111*, *112*.

P. insititia, *Huds.*, 72-74, 75†, 76, 77, 80†, 81†, 83†, 85†, 88†, 89†, 90†, 91†, 99, 100, 106 (?), 107.

P. domestica, L., escape, in 72, 73, 86†, Perthshire†.

[2] P. avium, *L.*, *except 84*, *93*, *98*, *101*, *104*, *105*, *106*, *108*, *110*, *111*, *112*.

P. Cerasus, L., 83†, 87†, 88†, 89†, 91†, 92†, 94†.

P. Padus, *L.*, *except 93*, *110*, *111*, *112*.

Spiræa salicifolia, L., occasionally semi-naturalised, *e.g.* in 72-74, 86, Perthshire, 91, 92.

S. Ulmaria, *L.*, all.

b. denudata, *Bœnn.*, recorded by Dr. White from Perthshire, not common.

S. Filipendula, *L.*, 72 (?), 77†, 81, 83, 85, 88, 90, 91†, 92 cas., 106†, 109† (?).

Rubus, *L.* In this genus the determination of the forms is so difficult, and the older records are so often not fully reliable, that I have followed the Rev. W. Moyle Rogers's papers in the subjoined enumeration for the most part. His determinations, based on examples found or seen by himself, are denoted by bare numbers. Mr. Bennett's "Additional Records" have also been drawn upon, and are indicated by "a." For Perthshire (87, 88, 89), Dr. Buchanan White in his "Perthshire Flora" has recorded numerous forms, most of which were determined by Professor Babington. These records are indicated by "w," where not confirmed by Mr. Rogers. All other records unconfirmed by specimens are enclosed in brackets.

[1] *Lathyrus sylvestris*, L., may not be indigenous in some of the districts from which it has been recorded. It is probably not so in 87, 88. It has been questioned as indigenous in 91 (Kincardine); but there seems no good reason in its habitat there, at St. Cyrus, to attribute its introduction to man.

[2] *Prunus avium*, L.—It is difficult to ascertain in how far the Gean is indigenous in Scotland, owing to the easy distribution of its seeds. There is little doubt that it is not indigenous in a number of the counties from which it has been reported.

R. idæus, *L.*, all.
b. obtusifolius, *Willd.* (*Leesii*, Bab.), 72, 85, Perthshire.
c. asperrimus, *Lees*, 87.
R. fissus, *Lindl.*, (72), 73a, 75, 86-91, (92), 96, 97, (98, 99), 105, 106, 111.
R. suberectus, *Anders.*, (72), 73, (74), (76), (81), 86-88, 89w, (90), (92), 96, 97, (98), 105a.
R. sulcatus, *Vest.*, Perth, w.
R. plicatus, *W.* and *N.*, (72), (74), (81), 87, 88, 89w, (90), (91), 92, 96-99, (100), 102, 103, 104a, 105-107.
b. hemistemon (*P. J. Muell.*), (88), 109.
R. Rogersii, *Linton*, 87, 88, 89, 106, 107a.
R. nitidus, *W.* and *N.*, 97.
R. opacus, *Focke*, (107).
R. affinis, *W.* and *N.*, (74), 77a, 87w, 88w, 89w, 94a, 95, 103a, 105a.
R. latifolius, *Bab.*, 83, 84, 88, 89w, 97.
R. carpinifolius, *W.* and *N.*, (72 ?), 88w, 89w, 97, 98, 103, 105, 110 (?).
R. incurvatus, *Bab.*, 76, 87, 88w, 89w, 105, 110.
R. Lindleianus, *Lees*, 72, 73a, 74, 75a, 76, 86-88, 89w, 97a, 99, 100.
R. rhamnifolius, *W.* and *N.*, (72), 73, 74, 85-88, 89w, 92, 95, 98, 105a.
R. nemoralis, *P. J. Muell.*, 87.
b. glabratus, *Bab.*, 86.
R. pulcherrimus, *Neum.*, (72), 73, (74), 87, 97-99, 103-105, 110.
R. Scheutzii, *Lindeb.*, 86-88, 99.
R. Lindebergii, *P. J. Muell.*, 87, 88.
R. Dumnoniensis, *Bab.*, 97, 98, 103.
R. villicaulis (sp. collect.), 72, 77, 86, 88, 89, 96-98, 100a, 103, 105, 106, 108.
a. villicaulis, *Koehl.*, 97a, 106, 108.
b. Selmeri (*Lindeb.*), 72, (74), 77, 84, 86-89, 96-98, 103-105.
c. insularis (*F. Aresch.*), 84, 87, 88, 97, 98, 104, 106, 110a.
R. rhombifolius, *Weihe*, 87, (110).
R. gratus, *Focke*, 89w, 104a, 110.
R. rusticanus, *Merc.*, 75, 89w, 91, 100, 110.
R. thyrsoideus, *Wimm.*, (92).
R. macrophyllus (sp. collect.), 72, (73), 81, 84, 86-88, 92, 95, 96, 98, 100, 105, 106.
a. macrophyllus, *W.* and *N.*, 84, 88w, 89w, 98, 100, 106.
b. Schlechtendalii (*Weihe*), 84, 96, 98, 106.
d. amplificatus (*Lees*), 72, 88w, 89w, 100.

R. Sprengelii, *Weihe*, 73a, 74a, 89w.
R. micans, *Gren.* and *Godr.*, 88, 107.
R. hirtifolius, *Muell.* and *Wirtz.*, 86, 98.
b. danicus, *Focke*, 86-88, 98, 102, 108.
R. pyramidalis, *Kalt.*, 87, 88w, 89w, 96, 97, 105.
R. leucostachys, *Schleich.*, 81, 105a, 107.
R. mucronatus, *Blox.*, 81, 84-89, 91, 92, 96-98, 100, 102, 103, 105-107, 110.
R. melanoxylon, *M.* and *W.*, 87.
R. infestus, *Weihe*, 72a, 86-89, 97.
R. Drejeri, *G. Jensen*, 86, 87.
R. radula (sp. collect.), 72-75, 79, 83, 85, 86, 88, 89, 91, 103, 105, 106, 110.
a. radula, *Weihe*, 85, 86, 88, 103, 104, 106, 110.
b. anglicanus, *Rogers*, 87.
c. echinatoides, *Rogers*, 84, 86-88.
R. echinatus, *Lindl.*, 76, 81, 86, 88w, 89w, 95.
R. oigoclados, *Muell.* and *Lefv.*
b. Newbouldii, *Bab.*, 85.
[R. Lejeunei, *W.* and *N.*]
? *b.* ericetorum, *Lefv.*, 88, 89w.
R. thyrsiger, *Bab.*, 104.
R. rosaceus (sp. collect.), 88, 89, 97.
b. hystrix, *W.* and *N.*, 89.
d. Purchasianus, *Rogers*, 91, 92.
e. infecundus, *Rogers*, 97, 99.
R. Koehleri (sp. collect.), 72-74, 82, 83, 87-89, 100.
b. pallidus, *Bab.*, 72, 87, 88, 89w, 100.
R. plinthostylus, *Genev.*, 73.
R. serpens, *Weihe.*
b. rivularis, *Muell.* and *Wirt.*, 86.
R. hirtus, *W.* and *K.*, 73.
R. britannicus, *Rogers*, 86-88.
R. dumetorum, *W.* and *N.*, 86, 88, 89, 106.
a. ferox, *Weihe*, 81.
b. diversifolius (*Lindl.*), 86, 89w, 106.
e. tuberculatus, *Bab.*, 86, 88, 89.
g. fasciculatus, *P. J. Muell.*, 88w, 89.
R. corylifolius, *Sm.*, 73, 74, 76, 81, 86-89, 91, 92, 94, 96, 97, 100, 104, 105a, 106, 107, 109, 110.
a. sublustris (*Lees*), 73, 74, 86, 88, 89, 91, 92, 94, 104.
b. cyclophyllus, *Lindeb.*, 74, 76, 86, 89, 91, 92, 100.
R. Balfourianus, *Blox.*, (73), 81, 89.
R. cæsius, *L.*, 74, 80, 84, 86-88, 89w, 91, 109.
c. arvensis, *Wallr.*, 80.
R. saxatilis, *L.*, *except 78, 82, 84.*

R. Chamæmorus, *L.*, 72, 77-81, 83, 86-94, 96-98, 105-109.
[R. arcticus, *L.*, was recorded many years ago from Ben-a-Ghlo, in 89, but almost certainly in error.]
Dryas octopetala, *L.*, 87-90, 92, 96, 98, 101, 104, 105, 108, 111.
Geum urbanum, *L.*, *except 102, 104, 110, 111*† (?), *112.*
G. rivale, *L.*, *except 110.*
G. intermedium, *Ehrh.* (urbanum × rivale), *except 78, 84, 92, 93, 94, 96, 101, 102, 103, 104, 105, 107, 108, 109, 110, 112.*
G. macrophyllum, Willd., 92† (in one place abundant).

(*To be continued.*)

ZOOLOGICAL NOTES.

[We have pleasure in bringing under the notice of our readers the invitation and information contained in the following letter.—Eds.]

International Congress of Zoology—Cambridge Meeting, 1898.

3 Hanover Square, London, W.,
December 1897.

Sir,—As the Fourth Congress of Zoologists is to be held in England, we have the honour to express to you our hope that you will be able to be present, and aid us in making the Fourth Congress as useful and important as the three which have preceded it. A Committee of Reception has been formed in Cambridge, where the Congress will meet on the 23rd August 1898, and we believe that the members of that University and others will accord a hearty welcome to the Congress and make every arrangement for the convenience of our meetings. It may be of interest to you to know that an International Congress of Physiologists will be held at the same time in Cambridge. We propose at a later date to send you further information on the more important subjects which will be brought forward for the consideration of the Congress.—We remain, Sir, your obedient Servants, John Lubbock, *President.*

[Here follows a List of the General Committee, in which are the names of the leading Scottish zoologists.—Eds.]

Lesser Shrew in Tiree.—On the 24th of December last, I received in the flesh, from my valued correspondent Mr. Peter Anderson, a Lesser Shrew (*Sorex minutus*) which he had captured on the island of Tiree. Mr. Anderson informs me that, although he has lived twelve years in the island, he has only seen this example, and one other which he noticed the day before the capture was made. While acknowledging that this Shrew may occur in more of the islands, Messrs. Harvie-Brown and Buckley only mention its

presence in Eigg in their "Fauna of Argyll and the Inner Hebrides." —Wm. Eagle Clarke.

The Badger in Kirkcudbrightshire.—In Mr. Robert Service's "Mammalia of Solway," in a previous volume of the "Annals" (1896, p. 204), one of the last Badgers (*Meles taxus*) in the Solway district is said to have been killed near Dalbeattie in 1870. It may be useful to record that, a few years before that date, two Badgers escaped from a ship lying at anchor in Gibb's Hole. Both of them were trapped by keepers about the same date as Mr. Service gives. The one was on Munches estate and the other at the Scaur. So that it is very probable that the Badger Mr. Service mentions was one of these, and not a native.—Norman B. Kinnear, Edinburgh.

The Harvest Mouse in Renfrewshire.—There is preserved in the Free Museum, Paisley, the nest of a Harvest Mouse (*Mus minutus*, Pallas). This nest was found by me in the parish of Kilbarchan in the beginning of the winter of 1895. It was by the side of a hawthorn hedge, about which there had grown many rank specimens of the reed canary grass (*Phalaris arundinacea*). The stalks of this grass were still standing, but withered, and the nest was fastened to some two of the stalks and a small twig of hawthorn. The nest stood a little over two feet from the ground; was composed almost entirely of the blades of *Phalaris arundinacea*; was round in shape; and, as it now stands in the museum, it measures $3\frac{1}{4}$ in. by $3\frac{3}{4}$ in., the latter being its height. To me it seems difficult to give an accurate description as to how the blades are fastened together. There is no cement used, but on the outer walls of the nest the flat blades of grass are spirally twisted round, so that when the nest is tenanted by a family of young it would seem as if the whole fabric expanded and its walls became tighter and closer knit together. On looking at the nest there seems to be no entrance to it, and it is probably entered from below. The blades of the grass composing the interior of the nest are finely cut and torn. By the side of the hedge where the nest was found one of the fields had been cropped with cereals. I have also seen the nest of the Harvest Mouse in Abbey Parish, Renfrewshire, built in the same manner as the above described, but finer in appearance from finer blades of grass having been used. I have seen as many as three of them within a few feet of each other, but in these cases only raised from 5 to 8 inches above the ground. They were also at the root of a hawthorn hedge by the side of a cornfield, and were observed in the winter months when the hedges were leafless.—J. M. B. Taylor, Curator, Free Museum, Paisley.

The White-beaked Dolphin in the Moray Firth in January.—On the 12th of last January a female *Lagenorhynchus albirostris* got

entangled in the fishing-net of a Portessie boat, and, being captured, was landed at Buckie. I examined it a few days after, and identified the species, though the colour was somewhat abnormal. The fins and flukes of the tail had been cut off, so that exact measurements could not be taken. The total length of the animal was about 7 feet. The colour was black above, changing to gray along sides and on ventral surface; with only a narrow white stripe along the median ventral line; very little white on the snout, which projected about 3 inches beyond the forehead. The lower jaw projected about an inch beyond the upper. The skull measured: total length, 18 in.; breadth, behind orbits, 9½ in.; height, 8 in.; length of rostrum, 9 in.; length of mandible, 14½ in.; teeth, $\frac{2}{2}\frac{7}{7}$ and $\frac{2}{2}\frac{7}{7}$, the largest were ½ of an inch in diameter. It is stated by Mr. Evans in his "Mammals of the Edinburgh District" that this species has only been found on our coasts in July, August, and September. I thought this species worth recording, as no mention is made of it in Messrs. Harvie-Brown and Buckley's "Vertebrate Fauna of the Moray Basin."—Wm. Taylor, Lhanbryde.

Hyperoodon rostrata in the Moray Firth.—In November 1894 a male of the Common Bottlenose Whale was cast ashore at Burghead. The specimen measured 24 feet 6 inches in length, and was 13 feet in girth. Messrs. Harvie-Brown and Buckley mention only two occurrences of this Cetacean in their "Fauna of Moray," and the specimen now recorded does not appear to have come under their notice.—Wm. Taylor, Lhanbryde, Elgin.

An Old Note on Ailsa Craig.—I have never seen any writer on ornithology alluding to the subjoined note on Ailsa Craig, and it will no doubt be new to many readers of the "Annals." I make the quotation from Robertson's 'Historic Ayrshire," in which there is reproduced a "Description of Carrick in 1696, by William Abercrummie, Episcopal Minister of Maybole." Abercrummie states, speaking of the people of Carrick that: "They have plenty of poultry, hens, capons, ducks, geese, and turkeys, at easie rates; and for wild-foul, partridge, moor-foul, blackcocks, pliver, no place is better provided: besyde, store of solan-geese in so great plenty, that the very poorest of the people eat of them in their season, at easie rates: besides other sea-fowls, which are brought from Ailsa, of the bigness of ducks, and of the taste of solan-geese, and are called *Albanacks* or *Ailsa cocks*, and *Tarnathans*, of which there is so great a multitude about that Isle, that when, by the shot of a piece, they are put upon the wing, they will darken the heavens above the spectators. This Ailsa is a rock in the sea, in which those solan-geese nestle and breed; in which also there be conies and wild doves."—John Paterson, Glasgow.

[The Albanack, or Albunac, or "Ailsa Cock," is, we believe, the Puffin; and the Tarnathan the Guillemot.—Eds.]

Jays in Scotland.—In the January number of the "Annals" the reappearance of Jays (*Garrulus glandarius*) is reported from Dumfriesshire and Berwickshire. I have heard also that one at least has been shot in the Stewartry of Kirkcudbright. Mr. Service suggests that these are birds on migration. Possibly; but I venture to suggest another explanation. In 1891, being anxious to restore Jays to this part of the country (Wigtownshire), I obtained twelve young birds from Mr. Baker of Mount Street, and, having kept them in a pheasant pen till full grown, released them in the autumn of that year. They have bred regularly since then, but do not appear to increase in numbers in these woods. It is possible that some of the offspring of this colony have spread to neighbouring counties. Game preservers may look upon this as a mischievous experiment, but I submit that the beautiful Jay is not one whit more injurious to game than the grimy, and far more numerous, Jackdaw. As for the effect on game at Monreith, the tenant of the shooting there reports having shot 11,500 Partridges in the last three seasons, (1895-96, 1896-97, and 1897-98), of which the last was a bad breeding season in these parts. Of Pheasants, he turned down 1200 during the present season and shot 1400, which does not look as if the presence of a few Jays was very hurtful.—Herbert Maxwell.

The Garden Warbler South of the Grampians.—Mr. Saunders's "Manual of British Birds" is the best book on the distribution of birds in Scotland, yet in the case of the Garden Warbler (*Sylvia hortensis*) the information regarding Scotland in the new edition (pt. ii.) is not quite up to his usual standard. It would appear, from Mr. Saunders's account, that the fact of this species being more abundant in "Solway" than the Blackcap was a distinction particular to that region; but a similar state of matters obtains, Mr. Evans tells me, in "Forth," and the same may be said of "Clyde." I find it general in suitable places in localities widely separated; for instance, throughout the Girvan valley in South Ayrshire, in the Glasgow district, and in the orchard country in Lanarkshire. It is a bird of Loch Lomond, although omitted from Mr. Lumsden's list, and accounts of its nesting continue to be communicated to me from different "Clyde" localities. The Blackcap is less numerous and consequently less known. What I really desire to bring out is the fact that the Blackcap south of the Grampians is far more local than the Garden Warbler, whereas Mr. Saunders tells us regarding England, that there the last-named is "far more local" than the former!—John Paterson, Glasgow.

Hawfinch in Midlothian.—On the 9th of March a Hawfinch (*Coccothraustes vulgaris*) was picked up dead in the shrubbery at Arniston, the seat of Robert Dundas, Esq., who has kindly pre-

sented the specimen to the collection of British Birds in the Museum of Science and Art, Edinburgh. On examination I found the bird to be an adult female, in perfectly fresh condition.

It may be remembered that in this magazine ("Annals," 1894, pp. 195-197) I recorded the capture, on the 3rd of August 1894, of a young bird only a few weeks old from this very place. This bird, too, I saw in the flesh; and it was presented to the Museum by Mr. Dundas. The rediscovery of this species at Arniston is a fact of extreme interest; and, when considered in conjunction with the young bird's occurrence (in the same grounds), there can, I think, be little doubt that the Hawfinch is now a resident species in Scotland. Prior to the first Arniston capture, the Hawfinch was only to be regarded as a rare *winter visitor* to Scotland, very few instances of its occurrence having been recorded, all for that season.

Mr. Dundas remarks that no other examples have been seen. That this should be so is not surprising when one remembers the shy nature and retiring habits of this species.—Wm. Eagle Clarke, Museum of Science and Art, Edinburgh.

Goldfinch in Caithness.—On the 4th of March I saw a Goldfinch at Berriedale in Caithness. As this bird is considered a very rare species by Messrs. Harvie-Brown and Buckley in their "Fauna of Sutherland and Caithness," the occurrence may be worth placing on record.—John Godfrey, Edinburgh.

Goldfinch in Mid-Perth.—Mr. R. Ramsay, late schoolmaster Fearnan, Loch Tay, tells me that in January 1897 he watched a flock of eight or nine goldfinches (*Carduelis elegans*) feeding on knapweed by the roadside immediately to the west of Fearnan.—William Evans, Edinburgh.

Chiffchaff, Wood Wren, and Black-throated Diver in East Renfrewshire.—In our 'List of the Birds of East Renfrewshire' ("Annals," October 1895) we were unable to include the Chiffchaff (*Phylloscopus rufus*) and Wood Wren (*P. sibilatrix*) as breeding species. Last summer (1897) both nested in a small wood at Giffnock. An immature Black-throated Diver (*Colymbus arcticus*) shot on Balgray Dam, Mearns, on 20th December last, is an addition to our list.—John Paterson and John Robertson, Glasgow.

Waxwing in Ayrshire.—Several notices of occurrences of the Waxwing (*Ampelis garrulus*) in Scotland this winter having already appeared, it may be of interest to point out that in the Natural History Notes by the Rev. D. Landsborough in the "Kilmarnock Standard" of 22nd January last a female is recorded as having been "shot a fortnight ago near to Riccarton Moss . . . it was accompanied by another."—John Paterson, Glasgow.

Waxwing in the Lothians.—Mr. Hope, taxidermist, Edinburgh, informs me that a bird-catcher caught a Waxwing with bird-lime near Levenhall, Musselburgh, in November last. It lived only a few days.—WILLIAM EVANS, Edinburgh.

Waxwings at Loch Lomond.—In January last a flock of seven Waxwings (*Ampelis garrulus*) were seen on one of the small islands near the mouth of the Endrick, and one of them was shot. I have not seen the bird, but Mr. Lees, Alexandria, tells me it is an immature specimen.—JAMES LUMSDEN, Arden, Loch Lomond.

A Cuckoo in Captivity.—There are so few instances, I believe, on record of a Cuckoo (*Cuculus canorus*) surviving two winters in this country that the following case may be of interest. In the summer of 1896 Mr. Cochrane, a well-known bird-dealer in Market Street, Edinburgh, had a Cuckoo brought to him which had been taken from a Meadow Pipit's (*Anthus pratensis*) nest in Wigtownshire. He was successful in rearing it, the principal food given being meal worms, of which it soon grew very fond. Towards the end of February 1897 the Cuckoo began to moult, and in a week or two was in perfect plumage. It then commenced its well-known call, and continued crying till near the end of July. At that time it began to be restless, and evidently felt the migratory instinct very strongly. It quietened down again after a time, and then began to moult for the second time that year, but did not regain the same brilliancy of plumage. This spring the Cuckoo is again in the moult, and when I saw it at the beginning of March it was near the fireside pruning its feathers. The bird is allowed full liberty inside Mr. Cochrane's house, and it appears to be not at all timid.—CHARLES CAMPBELL, Dalmeny Park.

Red-footed Falcon (*Falco vespertinus*, Linn.) **in Scotland.**—As Mr. Sim's reference, at page 251, in the "Annals" for October last is apt to mislead those unacquainted with the district, may I be permitted to point out that Hauxley (the locality for his second *Scottish* example of this rare bird) is really in Northumberland, and quite 30 miles south of the Border.—GEORGE BOLAM, Berwick-on-Tweed.

Wild Geese migrating at a great height.—About the beginning of last October I saw a lot of Geese coming in from the north-west at a great height—over two miles, I should think. I put up my telescope to look at them, and there, right away more than two miles above them, were another lot of seventeen Geese, between me and the blue sky. These last were quite invisible to the naked eye. They were in a straight line, one after the other; while the lower party were flying in the shape of the letter <. As I can see Geese at three miles on the horizontal with my unaided eye, I calculated that these Geese must have been from four to five miles high. If it

had not been for a patch of sky cloud, they would have been quite invisible, even with the aid of a telescope.—Peter Anderson, Tiree.

Shelduck carrying its Young.—Mr. Lees, bird-stuffer, Alexandria, tells me he got a young Sheldrake (*Tadorna cornuta*) in the down in rather a curious way on 11th June last. The young one was dropped by an old bird which was flying over Alexandria, about two miles from Loch Lomond. A man saw the young bird drop, and watched the old bird for some time fly round and round quacking. He picked up the little bird, and the parent bird went off in the direction of Loch Lomond.—James Lumsden, Arden, Loch Lomond.

Gadwall in Moray.—Since the "Fauna of Moray" was published, I have learnt from Captain Dunbar-Brander that a Gadwall (*Anas strepera*) was shot on Loch Spynie somewhere about 26th August 1892. This year another was killed at the same place by his son on the 4th of February.—T. E. Buckley, Inverness.

Hybrids between Capercaillie and Pheasant.—Mr. Eagle Clarke, in his paper on 'Hybrids between Capercaillie and Pheasant in the January number of "The Annals of Scottish Natural History," quotes a small misstatement. Notwithstanding the statement made by M. Suchetet in his recently published work, I beg to say that the hybrid now in the collection of the Hon. Mr. Rothschild, at Tring, was *not got here*. I think, however, I can explain how the mistake has occurred. Mr. Rothschild purchased his bird from a London dealer, under the belief that it was my bird, which at that time was the only recorded specimen of hybridism between Capercaillie and Pheasant. My bird was figured by Mr. Millais in his book on "Game Birds." Some time after, I heard that Mr. Rothschild thought he had my bird. So I wrote and told him that, as it was still in my possession, it could not be so. Since then he has made many efforts to find out where his bird was killed, but all the information he can get is that it was purchased as a mounted specimen from some one in the north of Scotland. I am perfectly certain that it was not killed in this district, having made very full inquiries into the matter here. M. Suchetet must have got his information about the Tring specimen at the time Mr. Rothschild was under the belief that he had my bird. —James Lumsden, Arden, Loch Lomond.

[Mr. James Brown, taxidermist, Forres, informs me that he received for preservation, on the 10th of November 1890, a pair of hybrids between the Capercaillie and the Pheasant. One of these birds, Mr. Brown tells me, was sold to a gentleman in London, and that the other is in the possession of Mr. Grant of Aviemore. Mr. Grant kindly writes me that he got the hybrid between the Capercaillie and the Pheasant, now in his possession, from a

gentleman who was shooting at Aviemore some years ago, when there was a brood of these hybrids at Rothiemurchus. Mr. Grant thinks that he has hybrids of both sexes. The cock he describes as being much larger and stronger than a Pheasant, which the bird somewhat resembles, having the breast, wings, and tail of that bird, and is about 33 inches in length.—W. E. C.]

Capercaillie in S.E. Lanarkshire.—Mr. James Davidson informs me that an old male Capercaillie (*Tetrao urogallus*) came to Dolphinton about nine years ago. It was there for about two years alone. The hen or hens came, and for several years there were broods on the South Hill on the border of the adjoining county—Peeblesshire—in a large wood about a mile long by a quarter of a mile wide. All were shot out on the Peeblesshire side, but not upon Dolphinton, where they were always carefully preserved. At present there are none, all having been shot out. Mr. Davidson was informed of these facts by the keeper and by Kenneth Ord Mackenzie, Esq.—J. A. Harvie-Brown.

Great Skua in the Moray Firth.—A Great Skua (*Stercorarius catarrhactes*) was shot on 15th October 1897 at the Buckie Loch, near Forres, by Lieutenant-Colonel E. Astell, his attention being drawn to it by seeing it mobbed by Gulls. This is a late date for this summer species to be seen, and appears to be the first well authenticated instance of its occurrence in the Moray Firth.—T. E. Buckley, Inverness.

Acherontia atropos—the Death's-head Hawk Moth—in Renfrewshire.—On Saturday, the 12th June 1897, a living specimen of this moth was taken in the eastern suburbs of Paisley. The moth was got hanging on a bush, and was in very perfect condition. It was kept over Sunday in a box, in which it died. This specimen was brought to the Museum, Paisley, by Mrs. Ross, Ellonvilla, Paisley. The species is more generally got in the imago state in the autumn months, but is well known as also occurring in June. W. F. Kirby says ("European Butterflies and Moths," 1889, p. 68) that "hybernated specimens, or specimens from hybernated pupæ, are sometimes found in June."

As to the article by Mr. Robert Service ("Annals," October 1897, p. 257) pointing out that the imagos are more general than the larvæ, my experience, so far as Renfrewshire is concerned, is the very reverse. The larval state is by far the most abundant, yet very few of them reach the adult condition. The larvæ feed among potatoes, and when it is borne in mind that most of the potato crops are now dug by machinery the destruction of such large larvæ is easily accounted for. In this district they must be of general occurrence, for the appearance of such strange creatures has been described to me over and over again by those who work

among the potatoes. In some cases the narrator has spoken of the "chirpin'" sound they give out. A very remarkable instance of the larvæ occurring in great abundance was on a farm near Port-Glasgow, Renfrewshire. In this case they were obtained in potato-pits, and the farmer said he could have got barrowsful of them, they were in such abundance. This farmer took some of them to a friend, who confirmed what they were. Mr. Archibald Allison, teacher, South Public School, Paisley, described to me a remarkable larva got in a potato-field, and from his description I at once inferred it was the larva of this moth. I have since shown him Mr. Allison Kirby's coloured figure, which he at once recognised. This larva was got on Ormaig farm, parish of Kilmartin, Argyleshire, on the estate of Lord Malcolm of Poltalloch, in the month of August 1893.—J. M. B. Taylor, Curator, Free Museum, Paisley.

Tæniocampa gracilis (*Fb.*) **in Scotland.**—From Mr. Evans's interesting notes ("Annals," 1896, p. 259, and 1897, p. 258), I am inclined to think that this species is not so well known in Scotland as it should be. For the last seven years I have taken it regularly in the Rannoch district of Perthshire, my average catch being about one hundred and fifty specimens every season. It is curiously uncertain in its appearance, being more abundant every alternate season. For instance, last year (1897) I only saw three, while in 1896 I caught a splendid series of over three hundred, and I know of other two hundred caught by another collector. The Scotch forms are quite distinct, and may be tabulated as follows:—

1. Pale ochreous-cream, unicolorous, subterminal line pale cream.
2. Pale pinkish-cream, unicolorous.
3. Pale pinkish-cream, veins, and subterminal line cream.
4. Pale pinkish red-brown, unicolorous.
5. Pale pinkish red-brown, veins, and subterminal line cream.

All the forms are occasionally to be found slightly dusted with blackish scales. Varieties 4 and 5 must not be confounded with the dark red forms found in the New Forest. Ours are quite distinct, and may be described as intermediate between the ordinary English form and the New Forest variety mentioned above. There is a peculiar pinkish flush about the Scotch insect, which is never present in English examples.—Wm. Reid, Pitcaple.

On the recurrence of Eucalanus crassus, *Giesbrecht*, in the Moray Firth.—In the "Fifteenth Annual Report of the Fishery Board for Scotland" (part iii. p. 312) I reported the occurrence of *Eucalanus crassus* in some tow-net gatherings from the Shetland section of the Faroe Channel, collected in July and August 1896; and in the Annals of Scottish Natural History for April 1897 I

published a note referring to its occurrence, along with *Rhincalanus gigas*, Brady, in the Moray Firth. In the note on the species in the Fishery Board's Report referred to I described briefly its distribution, which, so far as known, seems to be tropical or subtropical. It is very interesting, therefore, to find these appearances of this *Eucalanus* in the regions mentioned. The recurrence of *Eucalanus crassus* in the Moray Firth last year is a further evidence of the extensive distribution of the species, whether brought about by currents or otherwise. The specimens referred to in the previous Moray Firth record were captured off Nairn; and on the present occasion the specimens—three in number—were taken a little to the west and south of Golspie. In the female of this species the abdomen is very short, and the first abdominal segment much dilated; in the male two short setæ project at an obtuse angle and spring from the posterior edge on each side of the second-last thoracic segment. No other *Eucalanus* possesses this character.—Thomas Scott, Leith.

On the recurrence of Labidocera wollastoni, *Lubbock*, and Isias clavipes, *Boeck*, in the Firth of Clyde.—I recorded these two species of Copepoda for the Firth of Clyde in 1896, in the "Transactions of the Royal Physical Society of Edinburgh" (vol. xiii. p. 174). *Isias* had been previously recorded for Scotland in 1878 by Dr. G. S. Brady in the "Monograph of British Copepoda" (vol. i. p. 64, and figure), but that was the first time *Labidocera* had been recorded from the Scottish seas. They are both well marked species, and do not appear to be very common. They were obtained last year in tow-net gatherings collected near the seaward limits of the Clyde estuary. On the previous occasion they were both found in some material collected in Machrie Bay, Arran. Dr. Brady's Clyde record of *Isias* is for Cumbrae.—Thomas Scott, Leith.

Paracalanus parvus, *Boeck*, in the Firth of Clyde.—This is a small but distinct species, and one that seems to be widely distributed. It was common in a gathering of Entomostraca collected a few years ago at the mouth of the Firth of Forth, and has also been observed in one or two other places off the coast of Scotland, but has not before been recorded from the Clyde. The Clyde tow-net gatherings in which it was obtained were made in September last year: one in Kilbrennan Sound and the other one from the vicinity of Ayr Bay. It has also been taken near the Bass Rock. Probably it may have been passed over previously as a young *Calanus*.—Thomas Scott, Leith.

BOTANICAL NOTES AND NEWS.

On Primary Characters in Cerastium.—Mr. F. N. Williams ("Journ. Bot.," 1898, pp. 8-10) discusses the value of the characters assigned to *Cerastium*, and comes to the conclusion that the genus may be divided into three subgenera as below (characterised in Latin, which is translated for general use of our readers):—I. *Dichodon.*—Petals deeply emarginate. Styles 3. Capsule straight, dehiscing by 6 teeth, which are erect or spreading and subrevolute at margins. Herbs annual or perennial. II. *Strephodon.*—Petals incised or emarginate. Styles 3 or 5 (sometimes 4). Capsule straight or curved, dehiscing by 6 or 10 teeth, circinato-convolute at apex, not revolute at margin. Herbs annual or perennial, dichotomously branched, many flowered, rarely simple, corymbosely or subumbellately cymose. III. *Orthodon.*—Petals incised, emarginate or laciniate. Styles 5. Capsule straight (but sometimes slightly curved at tip), or more or less curved at base, usually longer than calyx, very seldom shorter, dehiscing by 10 teeth, erect or spreading erect, flat on back or revolute at margin. Herbs annual or not often perennial, varied in habit and in arrangement of flowers.

Distribution of British Mosses.—Mr. E. C. Horrell proposes to compile a census of British Mosses under the Watsonian counties and vice-counties, and he appeals in the "Journal of Botany" (1898, pp. 60-62). He says: "I have looked through most of the magazines, County Floras, Proceedings of Local Natural History Societies, the Botanical Record Club Reports, etc., in the library of the British Museum, and find that fairly good lists have been published for about fifty vice-counties. There are therefore about sixty-two vice-counties in Great Britain for which I can find no lists of the commoner mosses." Among those from which he has "found no satisfactory lists," he enumerates from Scotland the following:—Wigtown, Ayr, Renfrew, Lanark, Peebles, Selkirk, Roxburgh, Berwick, Haddington, Edinburgh, Linlithgow, Stirling, West Perth, Mid Perth, East Perth, Kincardine, S. Aberdeen, N. Aberdeen, Banff, Elgin, Easterness, Westerness, Main Argyle, Dumbarton, Clyde Isles, Kintyre, S. Ebudes, N. Ebudes, W. Ross, E. Ross, E. Sutherland, W. Sutherland, Caithness, Hebrides, Orkney, Shetland.

We are unaware of what Mr. Horrell regards as a "satisfactory list"; but, unless he sets aside previous records as unreliable, we fear he has overlooked a good many published records from some of these districts. We cordially recommend his project to all Scotch botanists able to assist him by bringing to his knowledge information previously overlooked or still unpublished. His address is 44 Brompton Square, London, S.W.

Ranunculus petiolaris.—I recently learned from Mr. Arthur Bennett that this name is preoccupied; it was used by Boupland, Humboldt, and Kunth in their "Nova Genera et Species Plantarum," vol. v. p. 45 (1821), when describing a Mexican buttercup, which their figure (No. 428) shows to be a totally different plant from mine. The West Highland *Ranunculus* published some years since under this title may bear the name of *R. scoticus* for those who, like myself, believe it to be specifically (or subspecifically) distinct; if it is regarded as a variety, I suppose that it can stand as *R. Flammula*, L., var. *petiolaris*, Lange, according to my original description.—Edward S. Marshall.

Plants of West Ross.—**Hieracium argenteum*, Fries, occurred on the Cnochan Cliffs in 1892. Accidentally omitted from my list in "Trans. Bot. Soc. Edin.," 1894, p. 148.

**Carex limosa*, L.—Near Gairloch.

Asplenium marinum, L.—Isle of Longa. T. B. Cartwright, in Herb. Oxon.—G. Claridge Druce.

Rosa dumetorum, *Thuill.*—I found this Rose about Brodie, Nairn, in 1896, and *Rosa coriifolia*, Fries, about Elgin. M. Crépin has named both of these.—G. Claridge Druce.

Poa cenisia, *All.*, *var.* **flexuosa** (*Wahl.*), **a new species of Grass in Scotland.**—Last August, during my search for *Carex helvola*, I found a *Poa* in small quantity on the south-west cliffs of Ben Lawers, which was new to me. Professor Hackel writes to me, in a letter received this day (14th March), that it is identical with specimens from the Dovrefield of *Poa flexuosa*, Wahl.—the *Poa arctica*, Brown, which is put by Nyman as a sub-species of *Poa cenisia* of Allioni. It has not been previously recorded for Great Britain.—G. Claridge Druce.

Set of British Willows issued by Rev. Edward F. Linton, M.A., F.L.S., and Rev. William R. Linton, M.A., F.L.S.—The fourth fascicle, issued in February 1898, contains 37, instead of 25, numbers. Like the earlier fascicles, it is noteworthy for the care with which it has been prepared and for the excellence of the preparations. 32 forms are illustrated, of which 27 are hybrids. Of the latter, several have been artificially produced in cultivation. They represent crosses that might occur in nature from the association of the parent species. A number of the specimens in this fascicle are from localities in Scotland, or have been taken from plants brought from Scotland and cultivated. Scottish botanists will find this collection of Willows a valuable aid in working out local forms of a difficult genus.

British Sedges.—In a paper on British species of *Carex* in the *Journal of Botany* (1898, pp. 73-82), the Rev. E. S. Marshall notes the following from Scotland:—

Carex chordorhiza, L. (from wet peat-bogs at Altnaharra, in Sutherland, where it was found by Mr. Marshall and Mr. Shoolbred as new to Britain), is described on p. 73, and figured on plate 383.

C. echinata, Murray, var. *grypus* (Schkuhr), from Allt Giubhas, near Kingshouse, Argyleshire, which seemed distinctly the variety, changed after cultivation for a year into normal *echinata.*

C. curta, Good., var. *alpicola*, Wahlb., of British botanists, from moor near Little Culrannoch, from Driesh Hill, and from Sow of Athole, were named by Herr Kükenthal *C. canescens*, var. *robustior*, Blytt.

C. ovalis, Good., var. *bracteata*, Syme. The elongation of the bract is too inconstant to uphold a variety by it.

C. rigida, Good., var. *inferalpina*, Læstad. Specimens from Little Culrannoch and Glas Maol were confirmed as of this variety by Herr Kükenthal.

C. aquatilis, Wahlb. Specimens from tableland above Corrie Kander, Aberdeenshire, were referred by Herr Kükenthal to var. *epigeios*, Anderrs., while the plant distributed by Dr. F. B. White from White Myre of Methven, Perthshire, as var. *epigeios* he refers to "*C. vulgaris*, Fr., γ *elatior*, Lang, 2 *angustifolia* m."

C. aquatilis × *rigida*, not previously recorded from Britain, has been gathered on Glas Maol, on moor at head of Glen Fiagh, Clova, and near Kingshouse, Argyle. All seem sterile, at least in part.

C. Goodenowii × *rigida* is probable parentage of a plant from near Kingshouse, at about 2000 feet.

C. panicea, L., var. *intermedia* (Miégeville). A specimen from Fort William exactly resembles the Pyrenean form.

"*C. pelia*, O. F. Lang," found at Altnaharra in 1887, is referred by Herr Kükenthal to *panicea*, L., though the fruit shows resemblance to *C. livida.*

C. distans, L. Herr Kükenthal refers a dwarf plant from Inver Bay, near Tain, to var. *litoralis*, Anderrs.

C. fulva, Good. Mr. Marshall discusses what is the true value of the name, and concludes that *C. fulva*, Good., is mostly *C. flava* × *Hornschuchiana*, Hoppe, and that *Hornschuchiana* should be retained for the species, and *fulva* dropped, as Babington did.

C. Hornschuchiana × *Œderi*, gathered at Inveroran, Argyleshire, and near Conan in East Ross.

C. Œderi, Retz., is accepted in usual sense (not as understood by Bailey). Var. *œdocarpa*, Anderrs., was found in Glen Nevis, West Inverness.

C. rostrata × *vesicaria.* Sterile plants, referred to this hybrid, were gathered in Glen Callater, South Aberdeen, in 1886, and on Meall Ghaordie, Perthshire, at 2800 feet, in 1891.

C. vesicaria, L. Herr Kükenthal places *C. Grahami*, Boott,

from Glen Fiagh and from Kew Gardens, under this. Var. *alpigena*, Fr. To this he refers plants from the large bog on east side of Ben More, and from Glen Lyon side of Meall-nan-Tarmachan, both in Perthshire.

A New British Flora.—We are informed that the Rev. E. F. Linton is engaged in the preparation of a flora that will embody the results of the critical research so successfully applied by himself and others in recent years to British botany, but which is as yet scattered through scientific journals and reports. Such a work is much required, and Mr. Linton is exceptionally fitted to produce one of the right sort. It will be eagerly looked for and heartily welcomed.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1898.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

White Otters. By John Legge and J. E. Harting. *The Field*, 22nd January 1898, p. 124.—Two notes referring to specimens, amongst others, from Islay and Jura.

White Otters. By "Cavintable." *The Field*, 29th January 1898, p. 141.—A specimen obtained in Islay in June 1884.

White Otters. By Bruce Campbell. *The Field*, 29th January 1898, p. 141.—Refers to a specimen in a small museum near Taymouth Castle, Perthshire.

A Badger Colony in Dalmeny Park. By Charles Campbell. *Trans. Edin. Field Nat. and Micro. Soc.*, 1897, vol. iii. part vi. pp. 232-236.

Birds of Kintail, Ross-shire. By Archibald Craig. *Trans. Edin. Field Nat. and Micro. Soc.*, 1897, vol. iii. part vi. pp. 224-231.

The Upper Elf Loch, Braids. By Thomas Scott, F.L.S., and John Lindsay. *Trans. Edin. Field Nat. and Micro. Soc.*, 1897, vol. iii. part vi. pp. 276-287.—An interesting account of the fauna of this small loch, including the Protozoa, Cœlenterata, Annulosa, Rotifera, Entomostraca, Arachnida, Insecta, Mollusca, Fishes, and Amphibians.

Local Variation in Lepidoptera from the Orkneys. By C. G. Barrett, F.E.S. *Ent. Mo. Mag.* (2), vol. ix. p. 4 (January 1898).—The species dealt with are Nemeophila plantaginis, Agrotis

saucia, Noctua glareosa, N. festiva, var. borealis, Caradrina cubicularis, Hypsipetes elutata, Melanippe montanata, M. fluctuata, Coremia munitata, Cheimatobia brumata, Cidaria russata, and Crambus tristellus.

Venilia macularia in Scotland. By Robert Adkin. *Entomologist*, vol. xxxi. p. 19 (January 1898).—Refers to a long series from Sutherlandshire in the collection of Mr. W. Salvage.

Epione parallelaria in Scotland. Robert Adkin. *Entomologist*, vol. xxxi. p. 19 (January 1898).—Specimens are referred to from Invershin, Sutherlandshire, and from North Ross.

Epione parallelaria in Scotland. *Entomologist*, vol. xxxi. p. 66 (March 1898).—A note referring to two specimens in the collection of the South of Scotland Entomological and Natural History Society.

Notes on the Œstrine Parasites of British Deer. By Ernest E. Austen. *Ent. Mo. Mag.* (2), vol. ix. pp. 8-13 (January 1898).—A few references are given to the occurrence of species in Scotland.

Cephenomyia auribarbis, Mg.: Larvæ, etc. By the Rev. E. N. Bloomfield, M.A., F.E.S. *Ent. Mo. Mag.* (2), vol. ix. pp. 7-8 (January 1898).—An account of some larvæ taken from the heads of Red Deer from Strathdon and other places in Aberdeenshire.

Descriptions of three apparently new Copepods from the Clyde. By Thomas Scott, F.L.S. *Ann. and Mag. Nat. Hist.* (7), vol. i. pp. 185-190, plates X. and XI. (March 1898).—The species are Stephos Fultoni from Kilbrennan Sound and Loch Fyne, Eurynotus insolens from Kilbrennan Sound, and Dactylopus pectinatus from Loch Fyne.

On the Cretaceous Fossils found at Moreseat, Aberdeenshire. By A. J. Jukes-Browne and John Milne. *Geol. Mag.* (N.S.), Dec. IV. vol. v. pp. 21-32 (January 1898).—Comprises an account of previous investigations, and a Report on the Fossils, with a table of the species recorded.

BOTANY.

Botanical and other Notes (from neighbourhood of Coldingham). By James Hardy, LL.D. *Hist. Berw. Nat. Club*, 1897, xv. pp. 220-225.—Contains no specially new records.

List of Plants found at St. Abb's and vicinity in June 1896. By R. H. Dunn. *Hist. Berw. Nat. Club*, 1897, xv. p. 225.

List of Plants indigenous to Liddesdale District of Roxburghshire. By John Elliot. *Hist. Berw. Nat. Club*, 1897, xv. pp. 233-234), with a few mentioned by James Hardy, LL.D., in report of Club excursion (*l.c.* p. 231). List of plants observed on coast of Northumberland during excursion of Club, reported by Rev. George Gunn (*l.c.* p. 239).

On Primary Characters in Cerastium. By Frederick N. Williams, F.L.S. *Journ. Bot.*, 1898, pp. 8-10.

On Lycium barbarum, L., and L. europæum, L., and their Local Culture (in S.E. Scotland). By James Hardy, LL.D. *Hist. Berw. Nat. Club*, 1897, xv. pp. 362-364.

New Locality for Corallorhiza innata. By Rev. James Farquharson, LL.D. *Hist. Berw. Nat. Club*, 1897, xv. p. 363.—In Whitmuir Bog, on borders of Selkirkshire and Roxburghshire.

Blysmus rufus, var. bifolius, a New Plant for the District. *Hist. Berw. Nat. Club*, 1897, xv. p. 362.—Exhibited at Berwickshire Club meeting, in Berwick, from near Aberlady, by George Bolam.

The British Carex frigida. By Edward F. Linton, M.A. *Journ. Bot.*, 1898, pp. 41-44, plate 382A.—Discusses the identity of this plant, states reasons against its identification with *C. frigida*, All., concludes that it is very closely related to *C. binervis*, Sm., and proposes for it the name *C. binervis*, Sm., var. *Sadleri*.

The Distribution of British Mosses. By E. Charles Horrell. *Journ. Bot.*, 1898, pp. 60-62.

Memorials, Journal, and Botanical Correspondence of Charles Cardale Babington, M.A., F.R.S., etc. Reviewed in *Journ. Bot.*, 1898, pp. 33-35.—Botanists interested in the flora of Scotland will find in this work numerous references, especially to Braemar.

Further Observations on Excrescences and Diseases occasioned in Plants by Mites. By James Hardy, LL.D. *Hist. Berw. Nat. Club*, 1897, xv. pp. 354-355.—Enumerates galls on *Acer Pseudoplatanus*, **Lotus corniculatus*, **Epilobium palustre Veronica Chamædrys*, **Cytisus scoparius* (Broom), *Helianthemum vulgare*, and **Geranium molle*. [Those marked * appear not to have been previously recorded from Scotland.—J. W. H. T.]

Watson's Climatic Zones. By Symers M. Macvicar. *Journ. Bot.*, 1898, pp. 82-85.—Discusses the effect of altitude on plant distribution and its modification by local conditions.

Ranunculus petiolaris. By Rev. Edward S. Marshall. *Journ. Bot.*, 1898, p. 103.—Proposes (as the name *petiolaris* was pre-occupied by Humboldt and Kunth) to substitute *R. scoticus* as the name, if regarded as a species distinct from *R. Flammula*, L.

Notes on some British Sedges. By Rev. E. S. Marshall, M.A., F.L.S. *Journ. Bot.*, 1898, pp. 73-82, plate 383.—See p. 122. of this journal.

The British Carex frigida. By Arthur Bennett, F.L.S. *Journ. Bot.*, 1898, p. 103.—Supports Mr. Linton's determination of this as distinct from *C. frigida*, All., and possibly an endemic form.

Mastigophora Woodsii, (Hook.) Nees, in Inverness-shire. By Symers M. Macvicar. *Journ. Bot.*, 1898, pp. 103, 104.—Records this hepatic as found in some quantity at 500 and at 1200 feet altitude, in a ravine in Moidart.

Biographical Index of British and Irish Botanists. First Supplement. By James Britten, F.L.S., and G. S. Boulger, F.L.S. *Journ. Bot.*, 1898, pp. 99-103.—This supplement to the excellent book published under the above title five years ago, is to include all botanists that died in the years 1893-97, and a few omitted from the book. This instalment extends from Acton to Blomefield.

REVIEWS.

Wild Birds Protection Acts, 1880-1896. By J. R. V. Marchant, M.A. (Oxon.), of Gray's Inn, and Watkin Watkins, B.A. (Cantab.), of the Inner Temple, Member of the British Ornithologists' Union; both of the Oxford Circuit, Barristers-at-Law. Second Edition. (London: R. H. Porter, 1897.)

It is now eighteen years since the first of the Wild Birds Protection Acts now in force was passed. Since then three others have been grafted on to it, while almost each year has seen one or more Orders issued varying or extending the provisions of the Acts in some part of the country. To the complex body of law so created, Messrs. Marchant and Watkins have lately issued a welcome handbook, which has now reached its second edition, and which should be of the greatest assistance, not only to all who have the administration or enforcement of the Acts in their charge, but to all interested in the subject of wild bird protection. The book opens with a concise statement of what is the common law of England regarding wild animals and their capture, and a history of the legislation under which in that country the protection and preservation of game and other animals *feræ naturæ* has been cared for. Owing to material differences in the law of the two countries, however, these chapters of the book will be of more practical use in England than in Scotland. But in Chapter IV. we have a very careful analysis of the four recent statutes, which apply throughout Great Britain, showing precisely what acts are and what are not constituted offences under them. To legal practitioners this part of the book should prove of great assistance, while to ornithologists generally it will at least show that something yet remains to be done before the interests of our wild birds can be considered as adequately safeguarded. The text of the Acts follows, the various sections being arranged, as they are intended to be read, as if they formed one statute, so that the exact provisions of the law on each point can be seen at a glance. Copious notes are appended to the sections.

Finally, the text of all Orders issued since 1880, under which close-times have been varied or extended, or new birds brought within the provisions of the Acts, is given *in extenso;* and more useful still is an index, which shows under the heading of each bird the state of the law in any part of the kingdom regarding it. The handbook has been compiled with great care, and though the index will inevitably require revision from time to time, if it is to keep pace with the state of the law as new Orders are constantly issued, it should prove a valuable work of reference. W. B.

A Sketch of the Natural History (Vertebrates) of the British Islands. By F. G. Aflalo, F.R.G.S., F.Z.S. With illustrations. (Edinburgh: William Blackwood and Sons, 1898.)

It is very questionable, we think, whether it is possible to comprise in one small volume an account of all the British Vertebrates —about 700 in number. Mr. Aflalo has accomplished the task, in a fashion, in the book under consideration, but we cannot congratulate him on the result. Such a work, to be of real use, should be based upon some definite method of treatment, by which all the species would receive equal consideration; an accurate yet concise description of each species, a sketch of its distribution, and an outline of its life-history should be given. This book fails to fulfil these cardinal requirements, inasmuch as some species are rather fully dealt with, others inadequately treated; the descriptions of species are not, as a rule, good, and are sometimes ridiculous or inaccurate, as in the case of the Chaffinch and Sanderling; and the information as to distribution is faulty, as, for instance, when we are told that the Mountain Hare is "not uncommon in Yorkshire and Cheshire."

Although this book is disappointing, we cannot conclude this notice without some reference to Mr. Lodge's beautiful illustrations, which are both numerous and acceptable.

We have received from Mr. J. W. Tutt, F.E.S., a separate copy of his Presidential Address delivered before the members of the City of London Entomological and Natural History Society in December last. It bears the title "Some Considerations on the Nature and Origin of Species," and in it are discussed with much ability and clearness such subjects as hybridity, the origin of varieties and species, variation in genital organs, isolation, the effects of food and climate, sexual selection and the utility of specific characters. As might be expected, these branches of the subject are almost entirely treated of in their relation to Lepidoptera, but they are of interest and importance to others than specialists. The address is prefaced by a short review of the results of entomological work during the year, and here the author laments the stagnation of entomology in Scotland. This may be true as regards Lepidoptera, but as regards some other orders of insects we venture to assert that they are receiving a fair amount of attention.

The Annals
of
Scottish Natural History

No. 27] 1898 [July

EARLY MAN IN SCOTLAND.[1]

By Sir William Turner, D.C.L., LL.D., F.R.S.

In Scotland, as in other countries, man existed before the time of written history. The conditions under which his remains are found, and the works which he has left behind him, provide the data for determining their age, not absolutely or capable of being expressed in numbers of years, but relatively to each other.

Marked differences existed in the physical conditions of Scotland, and indeed in the northern parts of England also, as compared with the southern districts of England and the adjoining parts of France and Belgium at the first appearance of primeval man in those countries. It is the more necessary, therefore, that the conditions then prevailing in Scotland should not be overlooked.

No evidence sufficient to satisfy geologists has been advanced to prove that man existed in Britain during the period called Tertiary. So far, indeed, as Scotland is con-

[1] An Address delivered at the Royal Institution of Great Britain, on the 26th March 1897.

cerned, even if it were admitted that in other parts of the globe man had been on the earth during Tertiary times, there is little likelihood that his remains could have been preserved ; for in that country the Tertiary is represented chiefly by volcanic rocks, and a few patches of sand and gravel with rolled sea shells belonging to the closing stages of that period.

From the careful study which geologists have given to the surface of Scotland, it is evident that at the commencement of the period termed Quaternary or Pleistocene, immediately succeeding the Tertiary, the whole of the country was covered with ice which formed a great sheet 3000 or 4000 feet thick in the low grounds, of which the lower boulder clay, or till, as it is termed, was the ground-moraine.

As an upper boulder clay also occurs, which is often separated from the lower boulder clay by stratified deposits, some of which contain marine and other fresh-water and terrestrial organic remains, it is obvious that the Ice Age was not one uninterrupted period of continuous cold.[1] The lower and upper tills are the ground-moraines of independent ice sheets, each indicating a distinct epoch, separated by an interglacial period. The earlier epoch was that of maximum glaciation, and the ice sheet extended over the north and middle of England, as far south as the Thames valley and the foot of the Cotswold Hills, but the high moors in Derbyshire and Yorkshire and the tops of the highest mountains in Wales and Scotland rose above its surface. The great Mer de Glace stretched westward over Ireland into the Atlantic, whilst on the east it was continuous across the North Sea, with a similar ice sheet which covered Scandinavia and the region of the Baltic, and extended south to the foot of the hills of central Europe, and overspread much of the great central plain. In the extreme south of England, therefore, the conditions differed from those that obtained in the country farther north. Although not actually covered with a sheet of ice, yet the more

[1] For the evidence on which these statements are based, consult the "Great Ice Age," by Professor James Geikie, edition 1894, also his 'Classification of European Glacial Deposits,' in "Journal of Geology," vol. iii., April–May 1895.

southern counties had been of necessity under the influence of cold, and must have been subjected to the effects produced by rain and snow, by freezing and thawing.

During the succeeding interglacial epoch the climate eventually became temperate and genial, and vegetable and animal life abounded. It is to this stage that most of the Pleistocene river alluvia and cave deposits of England and the adjacent parts of the Continent are assigned. The British Islands appear at that time to have been joined to the Continent, and the same mammalian fauna then occupied Britain, France, and Belgium, which implied similar climatic conditions. As examples of these, it may be sufficient to name the larger mammals, as the cave and grizzly bear, the hyæna, lion, Irish deer, reindeer, hippopotamus, woolly rhinoceros, straight-tusked elephant and mammoth, all of which are now either locally or wholly extinct.

Abundant evidence exists that man was contemporaneous with these mammals in Western Europe, as is shown by the presence of his bones alongside of theirs, and of numerous works of his hands, more especially the implements and tools which he had manufactured and employed. To a large extent these consisted of flint, rudely chipped and fashioned. To these implements, and to the men who made them, the well-known term "Palæolithic" is applied. But along with these, other implements have been discovered, made from the bones, horns, and teeth of the larger mammals, on some of which animal forms and incidents of the chase have been sculptured both with taste and skill. Up to now, however, no trace of pottery which can without question be referred to Palæolithic men has been found, and no habitations, except the caves and rock shelters which nature provided for them.

One may now consider how far northwards in Britain Palæolithic man and the large mammals, with which he was contemporaneous, have been traced. The exploration of caverns made by Professor Boyd Dawkins, and other geologists associated with him, has proved that bones of certain of the mammals of this epoch were present in caves in Derbyshire, Yorkshire, and North Wales, and that human remains and implements of Palæolithic type have been

found along with them in the Robin Hood Cave in the Cresswell Crags, and in caverns in North and South Wales.

When Scotland is considered, evidence of the existence of the mammals of this epoch is not so abundant, yet the interglacial beds of that country have yielded remains of mammoth, reindeer, Irish elk, urus and horse. But notwithstanding the keen scrutiny to which the superficial deposits in Scotland have been subjected by the members of the Geological Survey and others, no traces either of the bones of Palæolithic man or of the work of his hands have been discovered in North Britain. This, indeed, is not much a matter of surprise, for it must be remembered that, subsequent to the genial interglacial epoch, another ice sheet, that of the upper boulder clay, made its appearance, grinding over the surface of the land, wearing away alluvia, and largely obliterating the relics of interglacial times. Hence interglacial beds occur only at intervals and are very fragmentary. Nor in Scotland are there any caves similar in dimensions to those which in England and elsewhere have yielded such abundant traces of Palæolithic man and his mammalian congeners. If Palæolithic man ever did exist in Scotland, and there is no reason why he might not have migrated northward from Yorkshire and Wales, yet one could hardly expect to discover traces of his former presence. In Scotland there are no massive limestones, with extensive caverns, in which man could have sheltered, and in which his relics and remains could have been secure from destruction during the advance of the second ice sheet. It is only in the alluvial deposits of interglacial times that such traces have been preserved, but these deposits, as we have seen, were ploughed out and to a great extent demolished by the later sheet of ice. The shreds that remain, however, are of extreme interest, from the fact that they contain relics of the Pleistocene mammals, with which Palæolithic man was contemporaneous ; and there is a bare chance that some day traces of man himself may be encountered in the same deposits.

Geologists have shown that in the regions which were overflowed by the second or minor ice sheet no traces of Palæolithic man, or of the southern mammals with which he was associated, have ever been met with in British superficial

alluvia. When found in those regions out of Scotland, they occurred in caves chiefly, and sometimes in the stratified deposits which here and there underlie the upper boulder clay and its accompanying gravels.

So far as Scotland is concerned, one must look for a period subsequent to the melting of the second great ice sheet for evidence of the existence of early man. After its disappearance important fluctuations in temperature and in the relative level of land and sea took place from time to time, so that the climate and the area of land in Scotland differed in some measure from what is known at the present day. Eventually a period of cold again occurred, not so severe, undoubtedly, as in the two preceding glacial epochs, but sufficient to bring into existence considerable district ice sheets and extensive valley-glaciers in the Highlands and Southern Uplands. Scotland at this stage was partially submerged, and many of the Highland glaciers reached the sea and gave orgin to icebergs. The submergence slightly exceeded 100 feet, and the marine deposits formed at the time are charged with arctic shells and many erratic blocks and débris of rocks. On a subsequent elevation of the land, the beach formed at this level constituted a terrace, well marked on the coast line in many districts, and now known as the 100-foot beach.

There is good reason to believe that the elevation referred to was of sufficient extent to join Britain again to the Continent. It is to this stage that the great timber trees which underlie the old peat bogs of Scotland are referred. The peat with its underlying forest bed passes out to sea, and is overlaid in the carse lands of the Tay and the Forth by marine deposits, which form another well-marked terrace, the 45-50 foot raised beach of geologists.

Thus the elevation of the land that followed after the formation of the 100-foot beach coincided with an amelioration of climate and with the presence of an abundant vegetation, and large mammals, such as the red-deer, the elk, and the *Bos primigenius* roamed through the woods. While these conditions obtained partial submergence again ensued, and the sea rose to 50 feet, or thereabouts, above its present level. Within recent years it has been shown that

during this period of partial submergence glaciers reached the sea in certain Highland firths, which would seem to show that the climate was hardly so genial as during the preceding continental condition of the British area, when that region was clothed with great forests. Ere long, however, elevation once more supervened, and the sea retreated to a lower level. Here it paused for some time, and so another well-marked terrace was formed, that which is known as the 25-30 foot beach.

There is not any evidence of the presence of man in Scotland during the formation of the 100-foot beach or terrace, but one can speak with certainty of his presence there during the period of formation of the later beaches. If one could put oneself into the position of an observer, who at the time of the 40-50 foot submergence had stood on the rock on which Stirling Castle is now built, instead of the present carse lands growing abundant grass and grain, and studded with towns, villages, and farm-houses, one would have seen a great arm of the sea extending almost if not quite across the country from east to west, and separating the land south of the Forth from that to the north. In this sea great whales and other marine animals disported themselves, and sought for their food. Abundant evidence that this was the condition at that time in the Carse of Stirling is furnished by the discovery during the present century of no fewer than twelve skeletons of whalebone whales, belonging to the genus Balænoptera or Finner whales, imbedded in the deposit of mud, blue silt, and clay which formed the bed of the estuary.[1] This carse clay, as it is called, is now in places from 45-50 feet above the present high-water mark, and is extensively used for the manufacture of bricks and tiles. At a still lower level lies the carse clay of the 25-30 foot terrace. Until the beginning of the present century the clay had been covered by an extensive peat moss, which the proprietors of the land have removed. The question which has now to be considered is—Did man exist in Scotland at the period of the formation of the carse clays and of the

[1] See more particularly Mr. Milne Home's "Ancient Water Lines" (Edinburgh, 1882), and "The Raised Beaches of the Forth Valley," by D. B. Morris (Stirling, 1892).

two lower sea beaches? There is undoubted evidence that he did.

Along the margin of the 45-50 foot terrace in the neighbourhood of Falkirk one comes upon the shell-mounds and kitchen-middens of Neolithic man. All these occur on or at the base of the bluffs which overlook the carse lands —or, in other words, upon the old sea-coast. Again, in the Carse of Gowrie, a dug-out canoe was seen at the very base of the deposits, and immediately above the buried forest-bed of the Tay valley. The 25-30 foot beach has been excavated out of the 40-50 foot terrace; it is largely a plain of erosion rather than of accumulation. It is probable, therefore, that many of the relics of man and his congeners which have been obtained at certain depths in the 25-30 foot beach may really belong to the period of the 40-50 foot beach. Some of these finds will now be referred to.

In 1819 the bones of a great whale, estimated at about 72 feet long, were exposed in the carse land adjoining the gate leading into the grounds of Airthrey Castle, near Bridge of Allan, about 25 feet above the level of high water of spring tides. Two pieces of stag's horn, through one of which a hole about an inch in diameter had been bored, were found close to the skeleton. In 1824, on the estate of Blair Drummond, in the district of Menteith, a whale's skeleton was exposed, and along with it a fragment of a stag's horn which was said to have a hole in it and to have been like that found along with the Airthrey whale. Mr. Home Drummond also states that a small piece of wood was present in the hole, which fitted it, but on drying, shrunk considerably. Unfortunately, these specimens have been lost, and no drawings or more detailed descriptions were ever apparently published, though in some geological and archæological works they have been stated, without any authority, to have been lances or harpoons. Twenty years ago the skeleton of another whale was exposed at Meikle-wood, Gargunnock, a few miles to the west of Stirling, and resting upon the front of its skull was a portion of the beam of the antler of a red deer, fashioned into an implement eleven inches long, and six and a half inches in greatest

girth; a hole had been bored through the beam, in which was a piece of wood one inch and three-quarters long, apparently the remains of a handle. The implement was truncated at one end, and shaped so that it could have been used as a hammer, whilst the opposite end was smooth and bevelled to a chisel or axe-shaped edge formed by the hard external part of the antler.[1] There can be no doubt that this implement resembled those found alongside of the Airthrey and Blair Drummond whales earlier in the century, and it effectually disposes of the statement that they were lances or harpoons. Dug-out canoes have indeed been found imbedded in the carse clays at a similar level, so that the people of that day had discovered a means of chasing the whale in the water; one can, however, scarcely conceive it possible to manufacture a horn implement sufficient to penetrate the tough skin and blubber of one of these huge animals, and to hold it in its efforts to escape. It is much more probable that the whale had been stranded at the ebb of the tide in the shallower water near the shore, and that the people had descended from the neighbouring heights, and had used their horn implements, with their chisel-like edges, to flense the carcase of its load of flesh and blubber, and had carried the spoil to their respective habitations. There can be little doubt that these implements rank, along with the dug-out canoes, as the oldest relics made with human hands which have up to this time been found in Scotland, and that they belong to the earliest period of occupation by Neolithic man.

After the oscillations in the relative level of land and sea had ceased, and the beach found at the present day had been formed, evidence of the presence of Neolithic man, and of mammals, both wild and domesticated, such as now exist in Scotland, becomes greatly multiplied.

Shallow caves or rock shelters situated in the cliff which bounds the esplanade at Oban Bay, which, after being closed for centuries by a landslide from the adjacent height, had recently been quarried into in obtaining stone for building

[1] I described this implement in "Reports of British Association, 1889," p. 790. has subsequently been figured in a Report by Dr. Munro in the "Proceedings the Society of Antiquaries," 1896.

purposes, were described in the lecture.[1] The caves were, as a rule, 100 yards inland, and about 30 feet or more above the present high-water mark. They had, no doubt, been formed by the action of the waves at the period of formation of the 25-30 foot beach, for the floor of one of the caves was covered by a layer of gravel and pebbles, which had been washed there when the sea had had access to it.

In these caves, bones representing fifteen human skeletons—men, women, and children—were found; also bones of the *Bos longifrons*, red and roe deer, pig, dog, goat, badger, and otter, shells of edible molluscs, bones of fish and claws of crabs; also flint scrapers, hammer stones, implements of bone and horn fashioned into the form of pins, borers, and chisel-shaped instruments. In one cave several harpoons or fish spears made of the horns of deer were obtained; similar in form to those found in the Victoria Cave, Settle, in Kent's Cavern, and in the grotto of La Madelaine, France, which in some of these instances have been associated with Palæolithic objects.

An account was then given of the construction and contents of the chambered horned cairns in Caithness and the north-west of Scotland, which have been so carefully investigated and described by Dr. Joseph Anderson.[2] The presence of incinerated bones and of unburnt skeletons showed the cairns to have been places of interment, whilst flint flakes and scrapers, bone and polished stone implements, and shallow vessels of coarse clay, associated them with Neolithic man, obviously the same race as the builders of the English long barrows.

Stone abounds in Scotland, and the polished stone implements, which have been found in every county, in the soil and near the surface of the ground, are often of large size and beautifully ground and polished. Flint, on the other hand, is confined to a few localities, as the island of Mull and limited areas in the counties of Banff and Aberdeen. The nodules are as a rule small in size, and though adapted

[1] For a detailed description, see papers by Dr. Joseph Anderson and the Author in "Proc. Scot. Soc. Antiquaries," 1895.

[2] "Scotland in Pagan Times" (Edinburgh, 1886).

for the manufacture of arrow-heads and scrapers, flint does not seem to have attained the same importance in Scotland as the raw material provided by nature for the manufacture of articles used by Neolithic man, as was the case in England and Ireland.

Although there is ample evidence of the nature of the implements and weapons manufactured by Neolithic man, and of his methods of interment in rock shelters and chambered cairns, no traces of built dwellings which can be ascribed to the people of this period have been discovered. Doubtless their habitations were constructed of loose stones and turf, and sun-dried clay, or of the skins of animals killed in the chase spread over the branches of trees, which, from their fragile and destructible character, have not been preserved.

In the course of time stone and bone, readily procurable, and which are directly provided by nature for the use of man, gave place to materials which required for their manufacture considerable skill and knowledge. The introduction of bronze as a substance out of which useful articles could be made, marked an important step in human development, and could only take place after men had learnt by observation the ores of copper and tin, and by experiment the methods of extracting the metals from them, and the proportions in which they should be combined in the alloy in order to secure the necessary hardness. So far as Scotland is concerned, bronze must have been introduced from without; its manufacture could not have been of indigenous development, as the ores of tin and copper do not occur in North Britain. Doubtless it came from the southern part of our island, and was extensively employed in South Britain long before it became substituted in the north for the more primitive materials.

There is abundant information that Scotland had a Bronze Age. Swords, spears, bucklers, bracelets, rings, fish-hooks, axes, chisels, sickles, and other implements made of this metal have been found in considerable numbers. These objects occur sometimes singly, at others in collections or hoards in peat mosses, or even at the bottom of lochs and rivers, or buried in the soil as if they had been placed there with a view to concealment, and then, through the death or

removal of their owners, had been lost sight of. In many instances these weapons and implements are elegant in design, show great mechanical ability in their construction, and are ornamented with much taste and skill. Instances also are not uncommon in which objects of bronze are found in the sepulchres of the period.

In the study of the Bronze Age in Scotland a want is experienced similar to that felt in a review of the Neolithic period. There are no buildings which can be distinctly regarded as dwelling-places for the men of this time. With them, however, as in the polished Stone Age, there is evidence of the mode in which they disposed of their dead friends and relatives. Interments which there are good grounds for associating with these people have been exposed in the formation of roads and railways, and in agricultural operations. Where the surface of the ground has not been cultivated or otherwise disturbed, in almost every county tumuli, mounds, hillocks, and cairns occur, the exploration of which has in many cases yielded interesting results. In no instance, however, have chambered cairns, divided into compartments, and possessing an entrance passage, been found associated with articles made of bronze. The sepulchral arrangements of the period possessed a greater simplicity than is shown in the chambered cairn.

The interments in the Bronze Age were sometimes that of a single individual in a knoll or mound, or under a cairn artificially constructed, and now overgrown with grass, heather, and whin bushes, or, as is not uncommon, in the collection of sand or gravel near the sea shore, or on a river bank, or in the moraine of some long-vanished glacier. At other times, in similar localities, two to six interments had been made as if in a family burying-ground. At others the interments were much more numerous, and represented, doubtless, the cemetery of a tribe or clan; one of the best known of these was observed some years ago at Law Park, near St. Andrews, in which about twenty interments were recognised. In another at Alloa, twenty-two separate interments were exposed. Quite recently, immediately to the east of Edinburgh, in the districts now known as Inveresk and Musselburgh, not less than fifty interments of this

period have been brought to light, in connection with building operations, which implies that then, as now, this part of the country was settled and had a considerable population.

Two very distinct types of interment prevailed, viz. Cremation, with, or without cinerary urns; and Inhumation, the unburnt body being enclosed in a stone cist or coffin. From an analysis of 144 localities in Scotland of burials which may be associated with the Bronze Age,[1] and which included about 400 distinct interments, it would appear that in fifty-one of these localities the bodies had all been cremated; in sixty they had been buried in stone cists; in fifteen the same mound or cemetery furnished examples of both kinds of sepulchre, and in the rest the kind of interment was not precisely recorded. These diversities did not express tribal differences, but seemed to have prevailed generally throughout Scotland. Both cremation and inhumation are found in counties so remote from each other as Sutherland in the north, and Wigtown in the south, in Fife and the Lothians on the east, and in Argyle and the distant Hebrides in the west, as well as in the intermediate districts.

The cremation had been affected by wood fires, for in many localities charcoal has been found in considerable quantity at the place of interment. The heat generated was sufficient to reduce the body to ashes, and to burn the organic matter out of the bones, which fell into grayish-white fragments, often curiously cracked and contorted, which were not very friable. They were then collected and usually placed in an urn of a form and size which we now call "cinerary." When a bank of sand or gravel was convenient, a hole three or four feet deep was made and the urn lodged in it. Sometimes the urn stood erect and a flat stone was placed across the mouth before the hole was filled in with sand and earth; at others a bed of compacted earth, or of small stones, or of a flat stone, was made at the bottom of the hole, and the urn, with its contents, was inverted. In some cases the urn was protected by loose stones arranged around it. In

[1] Most of these are recorded in the "Archæologica Scotica," the "Proceedings of the Scottish Society of Antiquaries," and Dr. Joseph Anderson's "Scotland in Pagan Times"; whilst others, in the Author's note books, have not yet been published.

obviously exceptional instances, it may be perhaps of a tribal chieftain, a small stone cist was built to enclose the urn, and even a cairn of stones was piled above and around to protect it and to mark the spot.

Cremated interments not contained in urns have been recorded in a few instances, and in them the surrounding sand or gravel has usually been discoloured, from the blackened remains and charcoal having to some extent become diffused through it.

The largest examples of cinerary urns were from 12 to 16 inches in height, with a flat narrow bottom, and 10 to 12 inches wide at the mouth. About one-third the distance below the mouth the urn swelled out to its widest diameter, and was surrounded by one or two mouldings, between which and the mouth the outer surface was often decorated with lines which ran horizontally, or vertically, or obliquely; sometimes they intersected and formed a chevron or a diamond-shaped pattern. Below the mouldings, the surface was without pattern, though sometimes raised into an additional simple circular moulding.

When the inhumation of an unburnt body was decided on, a rude cist or coffin, formed of undressed flattened stones, was built for its reception. As a rule the sides and ends of the cist were formed each of a single slab of sandstone, schist, gneiss, granite, or other stones provided by the rock in the neighbourhood; but in some instances of a stone of a different character from the adjoining rocks, and obviously brought from a distance. The stones were set on edge and supported a great slab, which being laid horizontally formed the lid or cover of the cist, and which was much thicker and heavier than the side and end stones; sometimes, as if for additional protection, a second massive slab was placed on the top of the proper cover. The floor of the cist was formed, when the earth was shallow, of the native rock, and at other times of compacted earth, or a layer of pebbles, or of flat stones. Usually the stone walls and the cover of the cist were simply in apposition, but sometimes they were cemented together with clay. In some cists exposed a few years ago on the farm of Cousland, near Dalkeith, the peculiarity was observed of the cist being

divided in its long direction into two by a stone slab down the middle.

The cists were oblong, the length exceeding the breadth, and although they varied in size, those for adults being larger than those for children, they were always shorter than would have been required for a body to be extended at full length. As the end stones were usually set within the extremities of the side stones, the internal measurement of length was some inches less than the external. The average dimensions may be given for the interior about 4 feet in length, 2 feet in breadth, and 2 feet in depth. The cover slab was much larger both in length and breadth, as it overlapped both the sides and ends.

These cists remind one in their general form and plan, but on a much smaller scale, both as regards the size of the enclosed space and the magnitude of the stones, of the dolmens so frequent in Brittany. As survivals in modern times we may point to the empty stone boxes, on the cover stone of which an inscription is incised, to be seen in so many country churchyards, built on the ground superficial to the pit in which the body in its wooden coffin has been inhumed.

Owing to the shortness of the cist the body could not be extended at full length, but was laid upon its side, with the elbows bent, so that the hands were close to the face ; the hips and knee joints were also bent so that the knees were in front of the body.

Usually only a single skeleton has been found in a cist, either a man or a woman as the case may be. Sometimes two skeletons have been seen, at times a man's and a woman's, doubtless husband and wife ; in others the second skeleton has been that of a child. Sometimes the cist was below the average in size, and contained only the skeleton of a child or young person. Such examples throw light upon the family relations of the people of this period. They show that they desired to preserve the associations of kinsfolk even after death ; and when the cist contained the remains only of a child it was constructed with the same care as if it had been the tomb of a chief.

When cremated bodies are found associated with stone

cists in the same cemetery, the cinerary urns in which the ashes were customarily deposited lie outside the cists, and in quite independent excavations in the soil, but in such close proximity as to show that they belonged to the same period. In two instances short cists have been opened, in which, alongside of the skeleton of an unburnt body were cremated human bones, not contained in a cinerary urn, but scattered on the floor of the cist, which conclusively prove that both cremation and inhumation were sometimes in practice at the same interment.

One may now inquire into the reason why cinerary urns, with their contained ashes, and short cists, enclosing bodies which had been buried in a bent or stooping attitude, should be associated with the men of the Bronze Age. The first and most important is the presence of objects made of bronze. In the 144 localities under analysis in which interments ascribed to the Bronze Age have been examined, bronze articles were found in 34 directly associated with the interments. In four of these the bronze was along with objects made of gold. In seven other interments of the same character gold ornaments without bronze were present. The men of this period were, therefore, workers in gold also, and as it has been, and indeed still can be, mined in Scotland, it is not unlikely that the ornaments had been wrought from native metal. Additional proof that the burials in short cists, and after cremation in cinerary urns, both belonged to the same period, and were practised by the same people, is furnished by the presence of articles of bronze and gold in both groups of interment.

But, in addition to metallic objects, the graves sometimes contained other implements and ornaments. In many localities articles made of flint, stone, or bone, and jet beads were associated with bronze. In others flints in the form of chips, knives, arrow-heads, and spear-heads; stone implements in the form of whetstones and hammers; bone and jet ornaments and bone pins were found in short cists, and some of these articles, also in cremation interments, were unaccompanied by bronze.

Attention has been called by Dr. Joseph Anderson to the character of the bronze objects usually associated with

these burials.[1] For the most part they have been thin blades, leaf-like or triangular in form, and either with or without a tang for the attachment of a handle. From their shape they might have been used as spear-heads, daggers, or knives. Not unfrequently the surfaces of the blade were ornamented with a punctated or incised pattern. Sometimes bronze pins, rings, and bracelets have been obtained from these interments. It should, however, be stated that the bronze articles and ornaments of gold found in association with the burials are of a more simple character, and present less variety in form, purpose, and decoration than those which have been got in hoards in various parts of Scotland. It would seem, therefore, as if the people of this period, even if they were in possession of such finished and beautifully decorated swords, bucklers, axes, and bronze vessels as have been got in the hoards just referred to, did not deposit them in the graves of their deceased friends and relatives. It may be, however, that the simpler articles found in the interments represent a period in the Bronze Age earlier than that in which the art of making the more elaborate articles had been acquired, when perhaps the custom of depositing grave goods had been more or less departed from.

Cinerary urns are not the only utensils formed of baked clay to which the term urn has been applied, and archæologists recognise by the names of "incense cups," "food vessels," and "drinking cups" three other varieties.

The examples of so-called incense cups are not numerous in Scotland; they were associated with cremation interments and have usually been contained in cinerary urns; they are the smallest of all the varieties of urn, and are as a rule from 2 to 3 inches high, and about 3 inches wide. In one specimen from Genoch, Ayrshire, the cup possessed a movable lid. Not unfrequently the outer surface was patterned with horizontal, vertical, and zig-zag arrangements of lines. In a few cases the sides were perforated as if to allow the escape of fumes, and it is probably from this character, as well as from their small size which fitted them for being easily carried in the hand, that they have been termed incense cups. The burning of incense would, however, imply, on the part of the

[1] "Scotland in Pagan Times."

people of the Bronze Age, the possession of fragrant gums and resins such as are not indigenous to Britain, and which the ancient Caledonians were not at all likely to be in a position to procure. In most instances the contents of these cups were not preserved by the finders. An example, which was discovered in 1857 at Craig Dhu, North Queensferry, covered by a larger urn, and about the size of a teacup, was filled with calcined human bones; the specimen from Genoch, found a number of years ago by Dr. James Macdonald, of Ayr, contained the burnt bones and ashes of a child in its fifth or sixth year. Of the conflicting theories as to the purpose to which these cups were applied, the view that, like the large urns with which they were associated, they were cinerary, and were intended for the reception of the ashes of an infant or young child, seems the most probable.

Numerous examples of the variety of urn termed "food vessel" have been found in Scotland, and "drinking cups," although not quite so numerous, are fairly represented. In the 144 localities under analysis the bowl-shaped food urns were found in 31, drinking cups in 25, and in seven instances the size and form of the urn is not stated with sufficient precision. With a few exceptions, in which the character of the burial had not been fully described, the urns were contained in short cists, in which also the skeleton of an unburnt body in the bent or contracted position, was lying. In several instances it is stated that the urn, either food or drinking vessel, contained black dust, or earth, or greasy matter, but burnt bones are never said to constitute their contents. Not unfrequently, although this is not an invariable rule, the urn was placed in proximity to the head and raised hands of the skeleton.

These varieties of urn are by no means invariably present in short cists. In twenty-five localities where this kind of grave was seen, there is no record of either form of urn being present. It is obvious therefore that, though associated with so many inhumation interments, they were not regarded as necessary accompaniments, and they obviously discharged in the minds of the people of the time a different function from that of cinerary urns. The term food-urns applied to the bowl-shaped variety is probably appropriate, as indicating

that edible substances were placed in them, in the belief that food should be provided for the use of the corpse. It is questionable, however, if the taller variety were drinking cups, as the unglazed clay would not fit them for the retention of liquids for any length of time. Their presence in the stone cists, along with, in some instances, implements and weapons, would point to the belief, in the minds of those practising this form of interment, in a resurrection of the body, and a restoration to the wants and habits of the previous life. It may be that placing the body in the crouching position, lying on one side, was regarded as the attitude best fitted, when the proper time came, to enable it to spring into the erect position and assume an active state of existence. The practice of cremation, however, to an almost equal extent as inhumation, by people of the same period, shows that they may not all have shared in the belief in a corporeal resurrection. But it should not be forgotten that, even in many cremation interments, blades and other objects made of bronze have been found along with the burnt bones and cinerary urns, as if for use in a future life.

(*To be continued.*)

THE PROTECTION OF WILD BIRDS AND THEIR EGGS IN SCOTLAND.

THANKS to the courtesy of Lord Balfour of Burleigh, Her Majesty's Secretary for Scotland, we are enabled to reproduce, for the benefit of our readers, certain documents which have lately been issued from the Scottish Office, and which should have an important bearing upon the future administration of the Wild Birds Acts in Northern Britain.

Herein a scheme is suggested for adoption, which is so comprehensive and concise, and the general tenor of the Circular wherein it is propounded so excellent, that it demands little or no introduction or commentary at our hands. Indeed, it is admirably prefaced by a letter from Lord Balfour's pen addressed to the conveners of County

Councils, to all of whom, along with the Circular and Lists of Birds, it has already been transmitted.

A retrospect of the working of the Act of 1894 must convince every one that such a scheme as that now proposed is a great desideratum. The want of such a "plan of action," if we may so term it, in the past has resulted in so many anomalies that confidence in the Act has been shaken and its wisdom even doubted.

The most serious of these defects are of a fundamental nature. Thus we find that counties in which the conditions of bird life and the requirements of protection are identical have elected to protect few species in common; that many of the birds scheduled are not species really in need of protection; that the birds which should be protected are often conspicuous by their absence from the schedules; and, lastly, that certain counties have actually applied the benefits of the Act to the eggs of birds which do not breed in the British Islands! It is true that by a judicious exercise of censorship some of these shortcomings and absurdities have fortunately been remedied; but there are naturally limits to the application of such censorship.

It is essential that the Local Authority should realise what species actually require protection within the area under its jurisdiction. Certain County Councils—alas only a few—have either possessed this necessary knowledge, or, if they did not, have wisely consulted specialists; and in these cases the result has been all that could be desired.

We fully realise, however, the fact—and we desire to be very emphatic upon this point—that the intention of the Local Authority has always been excellent and well-meaning, and prompted solely by a desire to do the best for the community; and if these good intentions have failed it is not the fault, but rather the misfortune, of the promoters.

It is the very laudable desire to remove these existing anomalies, and to secure the maximum of benefit that the Acts are capable of affording, that has led Lord Balfour to propound his carefully thought-out scheme, and to offer sound advice as to what species should be protected generally and in the two districts into which Scotland is proposed to be subdivided.

The scheme, and the lists of species enumerated for protection under it, have received our careful consideration and critical examination, and in our opinion it is well-considered, practical, and highly beneficial in its aims, and leaves little or nothing to be desired.

As naturalists, we extend to it our hearty approval. We recognise its merits, and desire to express to His Lordship our high appreciation of his enlightened action, which should place Scotland *facile princeps* in the matter of the administration of our Wild Birds Acts. We cordially recommend the adoption of the scheme *en bloc* by the County Councils of Scotland; and we trust that those who have influence in County matters will use their suasion in its favour.

At first we were inclined to advocate the adoption of a larger number of natural areas, instead of the two here propounded, but confess that we are now converts to the smaller number, which, among other things, has simplicity on its side—a most desirable and all-important recommendation.

The following are the documents to which we have referred :—

[*Letter to the Conveners of County Councils.*]

SCOTTISH OFFICE,
WHITEHALL, S.W., *29th April* 1898.

Dear Sir,—I enclose a copy of a circular letter which has been sent from this office to the Clerk of your County Council on the subject of the Protection of Wild Birds.

I hope the policy indicated and the considerations on which that policy is based will commend themselves to your judgment, and that you will confer the favour upon me of taking a personal interest in the matter, and will bring it before your Council on an early date.

The lists of birds now suggested have been most carefully considered in this office, the existing orders have been examined, and as few changes made as will suffice to secure uniformity over the areas selected. The best ornithological advice open to us has been consulted, and I venture to hope the result will prove satisfactory to you and to your Council.

I will only add, that, if there are any points in our circular letter which may not, at first sight, appear quite

clear to you, I shall be willing to give you any further information or explanation you may desire. I am personally most anxious, with your kind co-operation, to give the proposed scheme a fair and reasonable trial, say for four or five years, because I believe it is in this way that the administration of these protective Acts can be made to show the most satisfactory results.—I am, dear Sir, etc.,

BALFOUR OF BURLEIGH.

Circular No. 287.

WILD BIRDS PROTECTION ACTS.

SCOTTISH OFFICE,
WHITEHALL, S.W., 18*th April* 1898.

Sir,—With reference to previous correspondence, including the circular letter of the 2nd November 1894, No. 204, addressed to you from this office, I am directed to request that you will call the attention of the County Council of to the present mode in which the Wild Birds Protection Acts are being administered, with a view of considering whether it would not be advantageous to adopt a general scheme under which Scotland should be divided into districts, consisting of groups of Counties, so as to enable the Secretary for Scotland, upon application by the Council of any County, to grant an Order bringing the County within a particular group.

2. The powers conferred by the Wild Birds Protection Acts, 1880-96, bearing directly on the question, may be briefly summarised as follows:—

(*a*) The provision in the Act of 1880 for the extension or variation of the close-time for all wild birds by order of the Secretary for Scotland upon the application of County Councils.

(*b*) The provisions in the Act of 1894 enabling the Secretary for Scotland, upon the application of County Councils, to grant Orders prohibiting the taking and destroying of the eggs of wild birds throughout the whole County, and of the eggs of any specified birds within particular areas, and also for adding further species of birds to the schedule of the Act of 1880.

(*c*) The provision in the Act of 1896 enabling the Secretary for Scotland to grant Orders, upon the application of the County Councils, for the extension of the close-time for particular kinds of birds, or for all wild birds in particular places.

3. I am to point out that an Order under (*a*) extending the close-time in Shetland has been issued by the Secretary for Scotland, but, with this exception, all the Orders made upon the application of County Councils have been under (*b*) of the aforesaid provisions. The administrative area for the purpose of these Orders, with one exception, has always been the County.

4. It appears to His Lordship that the larger the area within which identical Orders can be made applicable the easier it will be found to administer the law, because all concerned can more readily make themselves acquainted with the provisions of the Orders in force for the protection of birds and their eggs. But, with the exception of the Counties of Dumfries, Kirkcudbright, and Wigtown, in which an identical list of protected birds is now in force, there has hitherto been a complete want of uniformity in the Orders applied for even by adjoining Counties.

5. Lord Balfour of Burleigh has accordingly been led to consider whether it might not be desirable to form districts and to frame a model list of birds for each district which would meet the case of a larger number of Counties than it seems probable could by any other means be found working in co-operation.

6. As the result of a careful consideration of the whole subject both from the administrative and the ornithological point of view, and in the light of the experience gained in the past four years, the Secretary for Scotland has come to the conclusion that the best plan to secure a really effective administration of these Acts would be to divide Scotland into two districts, Northern and Southern, in the manner indicated by the red line on the accompanying map (Appendix II.).

7. Following upon this the Secretary for Scotland has considered what birds are in need of special protection, and is advised that the list, of which a copy (Appendix I.) is annexed, comprises all the birds which it is needful to protect in the Northern and Southern districts respectively.

8. The list shows (1) what birds should receive protection in both districts; (2) what additional birds should be protected in the Northern district; and (3) what additional birds should be protected in the Southern district, by Orders under the Act of 1894.

9. It is obvious that although certain rare or local species do not breed in all the Counties of one or the other of the districts, yet from the fact that they breed, in most instances, in Counties not far removed, it is suggested that it would be expedient to protect them in all the Counties of the district, in the hope that under such combined protection they may possibly become more numerous and extend their range. This course would prevent their being killed during their visits to Counties which are not far removed from their breeding areas. And there is the additional reason already indicated that the larger the area over which one uniform Order can be put in force the

less excuse there will be for any individual who has not made himself acquainted with it.

10. The birds in the annexed list whose eggs are mentioned for protection under the Act of 1894, and which are not already scheduled, would, under the scheme, be added to the schedule of the Act of 1880, in order to afford them protection during the breeding season. It should be borne in mind that the Act of 1881 adds the Lark to the schedule of the Act of 1880. It is further suggested that certain birds marked * in the list should receive protection all the year round, under section 1 of the Act of 1896.

11. The protection of certain small birds in the vicinity of towns has not been lost sight of, but, if the necessity for such protection should arise, it can best be given by special Orders under the Wild Birds Protection Act, 1894.

12. In conclusion, I am to request that you will be so good as to lay this communication before the County Council at their next meeting for their careful consideration, so that if the scheme meets with their approval they may be in a position to apply for Orders in accordance therewith, before the end of the period covered by existing Orders, which, in the great majority of cases, expire on the 31st December 1898.—I am, Sir, your obedient Servant,

COLIN SCOTT MONCRIEFF.

WILD BIRDS PROTECTION ACTS.

Appendix 1 *to Scottish Office Circular, No.* 287, *of* 18*th April* 1898.

I.—DISTRICTS (*see Map Appendix* II.[1]).

(1) *Northern District.*

Orkney	Ross and Cromarty	Banff	Perth
Shetland	Inverness	Aberdeen	Argyll
Caithness	Nairn	Kincardine	Bute
Sutherland	Elgin	Forfar	

(2) *Southern District.*

Fife	Renfrew	Berwick	Dumfries
Kinross	Lanark	Selkirk	Kirkcudbright
Clackmannan	Linlithgow	Peebles	Wigtown
Stirling	Edinburgh	Roxburgh	
Dumbarton	Haddington	Ayr	

[1] We have not thought it necessary to reproduce the map.—EDS.

II.—List of Birds requiring Protection.

1. In both Districts.	2. In Northern District only.	3. In Southern District only.
Bullfinch	Diver, Black-throated	Dipper
*Buzzard	Diver, Red-throated	Gull, Common
*Chough	*Eagle, Golden	Hawfinch
Crossbill	*Eagle, Sea	Merlin
*Dotterel	Gray Lag Goose	Oyster Catcher
Eider Duck	Greenshank	Plover, Golden
*Goldfinch	Hen Harrier	Plover, Ringed
*Great-crested Grebe	*Kite	Raven
Jay	Pintail Duck	Sheld Duck
*Kestrel	Phalarope, Red-necked	Siskin
*Kingfisher	Scoter	*Woodpecker, Great Spotted
Lapwing (after 15th April)	Skua, Great	
Mallard	Skua, Richardson's	
Night Jar	*Titmouse, Crested	
*Osprey	Whimbrel	
*Owl, Barn		
*Owl, Long-eared		
*Owl, Short-eared		
*Owl, Tawny		
*Peregrine Falcon		
Pochard		
Quail		
Shoveller		
Skylark		
Snipe		
Teal		
Tern, Common		
Tern, Little		
Tern, Sandwich		
Tufted Duck		
Wigeon		
Woodcock		

32 + 15 = 47 species in Northern District.
32 + 11 = 43 species in Southern District.

Being a total of 58 Birds, whereof

32 occur in both lists,
15 ,, ,, North only,
11 ,, ,, South only.

Note.—In the case of the birds marked * it is suggested that (irrespective of Districts) the close-time under the Act of 1880 should be extended by an order under section 1 of the Act of 1896.

In conclusion, we would remark that it has been repeatedly said that it is nobody's business to put the Acts in motion against offenders. May we not look to the two powerful societies—The Society for the Protection of Birds, and the Selborne Society—for help in this matter? W. E. C.

ON BIRDS OBSERVED IN THE ISLAND OF TIREE.

By Peter Anderson.

The following notes relate to one hundred and twenty-eight species of birds which have come under my notice during twelve years of residence in the island.

In addition to these, I have from time to time seen birds which I was unable to identify. These latter were chiefly small arboreal species which visit us during the seasons of migration, and which do not remain long here, for there is neither tree nor bush on the island.

Missel Thrush, *Turdus viscivorous.*—Not uncommon in late autumn, winter, and spring. It is generally seen singly or in twos or threes. They frequent grassy fields, and take shelter by the side of old walls and rocks during stormy weather.

Song Thrush, *Turdus musicus.*—A regular winter visitor in considerable numbers, and usually remains until the latter end of March. It frequents the banks of deep ditches, and old turf walls.

Redwing, *Turdus iliacus.*—Common on migration in autumn and spring, and a few generally stay all winter, except in seasons of hard frost.

Fieldfare, *Turdus pilaris.*—Arrives here in large flocks in late autumn; but only stays for a day or two and then continues its journey south. A few make their appearance on the return journey in spring. The Merlin follows the flocks of Fieldfares, and takes a heavy toll of them.

Blackbird, *Turdus merula.*—Fairly common during winter and spring, when they are to be seen in all sheltered nooks. These birds leave rather earlier than the Song Thrush.

Wheatear, *Saxicola œnanthe.*—Abundant during summer, arriving about the latter end of March and beginning of April. Breeds mostly in old walls.

Whinchat, *Pratincola rubetra.*—I have only seen one here, and that was in the month of April about eight years ago.

Stonechat, *Pratincola rubicola.*—A regular winter visitor in small numbers. Frequents sheltered nooks among rocks.

Redbreast, *Erithacus rubecula.*—I see a few nearly every winter, chiefly about the stackyards.

Golden-crested Wren, *Regulus cristatus.*—I have only seen a single example here, and it was caught in a merchant's shop at Scarnish.

Willow Wren, *Phylloscopus trochilus.*—A regular visitor on the spring migration, but does not breed here.

Hedge Sparrow, *Accentor modularis.*—I have only seen a single bird here, and that one was in an exhausted state.

Wren, *Troglodytes parvulus.*—Common in winter, and a few remain all summer; but I do not think they breed here.

Pied Wagtail, *Motacilla lugubris.*—Rather rare. I saw one in my garden in March of the present year (1897).

White Wagtail, *Motacilla alba.*—A regular visitor, in small parties of three, four, or five individuals, on the spring migration, which lasts for some days. They pass here, on their return journey, from the middle of August to the beginning of September.

Meadow Pipit, *Anthus pratensis.*—An abundant resident and breeding species. As this bird does not seem to increase, the surplus stock must migrate to other fields. It frequents pastures, and nests in old turf walls.

Rock Pipit, *Anthus obscurus.*—A numerous resident and breeding species. It frequents the seashore, and breeds on rocky shelves.

Swallow, *Hirundo rustica.*—I see one or two nearly every summer, but they do not breed here.

Sand Martin, *Cotile riparia.*—This species bred here in 1886, and previously, but does not do so now.

Greenfinch, *Ligurinus chloris.*—Large flocks arrive in autumn and early winter. It mostly frequents turnip fields on its arrival. A few remain about the stackyards till spring.

House Sparrow, *Passer domesticus.*—Has become rather common within the last few years.

Tree Sparrow, *Passer montanus.*—Numerous and resident, and has been since the oldest inhabitant can remember. It breeds in the ruins of the old churches at Kirkapol. The natives say it was much more numerous at one time, and was regarded as a serious pest, as it shook the barley badly.

Chaffinch, *Fringilla cœlebs.*—An occasional winter visitor in small numbers. It never stays long here.

Twite, *Linota flavirostris.*—An abundant resident. It breeds among the short heather, and feeds in the grain-fields.

Corn Bunting, *Emberiza miliaria.* — Common, and resident. Breeds near the cornfields, and is only to be found where the ground is cultivated.

Yellow Bunting, *Emberiza citrinella.* — An occasional winter visitor in small numbers. It frequents the stackyards.

Snow Bunting, *Plectrophanes nivalis.*—A regular visitor on migration, appearing now and again in small flocks from October till the latter end of March.

Starling, *Sturnus vulgaris.*—A superabundant resident. It has become a great nuisance through its habit of nesting in the chimneys. These birds feed in winter on grubs, which they find among the seaweed spread by the farmers on their fields.

Chough, *Pyrrhocorax graculus.*—I have only seen one bird of this species here.

Jackdaw, *Corvus monedula.*—It has occurred, but it is rare here.

Raven, *Corvus corax.*—One pair is resident, and breeds every year on the cliffs at Kennavara Head. These birds do not seem to increase, although they are not molested in any way.

Carrion Crow, *Corvus corone.*—It has occurred, but is very rare.

Hooded Crow, *Corvus cornix.*—Common enough. Breeds on the cliffs on different parts of the island.

Rook, *Corvus frugilegus.*—An occasional spring visitor in small numbers.

Skylark, *Alauda arvensis.*—An abundant resident. Breeds all over the island.

Swift, *Cypselus apus.*—An occasional summer visitor, and is always seen singly.

Cuckoo, *Cuculus canorus.*—Occurs sparingly every summer.

Short-eared Owl, *Asio accipitrinus.*—Common on autumn and spring migrations. Frequents rushy fields and reedy bogs.

Peregrine Falcon, *Falco peregrinus.*—One pair breeds on the cliffs at Kennavara every year. They do not increase, although they are not molested in any way. I suppose the young birds leave every year.

Merlin, *Falco æsalon.*—Very numerous, especially during autumn, when they follow the flocks of migratory birds, such as Fieldfares, Golden Plover, Snipe, etc., and take heavy toll of them. A pair bred here in the summer of 1897.

Kestrel, *Falco tinnunculus.*—Occurs now and again, but as there are neither voles nor mice here they do not stay long. A pair nested in 1896 on the cliff at Kennavara.

Common Cormorant, *Phalacrocorax carbo.*—Fairly common round the coast, and sometimes to be seen on the lochs.

Shag, *Phalacrocorax graculus.*—Very common, and breeds in the caves at Kennavara Head.

Gannet, *Sula bassana.*—Fairly common round the coast, but does not breed here.

Common Heron, *Ardea cinerea.*—Common all the year round, although they do not breed. Frequents shallow lochs and ditches, where it feeds on eels and sticklebacks.

Graylag Goose, *Anser cinereus.*—Occurs now and again in winter, but does not stay long.

White-fronted Goose, *Anser albifrons.*—Common, and numerous from middle of October till the end of April. Arrives here from the north-west in autumn, and takes a north-westerly direction when leaving here in spring.

Bernicle Goose, *Bernicla leucopsis.*—Occurs now and again in small flocks of a dozen or so.

Brent Goose, *Bernicla brenta.*—Occurs only during hard frosts, and then but sparingly.

Whooper Swan, *Cygnus musicus.*—Has increased enormously as a winter visitor since I came to the island in 1886. At that time only about a dozen or so could be seen at a time. I counted several times during the last few winters nearly 200 of this species on Loch-a-Phuil.

Bewick's Swan, *Cygnus minor.*—A regular winter visitor, and increasing in numbers every year. A flock of about 200 spent some time on Island House Loch last winter.

Mute Swan, *Cygnus olor.*—I have seen a single straggler of this species on Island House Loch. A Black Swan spent the most of the summer of 1896 on Loch-a-Phuil.

Common Sheldrake, *Tadorna cornuta.*—Resident, and breeds.

Mallard, *Anas boscas.*—Numerous, and resident all the year round. Breeds on all parts of the island where it can find cover for its nest.

Gadwall, *Anas strepera.*—Very common. Arrives about the end of harvest, and stays until late spring. Frequents the sea-coast during the day-time, and flights in the evening to brackish pools to feed.

Shoveller, *Spatula clypeata.*—Fairly common. A few pairs breed on the island every summer.

Pintail, *Dafila acuta.*—Occurs sparingly on migration.

Teal, *Querquedula crecca.* — A numerous and resident species. Breeds in suitable places all over the island.

Widgeon, *Mareca penelope.*—Numerous during autumn, winter, and spring. Frequents both the sea-shore and the fresh-water lochs.

Pochard, *Fuligula ferina.*—Numerous during winter, and a few remain to breed.

Tufted Duck, *Fuligula cristata.*—Common during autumn, winter, and spring. A few remain to breed, but they have only begun to do so within the last few years.

Scaup, *Fuligula marila.*—A regular winter visitor in considerable numbers. A few begin to arrive towards the latter end of September. They frequent both the sea-shore and the fresh-water lochs.

Golden-eye, *Clangula glaucion.*—Common during winter and spring. It is rather late in arriving, and frequents both the salt and fresh water.

Long-tailed Duck, *Harelda glacialis.* — Very common during winter and spring round the coast. I have seen them feeding on fresh-water lochs.

Eider Duck, *Somateria molissima.*—An abundant resident, breeding in all suitable parts of the island. It very rarely leaves the sea, except during the nesting season.

Common Scoter, *Œdemia nigra.*—Fairly common, but are never numerous. A pair bred here this year, 1897. I watched the male bird while the female was incubating, but failed to find the nest. However, I have since seen both old birds with a brood of five young ones, and have often been quite close to them.

Goosander, *Mergus merganser.*—Used to be fairly numerous some years ago, but I have not observed any for the last two years.

Red-breasted Merganser, *Mergus serrator.* — An abundant resident, breeding on all suitable parts of the island. Frequents both fresh and salt water.

Smew, *Mergus albellus.*—Common on Gott Bay during autumn, winter, and spring. It is one of the earliest migratory Ducks to arrive. It is entirely a marine species here.

Rock Dove, *Columba livia.*—Resident, and breeds in caves in different parts of the island.

Pallas Sand Grouse, *Syrrhaptes paradoxus.* — Several flocks occurred here during the summer of 1888. They arrived about the end of May, and continued off and on until about the first week of October.

Common Partridge, *Perdix cinerea.*—Both English and Hungarian Partridges have been introduced into the island.

Quail, *Coturnix communis.*—I have only seen one bird of this species here. It lay so close among the grass that I could easily have caught it.

Land Rail, *Crex pratensis.* — An abundant summer visitor, and breeds among the crops, though principally among the iris. Arrives about the end of May and beginning of June, and leaves about September.

Water Rail, *Rallus aquaticus.*—Fairly numerous in winter; a few remain all summer, but I do not know whether they breed here or not.

Water Hen, *Gallinula chloropus.*—Resident all the year round. Breeds in reedy marshes.

Coot, *Fulica atra.*—An abundant resident. Frequents reedy lakes, and makes its nest among the reeds.

Ringed Plover, *Ægialitis hiaticula.*—Abundant, and resident all the year round. Breeds on the flat rocks and sandy reaches.

Golden Plover, *Charadrius pluvialis.*—Numerous during autumn, winter, and spring. Arrives in enormous flocks during September and October. Frequents the sandy machars, but never frequents the sea-shore here.

Gray Plover, *Squatarola helvetica.*—A regular visitor on its autumn and spring migrations. Frequents the sea-shore and brackish pools.

Lapwing, *Vanellus vulgaris.*—Numerous as a breeding species, but only a few remain all winter.

Turnstone, *Strepsilas interpres.*—Abundant during autumn, winter, and spring. A good many remain all summer, but they do not breed. They frequent the sea-shore, but come on to the fields during stormy weather, and turn up the cow-dung in search of grubs, insects, and worms.

Oyster-catcher, *Hæmatopus ostralegus.* — Resident all the year. Frequents the sea-shore, and breeds there.

Gray Phalarope, *Phalaropus fulicarius.*—An immature bird of this species was shot in a marsh near Kennavara, in September 1886; and I identified one that I saw flying about over a small bay on the sea-shore at Heinish, in November 1890.

Woodcock, *Scolopax rusticula.* — A regular winter visitor, but numerous only during hard frost.

Common Snipe, *Gallinago cœlestis.*—A numerous resident species, breeding on all suitable parts of the island. Migratory Snipe begin to arrive in September, and continue off and on all winter, if the weather is favourable.

Jack Snipe, *Gallinago gallinula.*—A regular autumn and winter visitor, arriving as early as the latter end of September in considerable numbers. It prefers mossy bogs to muddy places.

Dunlin, *Tringa alpina.*—Resident, and breeds all over the island. Only a few remain all winter. It breeds on rough boggy ground, and feeds on the sandy ebb.

Little Stint, *Tringa minuta.*—Occurs occasionally on migration. I have seen as many as twenty in a flock, but they do not occur every year.

Purple Sandpiper, *Tringa striata.*—A regular winter and spring visitor, but is most numerous in spring. It frequents the rocky parts of the coast.

Knot, *Tringa canutus.*—A regular autumn and spring visitor, but is most numerous in autumn. I have seen them here as early as August. They frequent the sandy shores.

Sanderling, *Calidris arenaria.*—Sanderlings are numerous here during autumn, winter, and spring; and, like the Knot, frequent the sandy shore.

Ruff, *Machetes pugnax.*—An occasional autumn visitor. I have not noticed it in spring. It frequents and wades in shallow pools.

Common Sandpiper, *Totanus hypoleucus.*—A regular summer visitor in small numbers. It breeds and feeds about the margins of lakes and shallow pools.

Redshank, *Totanus calidris.*—The Redshank stays with us during the autumn, winter, and spring.

Greenshank, *Totanus canescens.*—Common during autumn, winter, and spring. A pair bred here a few years ago, but I have not noticed them breeding since. It frequents shallow pools, both salt and fresh.

Bar-tailed Godwit, *Limosa lapponica.*—Common, arriving in autumn and leaving in late spring. Frequents the sandy shores.

Black-tailed Godwit, *Limosa belgica.*—Rather rare. I shot one several years ago in spring, and I have seen a few single birds since—always in spring. It has a peculiar, wild, eerie cry, which is unlike that of any other bird I know.

Curlew, *Numenius arquata.*—Abundant during autumn, winter, and spring. It feeds a good deal on a small mollusc, which it finds on the machars. The bird roosts mostly on the rocks by the sea-shore.

Whimbrel, *Numenius phæopus.*—Passes here in large flocks in May, the migration continuing the whole of the month. Comparatively few come here on the return journey in August.

Sandwich Tern, *Sterna cantiaca.*—An occasional visitor on migration. One was shot and identified some years ago.

Common Tern, *Sterna fluviatilis.*—A numerous breeding species.

Arctic Tern, *Sterna macrura.*—An abundant breeding species, more numerous I think than the Common Tern.

Little Tern, *Sterna minuta.*—There are several colonies of Little Terns on the island. It breeds on the sand, above and close to high-water mark.

Black-headed Gull, *Larus ridibundus.*—A few pairs breed on the island, but they are never numerous.

Common Gull, *Larus canus.*—Numerous, and breeding on the flat rocks all over the island.

Herring Gull, *Larus argentatus.*—Common, resident, and breeds.

Lesser Black-backed Gull, *Larus fuscus.*—Same remarks apply to this species as to the Herring Gull.

Great Black-backed Gull, *Larus marinus.*—Common enough, but I do not think it breeds, for I have never found its nest on this island.

Glaucous Gull, *Larus glaucus.*—I have seen a single bird now and again of this species.

Kittiwake Gull, *Rissa tridactyla.*—Numerous, resident, and breeds. It nests on precipitous cliffs which are quite inaccessible.

Richardson's Skua, *Stercorarius crepidatus.*—A regular summer visitor, arriving about the beginning of June. It has bred on the island, but does not do so every summer.

Razorbill, *Alca torda.*—Resident, and breeding on the cliffs at Kennavara Head.

Common Guillemot, *Uria troile.*—Not nearly so numerous as the Razorbill, and breeds along with that species at Kennavara Head. Formerly this species was by far the more numerous of the two.

Little Auk, *Mergulus alle.*—A few come ashore dead in winter, some of which are quite fresh. I have never seen a living one round the coast.

Black Guillemot, *Uria grylle.*—Not numerous, but a few pairs breed on the island.

Puffin, *Fratercula arctica.*—Common during summer round the coast, but it does not breed here.

Great Northern Diver, *Colymbus glacialis.*—Fairly common round the coast. It returns here from its breeding-grounds as early as the end of August.

Black-throated Diver, *Colymbus arcticus.*—A few to be seen round the coast in spring; rare at other times.

Red-throated Diver, *Colymbus septentrionalis.*—Fairly common round the coast, especially during autumn. It does not breed here.

Great-crested Grebe, *Podicipes cristatus.*—Occurs occasionally. I have seen a pair as late as the month of April on Loch Vasapol.

Slavonian Grebe, *Podicipes auritus.*—Common during winter and spring. It frequents the lochs mostly, but it is sometimes to be seen on the sea.

Little Grebe, *Podicipes fluviatilis.*—Fairly common, though never numerous. It frequents the lochs, and goes to the sea during hard frost.

Fulmar, *Fulmarus glacialis.*—Not uncommon. I have caught examples several times, which seemed to be unable to rise off the flat ground, although their wings appeared to be uninjured.

Great Shearwater, *Puffinus major.*—Very rare. I found one dead on the "Reef" in October 1891 ("Annals," 1892, p. 74).

Manx Shearwater, *Puffinus anglorum.*—Is sometimes very common round the coast, while at other times there are none to be seen.

Forked-tailed Petrel, *Oceanodroma leucorrhoa.*—I once found a bird of this species which had killed itself by flying against the telegraph wire.

Storm Petrel, *Procellaria pelagica.*—Not uncommon round the coast during summer. I have seen it at Kennavara Head during the breeding season, and I think it may perhaps breed there.

ON THE NESTING OF THE PINTAIL (*DAFILA ACUTA*) IN THE "FORTH" AREA.

By William Evans, F.R.S.E.

The late John Hancock believed, apparently on substantial grounds, that the Pintail bred at Prestwick Car, in Northumberland, prior to the drainage of that famous bird-haunt many years ago.[1] Sir Ralph Payne-Gallwey has stated that in Ireland it has bred in Lord Castletown's duck preserves at Abbeyleix, Queen's County, and that he has himself seen females with young broods on Loughs Mask and Corrib in County Galway.[2] As regards Scotland, Mr. Harvie-Brown obtained four duck's eggs on the island of Hysgeir, Inner Hebrides, in June 1881, which he afterwards identified as Pintail's by means of the down and a feather found in the nest;[3] and he has also recorded a supposed nest got on a loch in Sutherland in 1882.[4] Such, shortly, is the sum-total of the recorded information concerning this, one of the most graceful of ducks, as a British breeding species.[5] It is, therefore, no small satisfaction to me to be able to record the nesting of several—perhaps not less than six or seven—pairs this year on a loch in the Forth area, to wit Loch Leven in Kinross-shire.

Pintail on Loch Leven in March, which I had myself seen, had little or no significance; but when Messrs. T. G. Laidlaw and Bruce Campbell reported having observed a pair there on 1st May 1897, and again on 30th April of the present year, my suspicions were aroused, and I determined to thoroughly investigate the matter. Accordingly, on 14th May last, accompanied by my son, who wished to photograph a few nests, I visited a portion of the loch, and had the pleasure of seeing three of the birds I was in search of, namely a male and a female feeding quietly in a grassy pool,

[1] "Catalogue of the Birds of Northumberland and Durham," 1874. A. G. More states that Hancock had found the nest ("Ibis," 1865, p. 443).

[2] "The Fowler in Ireland," 1882.

[3] "Proceedings Royal Physical Society," vol. vii., 1881-83.

[4] "Fauna of Sutherland," etc., 1887.

[5] Mr. Charles Dixon states in his "Nests and Eggs of British Birds" that he has every reason to believe that the Pintail breeds on certain small rocky islets in the Firth of Forth. Such statements, however, prove nothing, and cannot, therefore, be taken into account.

and a beautiful drake flying backwards and forwards in a manner which strongly suggested his having a mate on a nest not far off—we had to leave, however, without settling this point. On the 18th we returned, and devoted our attention to other portions of the loch. On this occasion we observed altogether seven Pintails—four males and three females, two of the latter being flushed from their nests containing eight and five eggs respectively. Our delight knew, of course, no bounds, and we came home well pleased with the success of our expedition.

But my observations did not stop here, investigations in other branches of natural history necessitating further visits to the loch and affording at same time opportunity for extending my acquaintance with the Pintails. On 25th May a single drake was all that was noticed, but on 8th June I saw no fewer than three males and six females, all of them, except two of the ducks which were on their nests, being in view at one time—a sight to gladden the heart of any student of British ornithology. The two nests referred to were within a hundred yards of each other, and each contained six deeply incubated eggs—there were signs, however, that the number had once been greater. An empty nest with portions of hatched eggs beside it was also found. Altogether it was an eventful day, the memory of which I shall long cherish.

Many nests of other species of duck were found, and all suspicious ones carefully identified. As a matter of fact, however, the four Pintails' nests were never in doubt from the moment the ducks rose from them. When put off the nests, which were placed in tufts of grass in dry and open situations at some distance from the water, the birds invariably alighted within forty or fifty yards, so that even without using my binoculars I could recognise them perfectly well. But, for the satisfaction of those who look for more convincing evidence of identification, I may mention that I placed a couple of the eggs in an improvised incubator, and at the end of a week had the pleasure of seeing two unmistakable Pintail ducklings. As regards the "down" test, I must confess I am not an out and out believer in it. I have Wild Duck down which it would be hard to separate from that of the Pintail.

It may be thought that, in the interests of the birds, I ought to have withheld the name of the locality. This I would gladly have done, had I not been convinced, after full consideration of all the circumstances, that publicity in this instance is more likely to do good than harm. Vague references to localities are, in my experience, of little use—those who want to find them out generally soon manage to do so. Besides, the law now provides means for the protection of the eggs of wild birds, and it will be well if it can be put in operation for the benefit of the Pintails and other birds at Loch Leven before another breeding season comes round, for some of them seem to have need of it. In any case, should this note induce any one to visit the locality in search of Pintails' nests, I hope he will, in honour, refrain from interfering unnecessarily with the birds or their eggs.

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S.

(*Continued from p.* 111.)

[Names of plants in *italics*, except as synonyms within curved brackets, denote that the plants were *certainly* introduced into Scotland by man. † after a district number denotes introduction by man into the district; "cas." denotes casual occurrence, and "esc." evident escape or outcast from cultivation, both being due to man's agency. Square brackets enclosing the name of a plant or a district number denote that the record was made in error. ? after a district number denotes, at least, need of confirmation; after † it denotes doubt as to whether the plant owes its presence in the district to man.]

Rosaceæ (*continued*).

Fragaria vesca, *L.*, *except 110.*
F. elatior, Ehrh., an escape in many places.
Potentilla norvegica, L., escape in 77.
P. Fragariastrum, *Ehrh.*, *except 104, 107, 111* (?), *112.*
P. verna, *L.*, 81-83, 85, 90.
P. rubens, *Vill.* (*P. maculata*, Pourr. = *P. Salisburgensis*, Hænke), 72, 86, 88-90, 92, 97, 104, 107, 108.
P. silvestris, *Neck.* (*P. Tormentilla*, Scop.), all.
P. procumbens, *Sibth.*, 72-74, 76, 77, 80, 81, 85 (?), 86-89, 91-93, 99, 100, 102, 106 (?), 111.
P. reptans, *L.*, 72-77, 79-83, 85-90, 91 (?), 92†, 94, 99, 100, 103, 106.
P. Anserina, *L.*, all.

[P. rupestris, *L.*, 83 ?].
P. argentea, *L.*, 72, 80-85, 87-90, 95.
P. fruticosa, L., 77†, 83†. (Both records from "Top. Bot.")
P. palustris, *Scop.* (*Comarum palustre*, L.), *except 78.*
P. Sibbaldi, *Hall fil.* (*Sibbaldia procumbens*, L.), 72 cas., 73, 78, 86-90, 92, 94, 96-99, 104-106, 108, 112.
Alchemilla arvensis, *Scop.*, all.
A. vulgaris, *L.*, all.
a. pratensis (*Schmidt*), 72,†74, 83, 84, 88-90, 92, 99, 100, 111.
b. alpestris (*Schmidt*), 72, 74, 77, 84, 86, 88, 92, 96, 97, 99, 100, 103.
c. filicaulis (*Buser*), 72, 74, 80, 89, 100.
A. alpina, *L.*, 72 (?), 86-92, 94-100, 102-110, 112.
A. argentea, *Lam.* (*A. conjuncta*, Bab.), an occasional escape; reported as native in 90 and 100.
Agrimonia Eupatoria, *L.*, *except 78, 84, 101, 105, 107, 111, 112.*
A. odorata, *Mell.*, 73, 74, 86, 88, 89, 91, 100.
Aremonia agrimonioides, DC., a casual, or seminaturalised, in 72, 89, 92.
Poterium Sanguisorba, *L.*, 72 (?), 73, 74, 77 (?), 80, 81, 82†, 83†, 88-90, 95 (?), 99.
P. officinale, *Hook. fil.*, 72-75, 79-81, 90†.
P. muricatum, Spach, 88†.
Sanguisorba canadensis, L., casual in 88, 89.
Rosa, *L.* In this genus also, as with *Rubus*, the older records are not to be depended on, the views now held by students of the genus differing much from those that are embodied in the older lists. Below will be found two lists. The first, and more full, follows the ninth edition of the "London Catalogue of British Plants" in the enumeration of species and varieties recorded from Scotland. It is based on "Topographical Botany," second edition, with Mr. Bennett's "Additional Records," published in the "Scottish Naturalist" and in the "Annals." A good many additions are made for the counties of Dumfries, Kirkcudbright, and Wigtown, in Mr. Scott-Elliott's "Flora of Dumfriesshire" (1896). These are indicated by "s" after the numbers of these counties. For more precise information about them the reader must refer to the book. In Dr. White's "Flora of Perthshire," very recently published, there are many additional records of varieties not included under the above lists, but chiefly founded on specimens preserved in the herbarium of the Perthshire Natural History Museum, and named by Mr. J. G. Baker and Mr. G. Nicholson. These apply to the vice-counties 87, 88, 89 (West, Mid, and East Perthshire), and are indicated by "w"

after each number. The "Flora" should be consulted for the particulars under each record.

The second list given below is based on M. Crepin's study of roses sent to him from Scotland, chiefly by Mr. William Barclay of Perth, and summed up in this journal in 1895, pp. 39-47, and in 1896, pp. 116-121, 169-176, in a paper by Mr. Barclay. It has been thought more likely to be useful to keep these lists apart than to attempt to combine them into one.

R. pimpinellifolia, *L.*

f. spinosissima, *L., except 78, 84, 101, 105, 107, 111, 112.*

R. involuta, *Sm.*, 72s, 75, 79, 87, 88w, 89w, 96, 106, 108.

b. Sabini (*Woods*), 74, 77†, 81-84, 88, 89w, 90, 92, 93, 95, 97, 102, 105, 107, 109, 111.

R. hibernica, *Sm.*, 72s, 88w, 89w, 95, 108.

R. mollis, *Sm., except 75, 76, 81, 82, 83, 84, 101, 103, 112.*

b. cœrulea, *Woods*, 72s, 73s, 74s, 88w, 89.

c. pseudo-rubiginosa (*Lej.*), 72s.

R. tomentosa, *Sm., except 73, 102, 107.*

b. subglobosa (*Sm.*), 72s, 88w, 89w.

c. farinosa, *Seringe*, 88w, 89w.

d. scabriuscula (*Sm.*), 72s, 76, 107.

g. sylvestris (*Lindl.*), 88w.

R. rubiginosa, *L., except 75, 80, 87, 93, 98, 103, 104, 108, 109, 110, 111, 112*, in almost all with †.

R. micrantha, *Sm.*, 81, 95, 109.

c. hystrix (*Leman*), 72.

R. sepium, *Thuill.*, 79.

R. obtusifolia, *Desv.*, 88 (?).

b. frondosa, *Baker*, 88w, 89w.

c. tomentella (*Leman*), 72s, 88w.

R. canina, *L., except 102, 110.*

a. lutetiana, *Leman*, 72s, 74s, 87w, 88w, 89w, 107, 110, 111.

forma andevagensis (*Bast.*), 72s, 88w, 89w.

b. surculosa (*Woods*), 88w, 89w.

c. sphærica (*Gren.*), 88w, 89w.

e. dumalis (*Bechst.*), 72s, 73s, 74s, 76, 88w, 89w, 99, 107, 110, 112.

forma verticillacantha (*Mérat*), 72s, 76, 88w.

i. urbica (*Leman*), 72s, 74s, 88w, 89w.

j. dumetorum (*Thuill.*), 72s, 73s, 74s, 88w.

k. arvatica, *Baker*, 72s, 88w, 89w, 107.

forma cæsia (*Sm.*), 88w.

l. pruinosa, *Baker*, 72s, 88w, 89w.

m. incana (*Woods*), 72s, 88w.

o. Borreri (*Woods*), 72s.

R. glauca, *Vill.*, 72s, 87w, 88w, 89w, 109.
b. subcristata, *Baker*, 72s, 74s, 76, 88w, 89w, 112.
d. implexa (*Gren.*), 88w.
e. coriifolia (*Fr.*), 72s, 88w, 89w.
f. Lintoni, *Scheutz*, 92.
g. Watsoni, *Baker*, 72s, 88w.
R. stylosa, *Desv.*, doubtfully recorded from 77, 84, 86, 90, 96, 97, 99.
R. arvensis, Huds., 72s, 76, 77, 80-86, 88-91, with † in all.
R. alpina, L., Perthshire, casual.
R. cinnamomea, L., Perthshire, casual.
R. Dicksoni, Lindl., 72s†.

Scottish Roses determined by M. Crepin, from examples sent to him.

R. pimpinellifolia, *L.*, 85, 87, 88.
v. spinosissima, *L.*, 85, 88.
R. involuta, *Sm.*, 75, 87-89, 100.
R. pimpinellifolia × tomentosa (*R. Sabini*), Perthshire.
R. pimpinellifolia × mollis (*R. Sabini*), Perthshire, 108.
R. mollis, *Sm.*, 79, 85-90.
R. tomentosa, *Sm.*, 79, 80, 85-89, 100.
v. subglobosa, *Sm.*, Perthshire.
v. cinerascens, *Dumt.*, Perthshire.
R. rubiginosa, *L.*, 75, 80, 83, 85, 88, 89. An old introduction, if not native.
R. obtusifolia, *Desv.*, South Scotland.
R. canina, *L.*
v. lutetiana, *Leman*, 85, 88, 89.
v. dumalis, *Bechst.*, 79, 86, 98-99, 100.
v. dumetorum (*Thuill.*), 81, 85, 87-89.
v. subcanina (*Christ*), 87-89, 100.
v. subcollina (*Christ*), 88, 89.
R. glauca, *Vill.*, 79, 85-89, 100.
v. coriifolia (*Fr.*), 75, 79, 80, 85-89.
R. arvensis, Huds., Perthshire†.
R. alpina, L., Perthshire†.
R. hibernica, *Sm.*, 89.
var. glabra, *Baker*.

Pyrus torminalis, Ehrh., 106†.
P. Aria, *Ehrh.*, 75†, 77†, 81†, 83, 85†, 86†, 88, 90†, 91†, 92†, 93†, 94†, 95†, 98†, 103†, 104†, 108† (?). Doubtfully indigenous in Scotland, more probably introduced by man.
P. intermedia, *Ehrh.*, 85†, 100, 106.
P. pinnatifida, *Ehrh.*, 90†, 99†, 100.
P. Aucuparia, *Ehrh.*, *except 84.*

P. communis, L., a. *Pyraster* (L.), has been found in Perthshire, "scarcely indigenous."

P. Malus, *L.*, recorded for all *except 72* (?), *73*† (?), *74*† (?), *82*, *85*, *90*† (?), *91*†, *92*†, *93*†, *94*†, *95*†, *98*, *99*, *100*†, *103*, *104*, *105*, *107*, *109*, *110*, *111*, *112*; but probably not indigenous in some of the districts besides those marked as introduced.

a. acerba, *DC.*, 74, 87-89.

b. mitis, Wallr., 74†, Perthshire†.

Cratægus Oxyacantha, *L.*, *except 111*. Probably introduced into some of the districts. The common form is *d.* monogyna (*Jacq.*); *a.* oxyacanthoides (*Thuill.*) has been gathered near Aberuthven in Perth.

Saxifragaceæ.

Saxifraga oppositifolia, *L.*, 72, 74† (?), 86-90, 92-94, 96-101, 104-106, 108-112.

S. nivalis, *L.*, 72, 86-90, 92, 96-99, 103 (?), 104, 106 (?).

S. stellaris, *L.*, *except 74*, *76*, *77*, *80*, *81*, *82*, *83*, *84*, *93*, *101*, *111*, *112*.

S. Geum, L., casual in 87.

S. umbrosa, L., naturalised or an escape in several districts, 86-88, 92.

S. rotundifolia, L., 88 escape.

S. Hirculus, *L.*, 77, 81, 83, 87 (?).

S. aizoides, *L.*, *except 73*, *74*, *77*, *78*, *79*, *80*, *81*, *82*, *83*, *84*, *85*, *93*, *109*, *110*, *112*.

S. tridactylites, *L.*, 79, 82-85, 87-90, 92, 93, 96, 103, 106, 107, 109.

S. rivularis, *L.*, 88, 90 (?), 92, 96, 97.

S. cernua, *L.*, 88.

S. granulata, *L.*, 72, 73, 74†, 75-95, 111 (?).

S. cæspitosa, *L.*, 90 (?), 92 (?), 94, 96, 97.

S. grœnlandica, *L.*, 88.

S. hirta, Haw. (*S. sponhemica*, Gmel.), 72, 87, 88, 96-98, 104.

S. hypnoides, *L.*, *except 74*, *78*, *79*, *80*, *81*, *82*, *84*, *95*, *102*, *103*, *106*, *107*, *110*, *112*.

Chrysosplenium oppositifolium, *L.*, *except 112*.

C. alternifolium, *L.*, *except 74*, *84*, *85*, *97*, *100*, *101*, *102*, *103*, *104*, *105*, *106*, *107*, *108*, *109*, *110*, *111*, *112*.

Parnassia palustris, *L.*, *except 78*, *110*.

Ribes Grossularia, L., naturalised in various districts, *e.g.* 72-74, 84, 87-92.

R. alpinum, L., introduced into 72, 73, 75-77, 80-84, 86, 89, 92

R. rubrum, *L.*

a. sativum (Reichb.), introduced into 72, 73, 86-89 91, 92.

b. petræum (*Sm.*), 87†, 88, 89†, 90 (?), 91† (?), 93 (?), 95, 96, 102, 109.

c. spicatum (*Reichb.*), 104.

R. nigrum, L., introduced into 72-74, 91, 92.

Crassulaceæ.

Cotyledon Umbilicus, *L.*, 73 cas., 74†, 75, 76, 87†, 92†, 98, 100, 101, 103.

Sedum roseum, *Scop.* (*S. Rhodiola*, DC.), *except 76, 77, 78, 79, 80, 82, 84, 91, 95.*

S. Telephium, *L.*, 72-77, 80-83, 85†, 86†, 87†, 88†, 89†, 90†, 91†, 92†, 95, 96, 100†, 111†, 112†.

b. Fabaria, H. C. Wats. Naturalised in several districts, *e.g.* 79, 87-90, 92, 93, 99.

S. villosum, *L.*, 72, 73, 75-77, 79-81, 83-95, 98-100.

S. album, L., introduced into 87-89, 91.

S. dasyphyllum, L., introduced into 87-89.

S. anglicum, *Huds.*, 72-76, 85-88, 90, 95, 97-105, 107, 108, 110, 112.

S. acre, *L.*, *except 79, 112.*

S. reflexum, L., 86†, 88†, 89†, 92†.

S. rupestre, L., 74†, 86†, 88†, 89†.

Sempervivum tectorum, L., frequent about houses as an introduced plant, *e.g.* in 72-74, 87-89, 91, 92.

Droseraceæ.

Drosera rotundifolia, *L.*, *except 84.*

D. anglica, *Huds.*, *except 78, 79, 80, 82, 83, 84, 90, 94, 97, 102.*

× rotundifolia (= *D. obovata*, Mert. and Koch), 88, 89, 92, 96, 98, 102-105, 108, 110.

D. intermedia, *Hayne*, 72, 73 (?), 74, 76 (??), 85 (??), 88 (??), 92 (??), 96, 97, 99, 100 (??), 102, 104, 105, 109, 111 (??), 112 (??).

Haloragaceæ.

Hippuris vulgaris, *L.*, *except 78, 84, 87, 97, 104, 106, 108.*

Myriophyllum spicatum, *L.*, *except 79* (?), *81* (?), *82* (?), *84* (?), *91, 92* (?), *93, 94* (?), *95* (?), *96* (?), *102* (?), *104, 105, 107, 112* (??).

M. alterniflorum, *DC.*, *except 75, 76, 77, 79, 82, 84, 101.*

Callitriche stagnalis, *Scop.*, *except 84.*

C. polymorpha, *Lönnr.*, 97, 112.

C. hamulata, *Kuetz*, 72, 73, 74, 87-90, 97, 98, 104, 108.

C. autumnalis, *L.*, *except 75, 76, 77, 78, 79, 81, 82* (?), *83, 84, 93, 97, 98, 99, 100, 101, 103, 104, 107, 108* (?), *110.*

Lythraceæ.

Peplis Portula, *L.*, *except 78, 80, 82, 84, 97, 104, 105, 107, 112.*

Lythrum Salicaria, *L.*, *except 78, 83, 84, 90, 91* cas., *92, 93, 94, 95, 104, 105, 106, 107, 108, 109, 111, 112.*

L. Hyssopifolia, L., casual in 87.

Onagraceæ.

Epilobium angustifolium, *L.*, *except 76, 77†, 78, 82, 85†, 99†, 100, 103, 107.*
E. hirsutum, *L.*, *except 78, 92, 93†* (?), *94, 95, 96†, 97, 101, 102, 103, 104, 105, 106, 107, 108, 109†, 110, 111* (?), *112.*
E. parviflorum, *Schreb.*, *except 78, 84, 107, 108, 112.*
E. montanum, *L.*, all.
E. roseum, *Schreb.*, 72, 73, 82 (?), 83, 85 (?), 90 (?), 95 (?).
E. adnatum, *Griesb.* (*E. eu-tetragonum*), 72, 83 (?), 89 (?), 97, 98.
E. obscurum, *Schreb.*, *except 75, 76, 77, 81, 82, 84, 93, 94, 95, 96, 101, 102, 104, 112.*
E. palustre, *L.*, all.
E. alsinefolium, *Vill.*, 72, 80, 85, 87-92, 94, 96-98, 104-106, 108.
E. anagallidifolium, *Lam.*, 72 (?), 85 (?), 86-92, 94, 96-99, 104-106, 108, 110.
Œnothera biennis, L., casual in 72, 73, 87.
Circæa lutetiana, L., *except 78, 84, 90* (?), *91* (?), *92* (?), *93* (?), *94, 95, 96* (?), *99* (?), *103, 104* (?), *107, 108, 109* (?), *110, 111, 112.*
C. alpina, *L.*, 72, 75 (?), 77 (?), 82 (?), 83 (?), 85 (?), 86-90, 91 (?), 92 (?), 93 (?), 94 (?), 95-100, 102-108, 111.
b. intermedia (*Ehrh.*), 72, 79, 86, 92, 93 (?), 95.

Umbelliferæ.[1]

Hydrocotyle vulgaris, *L.*, *except 78, 80.*
Eryngium maritimum, *L.*, 72-77, 82, 83, 85, 87 (?), 90, 91 ext., 93 ext., 100-104, 110, 112.
Astrantia major, L., casual, along streams, etc., 72, 84, 88, 89.
Sanicula europæa, *L.*, *except 78, 111, 112.*
Conium maculatum, *L.*, *except 78, 98, 104, 105, 106, 112*; but its distribution (in the vicinity of houses and roads) is very suggestive of man's agency in its introduction and distribution.
[2] Smyrnium Olusatrum, *L.*, 75, 76, 81-83, 85, 86†, 87†, 91†, 92†, 93†, 94†, 99, 100.
Bupleurum rotundifolium, L., casual in 80, 92.
Apium graveolens, *L.*, 73, 74, 83†, 85†, 87† (?), 92 cas., 95†, 101, 104.
A. nodiflorum, *Reichb. fil.*, 72-74, 76, 77, 80, 85, 99-103, 110.
c. ocreatum, *Bab.*, 103.

[1] Umbelliferæ.—In this order there are several species admitted in lists without question as to origin whose habitats (almost always near houses, by roadsides, on rubbish heaps, in pleasure grounds, in cultivated fields and pastures, or beside streams below gardens) indicate the probability that they owe at least their present wide distribution in, if not their introduction into, Scotland, to man.

[2] *Smyrnium Olusatrum*, L.—Probably a relic of former cultivation in almost every district, if not in all.

A. inundatum, *Reichb. fil.*, *except 78, 79, 84, 97, 104, 105, 108, 112.*
Cicuta virosa, *L.*, 72, 73, 75-77, 79-81, 83, 85, 88, 90, 99, 110.
Carum verticillatum, *Koch*, 72-76, 86, 88 (Glen Falloch), 97-101.
C. Petroselinum, Benth. and Hook. f., escape in 86, Perthshire, 92.
[C. segetum, *Benth.*, 103 (??).]
C. Carui, L., a frequent weed near houses, † in 73, 74, 86-89, 91-93, 108.
Sison Amomum, L., 81†.
Falcaria vulgaris, Bernh., 87†.
Sium latifolium, *L.*, 74, 82 (?), 86.
S. erectum, *Huds.*, 72-76, 80-83, 85, 87, 89-91, 93, 95, 103, 111, 112.
[1] Ægopodium Podagraria, *L.*, *except 105, 107*†, *110, 112*†.
Pimpinella Saxifraga, *L.*, *except 103, 104, 105, 106, 110, 112.*
P. major, *Huds.*, 80†, 83, 87† (?).
Conopodium denudatum, *Koch*, *except 110.*
[2] Myrrhis Odorata, *Scop.*, *except 98, 102, 104, 106, 107, 111, 112*, but with † in 72, 85, 87-96, 103.
[3] Chærophyllum temulum, *L.*, *except 73*†, *96, 97, 101, 102, 103, 104, 105*†, *107, 108, 110, 111, 112.*
[4] Scandix Pecten-Veneris, *L.*, *except 72* cas., *73, 74, 78, 79, 87, 97, 98, 101, 102, 103, 104, 107, 110, 111* (?), *112*†.
[5] Anthriscus vulgaris, *Bernh.*, 74, 75, 77, 80†, 81-87, 89-96, 106, 107† (?) 112 (??).
[6] A. sylvestris, *Hoffm.*, *except 80, 106.*
Fœniculum vulgare, Mill., 83†, 90†.
Crithmum maritimum, *L.*, 73-75, 83 (??), 85 (??).
Œnanthe fistulosa, *L.*, 72, 73, 75, 76 (?), 81, 85 (?), 88, 89, 90 (?), 99 (?).
Œ. pimpinelloides, *L.*, 87† (?).
Œ. Lachenalii, *C. Gmel.*, 72-76, 82, 98-103, 110.
Œ. crocata, *L.*, *except 78, 79, 84, 94, 106, 107, 108, 109, 111, 112.*
Œ. Phellandrium, *Lam.*, 81-83, 97 (?), 99 (?).

[1] *Ægopodium Podagraria*, L.—Though frequently so plentiful and troublesome near houses and gardens, this is seldom met with under circumstances that render its introduction by man improbable.

[2] *Myrrhis Odorata*, Scop.—Almost always occurs in situations that point to its introduction by man.

[3] *Chærophyllum temulum*, L., is local and scarce (? introduced) in 91-94 at least. *Ch. aureum*, L., and *Ch. aromaticum*, L., were reported by G. Don as found by him in 90. If correctly identified they must be looked on as casuals.

[4] *Scandix Pecten-Veneris*, L.—This is only a weed of cultivated fields, and must owe its presence in our flora to man.

[5] *Anthriscus vulgaris*, Bernh., is confined to vicinity of towns and villages in at least 91 to 94, probably introduced.

[6] *A. sylvestris*, Hoffm.—Though wide spread, and apparently not dependent on man at lower levels, this seems to have been introduced at higher altitudes.

[1] Æthusa Cynapium, *L.*, 72-83, 85, 86, 87†, 88†, 89†, 90, 91†, 92†, 93†, 94†, 95†, 99, 100, 105†, 106, 111†.
Silaus flavescens, *Bernh.* (*S. pratensis*, Bess.), 80-83, 85.
Meum Athamanticum, *Jacq.*, 72-78, 80, 83-92, 96, 98, 99.
Ligusticum scoticum, *L.*, *except 72, 76, 77, 78, 79, 80, 84, 86, 87, 88, 89, 96, 98, 99, 105, 107.*
Angelica sylvestris, *L.*, all.
Archangelica officinalis, Hoffm., 87 cas.
Peucedanum Ostruthium, Koch, casual or escape in 72, 73, 86, 87, 109.
[P. palustre, *Mœnch*, recorded from 76 and 83, probably erroneously.]
P. sativum, Benth. and Hook. f., 75†, 87†, 92 cas., 100†.
Heracleum Sphondylium, *L.*, all.
b. angustifolium, *Huds.*, is of frequent occurrence.
(*H. villosum*, Fisch., occasional escape or in shrubberies.)
Coriandrum sativum, L., casual.
[2] Daucus Carota, *L.*, *except 78, 94, 107.*
D. gummifer, *Lam.*, 74, 80†, 98 (??), 101 (??).
Caucalis latifolia, L., casual in 92.
[*C. arvensis*, Huds., recorded, but unconfirmed, and probably in error, from 75, 83, 98.]
[3] C. Anthriscus, *Huds.* (*Torilis Anthriscus*, L.), *except 108, 111, 112.*
C. nodosa, *Scop.*, 74, 80, 81, 83, 85, 90, 92 cas., 94†, 102†, 106.

Araliaceæ.

Hedera Helix, *L.*, *except 111*† (?).

Cornaceæ.

Cornus suecica, *L.*, 88-90, 92, 94, 96-98, 105-108, 112.
C. sanguinea, L., † in 72, 77, 80-86, 88, 92, 95, 102.

Caprifoliaceæ.

Adoxa Moschatellina, *L.*, *except 78, 84, 85, 97, 101, 102, 103, 104, 107, 109, 110, 111, 112.*
Sambucus nigra, *L.*, *except 84, 110, 112*, but with † in 87-99, 106 (?), 107-109, 111, and probably should be marked so in others.

[1] *Æthusa Cynapium*, L., is a weed of cultivated ground, chiefly in gardens, wherever I have seen it in Scotland. It should probably be marked † in almost all, if not in all, the districts.

[2] *Daucus Carota*, L.—Though wide spread and often frequent in pastures may not be native in some of its recorded localities.

[3] *Caucalis Anthriscus*, Huds.—Near Aberdeen the localities in which this plant has been found are very suggestive of introduction by man; and the same probably holds true in other districts.

S. Ebulus, *L.*, 72, 73, 75, 77, 80, 81, 83†, 85, 89, 90† (?), 91† (?), 92† (?), 93† (?), 94† (?), 95†, 96†, 106†, 109†, 111.

[1] Viburnum Opulus, *L.*, 72-77, 80, 81, 82†, 83†, 85†, 87-89, 90†, 91† (?), 92† (?), 94†, 95-97, 99, 102†, 103-109.

V. Lantana, L., † in 75-77, 81, 83, 86, 90, 92.

Linnæa borealis, *L.*, 81, 83, 88-96, 107.

Lonicera Periclymenum, *L.*, *except 108, 109, 110, 111, 112.*

Rubiaceæ.

Rubia peregrina, L., a scarce casual, *e.g.* in 102.

Galium boreale, *L.*, *except 78, 79, 82, 83, 84, 101, 102, 110, 111* (?), *112* (?).

G. Cruciata, *Scop.*, *except 93* (?), *94* (?), *95* (?), *96, 97, 98, 102, 104, 105, 106, 107, 108, 109, 111, 112.*

G. verum, *L.*, all.

G. erectum, *Huds.*, 72, 81 (?), 83 (?), 87 (?), 88-90, 105, 106.

G. Mollugo, *L.*, 72, 73, 75, 77, 80-84, 87-89, 90† (?), 91† (?), 92† (?), 94†, 95†, 101.

b. insubricum (*Gaud.*), 89.

c. Bakeri, *Syme*, 74.

G. saxatile, *L.*, all.

G. sylvestre, *Poll.*, 72, 78, 80, 83, 86-90, 98, 108, 110, 111.

G. palustre, *L.*, all.

b. elongatum (*Presl.*), not infrequent.

c. Witheringii (*Sm.*), not uncommon, 72-74, 106-108.

G. uliginosum, *L.*, *except 82, 84, 95, 96, 101, 106, 107, 111, 112.*

[G. anglicum, *Huds.*, 80 (?)].

G. Vaillantii, DC., 83†.

G. Aparine, *L.*, all.

G. tricorne, Stokes, casual in 72.

Asperula odorata, *L.*, *except 78, 110.*

A. taurina, L., casual in 72, 81, Perthshire.

Sherardia arvensis, *L.*, *except 98, 104, 112.*

Valerianaceæ.

Valeriana dioica, *L.*, 72, 73, 75, 77 (??), 79-86, 99 (?), 108.

V. Mikanii, *Syme*, 111.

V. sambucifolia, *Willd.*, *except 112.*

V. pyrenaica, L., † in 72-74, 86†, Perthshire, 94, 111.

Centranthus ruber, DC., casual, in 87, 88.

Valerianella olitoria, *Poll.*, *except 79, 87* (?), *95, 97, 101, 104, 107.*

[1] *Viburnum Opulus*, L., is not rare in some parts of Scotland, but its situations are not beyond suspicion of human agency in its distribution in some of the districts.

V. rimosa, *Bast.* (*V. Auricula*, DC.), 85.
V. dentata, *Poll.*, weed of cultivation, 72-75, 77 (?), 80-83, 85, 87, 89, 90, 95†, 100, 110.

Dipsacaceæ.

Dipsacus sylvestris, *L.*, 72†, 73†, 74†, 75, 76, 77 (?), 81†, 83, 85, 86†, 87†, 89† (?), 90†, 92 cas., 95†, 99† (?), 100.
D. pilosus, L., 83†, 85†.
Scabiosa Succisa, *L.*, all.
S. Columbaria, *L.*, 72, 80-82, 86, 87 (?), 90, 92 (??).
S. arvensis, *L.*, *except 78, 97*† (?), *98, 101, 104, 106*† (?), *107, 108*† (?), *109, 110, 111*† (?), *112.*

Compositæ.

Eupatorium cannabinum, *L.*, *except 78, 79, 84, 92, 93, 94, 101, 103, 105, 107, 110, 111, 112.*
Solidago Virgaurea, *L.*, *except 78.*
b. cambrica (*Huds.*), Perthshire, 92, 97, 98, 104.
S. lanceolata, L., and *S. canadensis*, L., casuals in 88.
Bellis perennis, *L.*, all.
Aster Tripolium, *L.*, *except 77, 78, 79, 80, 88, (92 extinct), 94, 112.*
Erigeron canadense, L., casual in 88, 92.
E. acre, *L.*, 80†, 88.
E. alpinum, *L.*, 88, 90, 92.
Filago germanica, *L.*, *except 78, 84, 93, 98, 99, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112.*
F. minima, *L.*, *except 78, 97, 102, 103, 104, 105, 108, 109, 110, 111, 112.*
Antennaria dioica, *R. Br.*, *except 84.*
Anaphalis margaritacea, Benth. and Hook. f., casual in 88, 91, 92.
Gnaphalium uliginosum, *L.*, all.
G. sylvaticum, *L.*, *except 101.*
G. norvegicum, *Gunn.*, 89, 90, 92.
G. supinum, *L.*, 86-90, 92, 94, 96-99, 104-108, 111 (?)
Inula Helenium, *L.*, 74†, 97, 100† (?), 102† (?).
[I. Conyza, *DC.*, recorded in "Top. Bot.," with disbelief, for 89; no evidence of its occurrence there.]
I. crithmoides, *L.*, 73, 74.
Pulicaria dysenterica, *Gærtn.*, 74, 81, 82, 86, 87†, 100-102, 106.
Rudbeckia laciniata, L., beside the Tay, 88†, 89†.
Xanthium spinosum, L., casual in 92.
Bidens cernua, *L.*, 72-74, 76, 77, 80, 81, 83, 85, 87-91, 94, 95, 99-101.
B. tripartita, *L.*, 72-77, 83-89, 95, 100-102.
Galinsoga parviflora, Cav., casual in 92.

Achillea Millefolium, *L.*, all.
A. Ptarmica, *L.*, all.
Anthemis tinctoria, L., casual in 88, 89, 92.
[1] A. Cotula, *L.*, 72 esc., 77†, 80, 82, 83, 85, 88†, 89†, 90†, 99.
[1] A. arvensis, *L.*, 73†, 75†, 77†, 78, 80-85, 86†, 87-90, 92†, 95, 96, 106, 109, 111† (?).
[1] A. nobilis, *L.*, 73 esc., 75†, 79†, 81†, 100†, 102, 104, 109†, 111†.
[2] Chrysanthemum segetum, *L.*, *except 78, 79.*
C. Leucanthemum, *L.*, all.
C. Parthenium, Pers., †, recorded from all *except 74, 75, 97, 98, 101, 103, 104, 105, 107, 108, 110, 111, 112.*
Matricaria inodora, *L.*, *except 80.*
b. salina, *Bab.*, 72.
c. phæocephala, *Rupr.*, 112.
M. maritima, *L.*, 72-77, 81, 83, 90-104, 106, 109-112.
M. Chamomilla, L., 72 esc., 75†, 77†, 80†, 83†, 85†, 86†, 87 cas., 91†, 92 cas., 97†, 107†.
Tanacetum vulgare, *L.*, *except 78, 84, 98, 103, 105;* with † in 74, 91-97, 104, 106-112, and probably † in most others.
Artemisia Absinthium, *L.*, 81-84, 85†, 87† (?), 90† (?), 106, 111†.
A. vulgaris, *L.*, *except 78, 107.*
A. campestris, L., 85†.
A. maritima, *L.*, 73-75, 81, 82, 90, 91, 93.
Tussilago Farfara, *L.*, all.
Petasites fragrans, Presl., Perthshire†, 92†.
P. officinalis, *Mœnch* (*P. vulgaris*, Desf.), *except 107, 108, 109* (?), *112.*
P. albus, Gærtn., 86†, Perthshire†, 91†, 92†.
Doronicum Pardalianches, L., 72†, 73†, 77†, 84†, 86†, Perthshire†, 92†, 99†.
D. plantagineum, L., Perthshire†.
Senecio vulgaris, *L.*, all.
S. sylvaticus, *L.*, *except 84, 105, 110, 112.*
[3] S. viscosus, *L.*, 72-74, 75†, 76†, 77, 79, 80†, 81, 82†, 83, 85, 86, 87†, 88†, 89†, 90, 91†, 92†, 94, 99, 107†, 111 (?).
S. erucifolius, *L.*, 77, 80, 81.
S. Jacobæa, *L.*, all.
b. flosculosus (*Jord.*), 74, 88, 89.

[1] *Anthemis Cotula*, L., *A. arvensis*, L., and *A. nobilis*, L., have but little claim to be looked on as native in any part of Scotland where I have seen them. The mark † should follow a good many more of the above numbers.

[2] *Chrysanthemum segetum*, L., though often an extremely common weed of agriculture, could not hold its own anywhere in Scotland, probably, were it not for cultivation.

[3] *Senecio viscosus*, L., should have † after more of the districts recorded for it. It is hardly more than a casual in N.E. Scotland.

S. aquaticus, *Huds.*, all.
b. pennatifidus, *Gren.* and *Godr.*, 88, 89.
S. saracenicus, L., 72†, 73†, 74†, 75†, 91†, 92†.
[*S. Doria*, L., escape on bank of Tay at Barnhill; now extinct.]
Carlina vulgaris, *L.*, 72-75, 77, 79, 81, 90, 91, 93, 95†, 97, 100, 102, 104, 106.
Arctium Lappa, *L.* (agg.), *except 78, 97, 98, 103.*
A. majus, *Bernh.*, 73, 82 (?), 84 (?), 85 (?), 98†.
A. nemorosum, *Lej.*, 81, 83, 96, 99, 101, 105, 107, 109, 111 (?).
A. minus, *Bernh.*, *except 76, 77, 79, 80, 84, 91, 93, 94, 99, 103, 107, 112.*
A. intermedium, *Lange*, 72-74, 86, 88, 96, 98, 99, 105, 106, 109.
Carduus pycnocephalus, *L.*, 72-75, 77 (?), 79†, 80-83, 85-87, 90, 91, 93, 95 (?), 100 (?), 106, 112 (?).
C. nutans, *L.*, 77†, 79-83, 87, 89, 91 (?), 95†, 104, 106, 111 (?), 112†.
C. crispus, *L.*, *except 80, 93, 94, 97, 100, 103, 105, 107, 108, 109, 110, 111, 112.*
Cnicus lanceolatus, *Willd.*, all.
C. eriophorus, Roth., 77†, [84 (?), 85 (?), 87 (?)], 92†, [98 (?), 99 (?)].
C. palustris, *Willd.*, all.
[C. pratensis, *Willd.*, 75 (??).]
C. heterophyllus, *Willd.*, *except 74, 101, 111, 112.*
C. arvensis, *Hoffm.*, all.
b. mitis, *Koch*, 87-89.
c. horridus (*Adam*), 87-89.
d. setosus (*Bess.*), 86†, 87, 92, 93, 109.
[1] *Onopordon Acanthium*, L., 72 esc., 75, 77†, 80, 81†, 82, 83†, 85†, 87 cas., 112†.
Mariana lactea, Hill (*Silybum Marianum*, L.), casual in 74, 87-89, 92.
Saussurea alpina, *DC.*, 72, 87-90, 92, 94, 96-99, 101, 103-105, 107-112.
Serratula tinctoria, *L.*, 72, 73, 77 (?), 87†, 88† (?), 96† (?).
b. monticola (*Boreau*), 88† (?).
Centaurea nigra, *L.*, *except 110†, 111†, 112†.*
f. radians, 73, 74, 91, 92.
C. Scabiosa, *L.*, 76†, 77†, 80, 82, 85, 86†, 87†, 88-90, 92 cas., 95†, 96, 108.
C. Cyanus, *L.*, *except 79, 101, 102, 103, 104, 108, 110, 111 (?), 112 (?).* A field weed, probably † in all districts.
C. Calcitrapa, L., casual in 87, 92.

[1] *Onopordon Acanthium*, L., should probably be looked on as introduced by man in most districts in which it occurs in Scotland. Common in gardens, it is easily spread, and is an occasional casual in many places.

Cichorium Intybus, L., †, seldom more than a casual, in 72, 75, 77, 80-93, 95, 96, 99, 109.
Arnoseris pusilla, *Gærtn.*, a weed of cultivated ground, a doubtful native, 88 extinct, 90, 91, 92† (?), 93†, 94† (?), 95†.
Lapsana communis, *L.*, all.
Picris hieracioides, L., [77 (?)], 80†.
P. echioides, *L.*, 80†, 81, 82, 83†, 85†, 87† (?), 92 cas.

(*To be continued.*)

ZOOLOGICAL NOTES.

Note on a Female Gray Seal obtained on the East Coast of Sutherland.—A fine specimen of the Gray Seal (*Halichærus grypus*) drifted ashore at Golspie on the 21st ult. Through the kindness of Dr. Joass, the carcase was sent to Sir William Turner. It was a female, and had been shot or pierced by some missile in the abdomen. It was gravid, and the fœtus measured 19 inches in length. The skin has been preserved, and the fœtus and skeleton will forthwith find a place in the Anatomical Museum of the University of Edinburgh.—James Simpson, Edinburgh.

Notes on Dolphins in the Moray Firth.—About a month ago Mr. Craig, lighthouse-keeper, Covesea, near Lossiemouth, informed me that a large Dolphin had been stranded west of the lighthouse in June 1896, and was buried in the sand. From his description of the animal, I thought it might be a Risso's Grampus (*Grampus griseus*). I had it dug up, and secured the skull, which proved the species to be an old individual of the White-beaked Dolphin (*Lagenorhynchus albirostris*). It was quite fresh when interred. The skull measured as follows:—total length, 18½ ins.; breadth behind orbits, 10½ ins.; length of beak, 9 ins. Owing to age, most of the teeth had been lost.

A young specimen of the Pilot Whale (*Globicephalus melas*) was cast ashore dead, near Troup Head, Banffshire, in October 1896, and was buried by the coastguards. With their assistance, I had it dug up. I secured the head, which proves that the animal was not full grown. The skull measures:—total length, 21½ ins.; breadth behind orbits, 14 ins.; length of rostrum, 11 ins. Though this is a common Cetacean, I thought it useful to note the exact place where one was found, as no such record is given in Messrs. Harvie-Brown and Buckley's "Fauna of the Moray Basin."

It is now certain that the White-beaked Dolphin is to be found in the Moray Firth at any season of the year, as it has been found in January as well as June.—Wm. Taylor, Lhanbryde.

Late Stay of Fieldfares in Midlothian.—On 24th May this year I came across a small party of Fieldfares (*Turdus pilaris*) frequenting a mixed wood of beech and fir about half a mile south of Midcalder station. Fieldfares are generally numerous in certain localities on the Pentlands during April, but they rarely linger beyond that month.—Robert Godfrey, Edinburgh.

The Whinchat, Ortolan Bunting, and Pied Flycatcher in Shetland.—In the absence of Mr. Harvie-Brown, I had forwarded to me a single specimen of each of the above named species for identification. The birds were sent by Mr. Thomas Henderson, jun., from Dunrossness. All were adult males, and had perished on the 30th of April; and all are new to the avifauna of Shetland. Further interesting particulars concerning these and others observed during a remarkable visitation of migrants will be found in Mr. Henderson's note below.—Wm. Eagle Clarke.

Remarkable Visitation of Migratory Birds to Shetland.—We have had a most unusual and interesting visitation of birds. On the 11th of April the wind blew from the S.E., gently at first, but gradually increasing to a gale accompanied by heavy rain. I did not observe any arrivals beyond the usual species until the 15th, when, passing along the sheltered side of a stone dike, I observed a Goldcrest (*Regulus cristatus*). After this I observed a few strangers every day, and they gradually grew in numbers until the 30th, when they had increased to an astonishing extent. Behind every stone dike, burnside, or other shelter, there could be seen from 12 to 20 different kinds of birds. Among them I recognised Fieldfares (*Turdus pilaris*), Redwings (*Turdus iliacus*), Ring Ouzels (*Turdus torquatus*), Redbreasts (*Erithacus rubecula*), Redstarts (*Ruticilla phœnicurus*), Goldcrests, Pied Wagtails (*Motacilla lugubris*), Chaffinches (*Fringilla cœlebs*), Short-eared Owls (*Asio accipitrinus*) two seen, Ring Dove (*Columba palumbus*) one seen, and the commoner species. There must have been three Redbreasts to every one of other kinds. I only observed one Pied Flycatcher (*Muscicapa atricapilla*), two Ortolan Buntings (*Emberiza hortulana*), and one Whinchat (*Pratincola rubetra*), and these being strangers, they were kindly named for me by Mr. Eagle Clarke of the Edinburgh Museum. There were several other kinds that I did not know the names of, though I could approach within a few yards of them, so exhausted were they with the wind. One of them was rather bigger than a Starling, colour yellow, wings and tail dark coloured. Could this have been a Golden Oriole? An Osprey (*Pandion haliætus*) was fishing in Loch Spiggie on the 2nd of May. So far as I can ascertain, we have had more birds here than elsewhere in Shetland. This is accounted for by the fact that we are situated near the south, and on the west side of the island. The wind, coming from the south-east, blew them right on to us, and they

found no shelter until they came to the west side. By the 5th of May they had almost entirely disappeared. On the 20th of May I observed a good number of Spotted Flycatchers (*Muscicapa grisola*) and one Hedge Accentor (*Accentor modularis*); and on the 4th of June a male Siskin (*Chrysomitris spinus*).—Thomas Henderson, jun., Dunrossness, Shetland.

The Blue-headed Wagtail in Lanarkshire.—It has been my regular practice at the spring migration during the past decade to visit the banks of the Clyde, east of Glasgow, to note the appearance of our summer visitors. The district referred to, as long since pointed out by Gray, is regularly visited by a large colony of Yellow Wagtails. On the 24th of April this year, on a little patch of vegetation in the stream below Cambuslang, I saw with my binocular, at about fifteen yards from the river bank, what I had supposed was a Yellow Wagtail, but it proved to have, to my surprise, a gray-blue head. It removed to another patch of vegetation at no distance from the first, but presented, as before, its back elevation, and in a minute afterwards flew to a tree on the right bank of the stream, whence it went to the fields on that side. I returned to this neighbourhood on the following evening, and had the good fortune, after waiting a little, to see the bird of the previous day on a patch of green close to the right bank. It shifted after an interval to one of the islets near the left bank, where I saw it quite favourably, noting anew the gray-blue head and the snow-white line over the eye, which, by the way, when seen directly in line with the spectator, gave the head a curiously puzzling appearance as it was slightly diverted to right or left. The bird in appearance was a cock Yellow Wagtail with the conspicuous differences mentioned, and being quite familiar with the yellow head of *Motacilla raii* I could not make the mistake of confusing *M. flava* with its congener. To give an idea of the richness of this district in Wagtails at this season, I may say that on the forenoon of the day on which I saw *M. flava* I also saw half a dozen *M. raii*, as many *M. alba* and *M. lugubris*, and a pair of *M. melanope*. After the 25th I did not again see the Blue-headed Wagtail, but the river was in partial flood for some days thereafter, and the "islets"—patches of vegetation which indeed scarcely deserve the name—were covered. On the 15th of May I saw about twenty *M. raii* on the river-bank over a stretch of three or four miles.—John Paterson, Glasgow.

Golden Oriole in Forfarshire.—This morning (8th June) we had brought to us a specimen of the Golden Oriole (*Oriolus galbula*), a female, in most excellent plumage. The story which accompanied it was to the effect that it had been flushed at dusk (about 9 P.M.) the previous evening, in a narrow strip of wood about two miles north-east of Arbroath and about a mile from the sea; and that, on being disturbed, it had flown against a tree trunk and injured itself.

There were no marks of any violence upon it. On dissection, the ovaries were found to be somewhat enlarged. Two examples of this species, believed to have been shot in the district about 1855, are in Montrose Museum. So far as we have heard, there are no other records for north-eastern Scotland.—T. F. and W. J. Dewar, Arbroath.

Red-backed Shrike in Forfarshire.—On the morning of 21st May I noticed a male Red-backed Shrike (*Lanius collurio*) on the farm of West Kirkton about half a mile from Arbroath. It was not at all shy, and was under observation, usually at a distance of within twenty or thirty yards, for half an hour. It flew from post to post of a wire fence. When at last it flew off over the field, it was accompanied by another bird which, I thought, might be its mate. In the evening of the same day I saw it again. Next day I found both birds together, and so tame that I was able to observe them for several minutes. In the afternoon my brother visited the spot and saw the male bird only. On each of the six following days I visited the place, but no further sign of either bird was seen. I have never seen the species farther north than the Farne Islands, on which I observed one in May 1892. It seems to be extremely rare in this county, there being only one record, that of a specimen shot near Montrose about 1864.—T. F. Dewar, Arbroath.

[An adult male Red-backed Shrike was seen at Innerwick in East Lothian on the 25th of May. These birds were probably migrants on their way to their breeding-haunts in Scandinavia.—W. E. C.]

The Goldfinch in West Lothian.—It may be interesting to note that on the 1st of January last I saw three Goldfinches (*Carduelis elegans*), in company with a number of other birds, on an elm tree in a field near East Craigie Farm, Dalmeny Park; and on the 19th February I saw a single bird of this species very near the same place.—Bruce Campbell, Edinburgh.

Note on the Siskin in Kirkcudbright.—These pretty little birds have become rather uncertain visitants to our neighbourhood within recent years. Formerly they were more regular, and a few nested in certain localities. Indeed, the species was found nesting in Britain for the first time in the woods of Shambellie, adjoining the picturesque little village of Newabbey. During March several flocks and lesser parties of Siskins were noted in the seaward parishes of the Stewartry.—R. Service, Maxwelltown.

Curious Nesting-site of the Marsh Titmouse.—Whilst walking along the bank of the Fiddler's Burn, near Braidwood, Lanarkshire, on the 28th May, one of my companions directed my attention to what seemed a mass of rubbish on a tree growing on the opposite bank of the stream. Thinking it well to make

certain of its nature, he threw a stone into the tree, upon which a little bird slipped quietly out as if off its nest. Our curiosity was now aroused, and we crossed the stream, only to find, however, that the tree, which overhung the water at a height of some forty feet, was in an advanced state of decay. Notwithstanding this, one of the party climbed to the nest, which was built in a fork of the tree just where it bent right over the stream. So exceedingly shy were the owners of the nest, and so bad was the light, that it was with the greatest difficulty, and only after a wearisome wait, that we discovered that they were Marsh Tits (*Parus palustris*). One of the party who is familiar with the peculiar note of the bird had asserted from the very first that the nest belonged to that species; but I determined, if possible, to place the matter beyond dispute. The nest, except that it is larger than usual, is quite normal. So far as I am aware, this is the first authenicated case on record of the Marsh Tit nesting in an exposed situation. What is perhaps more wonderful still is the fact that the eggs are exceptionally large. The largest specimen measures .77 × .59 in., while the average dimensions of the clutch are .74 × .59 in.! Most leading British authorities give .65 in. as the maximum length of eggs of this Tit; while the longest specimen in the famous Rey collection at Leipzig measures 17.0 mm.—J. B. Dobbie, Edinburgh.

Hybrid Crows in the Forth Area.—This season I have examined two specimens of Crows in intermediate plumage between the typical *Corvus corone* and the northern form *C. cornix*. The first was shot about the middle of May from a nest in S.W. Perthshire; it had neck and shoulders gray, but was otherwise in the plumage of a typical Carrion Crow, to one of which birds—also shot—it was mated. The second was shot from a nest near Listonshiels, Pentland Hills. It had a ring of gray round the lower neck, extending to an inch in breadth on the upper back, and the whole plumage of the lower back was interspersed with gray feathers; its mate was not secured, but appeared to be a typical Carrion Crow.—Robert Godfrey, Edinburgh.

The Jay in Dumfriesshire and Kirkcudbright.—The large number of these birds that found their way to Dumfriesshire and the more easterly parts of the Stewartry during the past winter have been singularly lucky in avoiding the fate usually meted out to such as hold a reputation (ill-deserved it may be) like theirs. From all I can learn, not more than two or three dozen of them seem to have been shot. Some few of them may remain, and, if good luck continues, may breed. The vast majority have, however, disappeared quietly. Doubtless they are returning to the forests of North-Eastern Europe, from whence they set out in October last. Outside the western boundaries of the Nithsdale water-shed, these Jays hardly seem to have been noticed. A couple were shot near

Kirkcudbright. A few were seen in Eskdale. Practically they were confined to Annandale and Nithsdale, especially the first named. I have notes and estimates from a good many correspondents that make up a total of rather more than 300 Jays seen. Such an immigration is rather a unique event.—R. SERVICE, Maxwelltown.

Wryneck at the Island of Foula, Shetland.—On the 30th of April a Wryneck (*Iynx torquilla*) was captured alive in a byre, where it had evidently sought shelter, on this island. It died about an hour afterwards, and I sent the specimen to the Museum of Science and Art, Edinburgh.—ADELAIDE L. TRAILL, Island of Foula.

Hoopoe at the Isle of May.—A Hoopoe (*Upupa epops*) was obtained by the lightkeepers at the Isle of May on the 30th of April last, and was forwarded to me for preservation, and proved to be an adult female.—R. SMALL, Edinburgh.

Great Spotted Woodpecker in Peeblesshire.—The gamekeeper at Hallmyre informs me that he saw a Great Spotted Woodpecker (*Dendrocopus major*) in a wood on that place on the 15th May last. The observer (who knows the species) was directed to the bird by its loud tapping on the dead limb of an old pine, and it allowed him to approach sufficiently close to distinguish the red on the nape of the head. I may mention that two birds of the above species were seen in Castle Craig woods about two years ago.—T. G. LAIDLAW, Edinburgh.

The Marsh Harrier in Dumfriesshire.—This very rare species occurred early in May, a fine old male having been shot at a place in Kirkmichael. I had the pleasure of examining the bird while it was still in the flesh. Probably it may have been a comparatively common bird in this country at one time. If so, the period must have been rather remote. In the present conditions of agriculture and game preservation, such a species as the Marsh Harrier is inevitably doomed. So it is merely a rare straggler now. This individual is the first local specimen that has been obtained within the last thirty years.—R. SERVICE, Maxwelltown.

Iceland Falcon in Shetland.—An immature male Iceland Falcon (*Falco islandus*) was obtained at Ollaberry, near Lerwick, on the 6th of April last, and was sent to Mr. Robert Small, Edinburgh, for preservation.—EDS.

Destruction of Ospreys.—"Three weeks ago a pair of these splendid birds came to Lochan Eilean, on the estate of Rothiemurchus, in Strathspey, and took up their abode in the ruined castle in the lake, where for years they have bred in security. A few days after their arrival, they were joined by a third Osprey (probably a male bird). Then began a battle royal. For three days two of them fought, whilst the third perched unmoved on the castle wall.

They towered and stooped and manœuvred in the air, and they attacked each other fiercely on the wall and on the shore, until at length one fell dead into the lake. The victor was seen to fly heavily to the castle wall. Next day it had disappeared, and but a solitary bird now remains."—J. B. G. in "The Field," 21st May 1898, p. 745.

Ring Dove nesting in the City of Edinburgh.—Perhaps the following may be of some little interest to you. A friend of mine, who lives in a pretty crowded suburb of Edinburgh, informs me that a pair of common Wood Pigeons (*Columba palumbus*) are nesting in a horse-chestnut tree which grows alongside a large tenement of houses. Is this not rather an uncommon thing, considering the shyness of this species? You can rely upon this information being correct, and if you think it worth while to make a note of it you are welcome to do so.—Arch. Craig, Edinburgh.

[Although this species is a well-known bird in the parks and gardens of London, Paris, and elsewhere, it has rarely, we believe, bred in the city of Edinburgh.—Eds.]

Mode of Progression of the young Waterhen on Land.—In crossing a Caithness flow, tenanted by a colony of Black-headed Gulls, on 6th June last, I put up a Waterhen (*Gallinula chloropus*) from a tuft of rushes. As the gulls' nests seen up to that time were all empty, I thought it useless to halt and look for the Waterhen's, but ere I had gone far I heard the distinctive call of a downy Waterhen, and I noticed a youngster resting on a wet patch between rush beds. The bird was only a day or so old, and it answered fearlessly and repeatedly my efforts to imitate its cry. It proceeded across the damp ground "on all fours," using its stumpy wings like hands, stretching them forward alternately to catch on the stems of grasses or rushes, and moving forward thus with a floundering gait, keeping its belly on the ground as it proceeded. The deliberate use of the wings *alternately* seemed to me the most interesting point of the observation, as, of course, such a use of a bird's wings in flight is impossible. The adult Waterhen at times exhibits a most remarkable side to side motion of his body in flight, in consequence of his running and flying simultaneously. In connection with this note, it is interesting to compare an account of the downy Little Grebe's method of progression on land, as recorded by Professor Newton in the "Ibis," 1889, and quoted by Mr. Tegetmeier in "The Field," 4th June 1898. Professor Newton shows that this bird, when recently hatched, depends quite as much on its wings as on its legs in impelling itself forward on land. I may say that I had not had the opportunity of seeing Professor Newton's note till after I had made the above observation on the young Waterhen.—Robert Godfrey, Edinburgh.

Early Hatching of the Tufted Duck in Caithness.—The Tufted Duck (*Fuligula cristata*) is one of our latest nesting species of Duck, the normal time for laying in Scotland being the first week in June. In Midlothian the earliest date on which I have seen the young is 25th June. I was therefore surprised to find this season in Caithness a female attended by nine young on a "dhuloch," on 6th June; in this case the bird must have begun to lay by 4th May at latest. Not only the date, but also the locality of the Caithness nesting-haunt referred to is interesting: the bird was frequenting a small peat-hole partially overgrown with bog-bean. Though such nesting-haunts are not unknown in other parts of Scotland—there being one such summer station in Midlothian—they are the exception.—Robert Godfrey, Edinburgh.

The Viper in the Pentlands.—During an excursion of the Scottish Natural History Society to Auchencorth Moor on the 7th of May, one of the party, Mr. Charles Traill of Edinburgh, killed a Viper. The specimen measured 26 inches in length, and weighed exactly 1 lb. As the Viper appears to be of very rare occurrence in the Pentlands and in the Forth district generally, this capture may be worthy of record.—J. B. Dobbie, Edinburgh.

On the occurrence of Cyclops nanus, *G. O. Sars*, and Cyclops languidus, *G. O. Sars*, in Loch Doon, Ayrshire.—These two species of *Cyclops* were obtained in a shore gathering from Loch Doon, collected by means of a hand-net on the 31st of March last. *Cyclops nanus* is, as the name signifies, a small species, and in this case might have been the young of a larger kind, but as several of the specimens carried ova, there could be little doubt as to their being mature. Professor G. S. Brady, to whom I submitted specimens, considered them to be identical with the *Cyclops nanus* described by Professor Sars. There does not seem to be any British record for *C. nanus* previous to this. It may also be remarked that in *C. nanus* the antennules are eleven-jointed. *Cyclops languidus* is also comparatively a small species, and though it has previously been recorded from England, this is, I think, the first record of its occurrence in any Scottish freshwater loch. *C. languidus* belongs to the group distinguished by having the antennules seventeen-jointed, but in this species the third and fourth joints are coalescent, so that the antennules appear to have only sixteen. This coalescing and subdividing of the joints of the antennules is an interesting feature in *Cyclops*, and has given rise to a considerable difference of opinion as to whether certain species are "true species," or merely "forms" of some species having the full complement of joints. Even in the present instance there appears to be a tendency on the part of some authors to consider *Cyclops nanus* as a modified "form" of *C. languidus*, and in view of this it is somewhat significant that both forms were found in the same gathering from Loch Doon.—T. Scott, Leith.

Records of Scottish Land and Freshwater Mollusca.—Since the publication, in the July 1895 number of this magazine, of Mr. Roebuck's last list of additions to his 'Census of the Land and Freshwater Mollusca of Scotland,' I have sent to Mr. J. W. Taylor of Leeds, for "authentication," a number of specimens constituting fresh county records. Others, no doubt, have also sent similar data from Scotland to the Conchological Society's referees during the period, and I hope Mr. Roebuck will ere long favour us with a continuation of his useful supplements. Meantime it can do no harm for me to mention some of the records I have myself supplied :—

Limax cinereo-niger.—One well-grown specimen under bark on an old fir log in Rosslyn Woods, county of Edinburgh, 30th April 1898. This is an interesting addition to the county list.

Succinea putris.—Philipstoun, Linlithgowshire, October 1896, a few; Dollar, Clackmannanshire, April 1897, several.

Hyalinia pura.—Near Macbiehill, Peeblesshire, February 1896, a dozen.

Hyalinia radiatula.—Near Macbiehill, Peeblesshire, February 1896, a few.

Helix lamellata.—Yester grounds, Haddingtonshire, September 1896, common. I have already recorded this in the "Annals" (1897, p. 47).

Helix granulata (=*sericea*, Jeff.).—Longniddry, Haddingtonshire, February 1896, abundant among hemlock, etc.; Yester, in same county, September 1896, two specimens; banks of stream flowing out of Kinghorn Loch, Fife, March 1896, a few dead shells.

Helix fusca.—Pressmennan and Elmscleugh, Haddingtonshire, September 1894; Yester, in same county, September 1896; Carribber Glen, Linlithgowshire, February 1898, a few; Causeway-end, near Manuel, Stirlingshire, March 1898, common.

Vertigo antivertigo.—Banks of stream flowing out of Kinghorn Loch, Fife, March 1896, fairly common (Mr. T. Scott has recorded it from Largo, and from *post-tertiary* deposits at Elie—see "Scot. Nat.," 1891, p. 50); Pass of Aberfoyle, West Perth, April 1896, a good many.

Vertigo substriata. — Dreghorn Glen, Pentland Hills, near Edinburgh, March 1897, one specimen. I have already recorded this in the "Annals" (1897, p. 126).

Clausilia bidentata, Strom. (=*rugosa*, Drap.).—Banks of the Avon, below Carribber, Linlithgowshire, February 1898, a few, including one of var. *Everetti.*

Limnæa glabra.—Rosslyn Curling Pond, near Edinburgh, October 1897, fairly common.

Sphærium lacustre.—Rosslyn Curling Pond, near Edinburgh, October 1897, tolerably common.

Specimens of the following species, which are not entered for Berwickshire in the "Census," were also sent by me to the referees from that county in 1895 (see my paper on Berwickshire Land and Freshwater Mollusca in "Proceedings Berw. Nat. Club," vol. xv., 1894-95):—*Agriolimax lævis*, *Succinea elegans*, *Helix arbustorum*, *Helix granulata*, *Helix fusca*, *Pupa anglica* (=*ringens*, Jeff.), *Vertigo pygmæa*, *Clausilia bidentata*, and *Limnæa truncatula*.

I may add that on 12th February last I found *Azeca tridens* in some numbers on a mossy bank near Bridge of Allan, West Perth. It was first found in this locality by Mr. Foulis in 1868 (see "Proc. Glasgow Nat. Hist. Soc.," i. 240); and rediscovered by Mr. A. M'Lellan, Stirling, in April 1896. I hunted it up independently.—William Evans, Edinburgh.

BOTANICAL NOTES AND NEWS.

Botanic Garden in Aberdeen.—A most valuable addition has been made to the facilities for the study of Botany in Aberdeen by the gift of £15,000 for the formation and upkeep of a Botanic Garden in Old Aberdeen. Miss Anne H. Cruickshank, daughter of a former Professor of Mathematics in Marischal College and University, has connected this gift with the memory of her late brother, Dr. Alexander Cruickshank, an ardent student of natural science, and a successful student despite physical defects from infancy that would have crushed a weaker nature. The object of the gift is to promote higher teaching and research in Botany, and the administration is committed to six Trustees (the Principal of the University and the Professors of Botany and of Mathematics, all *ex officiis*, and three others named personally), who shall use the proceeds to further botanical teaching and study within the University of Aberdeen, and shall also permit the access of the public to the Garden under suitable regulations. A year or so must elapse before the Garden can be equipped, but it should prove a valuable aid to botanical research in Aberdeen.

Claytonia perfoliata, *Don.*—This North American plant, which is common in some parts of England, but rare in Scotland, was found by Mr. A. Calder of Portobello, thoroughly established at Portincross, near Kilbride in Ayrshire, in May 1898. It is recorded in Dr. F. Buchanan White's "Flora of Perthshire," but in no other of the published local Floras of Scotland.—A. B. Steele, Edinburgh.

[See "Ann. Scot. Nat. Hist.," 1898, p. 102.—Ed.]

Mosses and Hepatics near Edinburgh.—The following rather rare mosses and hepatics have recently been collected in the neighbourhood of Edinburgh by Mr. Alister Murray and Mr. Charles

Scott, members of the Edinburgh Field Naturalists Society, either at the Society's excursions or when botanising alone. **Musci.**—*Grimmia subsquarrosa* on Arthur Seat, April 1898; *Orthodontium* (*Stableria*) *gracile* in Roslin Glen, March 1898; *Fissidens pusillus* at Arniston, October 1897; *Heterocladium heteropterum* near Bavelaw, March 1897; *Hypnum falcatum* at head of Bonaly Burn, December 1897; *H. patientiæ* south of Swanston, Pentland Hills, March 1896, rare in fruit. **Hepatics.**—*Porella lævigata*, Bonaly Burn and Craiglockhart, December 1897; *Cephalozia catenulata*, Habbie's Howe, February 1898.—A. B. Steele, Edinburgh.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1898.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Badgers in Dumfriesshire. By W. D. Currie. *The Field*, 28th May 1898, p. 787.—Three specimens captured lately in the Parish of Canonbie.

Notes of 1897 [Lepidoptera]. By A. Horne, F.E.S., A. A. Dalglish, and E. M. Cheesman. *Ent. Record*, vol. x. pp. 79-85 (March 1898).—A large number of Scottish records are included in these notes, from Rannoch, South-West Scotland, and Orkney.

Acherontia atropos in Orkney. By E. M. Cheesman. *Ent. Record*, vol. x. p. 85 (March 1898).—Specimen captured at Stromness on 3rd September 1897.

Some Notes on Oporabia autumnata, Bork. By Louis B. Prout, F.E.S. *Ent. Record*, vol. x. pp. 93-95 (April 1898).—The notes refer in great part to specimens from Rannoch, Aberdeen, and Glasgow.

Ten Weeks at the foot of Beinn Doireann (Ben Dohoran) in search of Caddis Flies in 1897. By James J. F. X. King, F.E.S. *Ent. Mo. Mag.* (2), vol. ix. pp. 134-135 (June 1898).—A list of thirty-one species is given.

Two new Hydroptilidæ from Scotland and Algeria respectively. By Kenneth J. Morton, F.E.S. *Ent. Mo. Mag.* (2), vol. ix. pp. 107-109 (May 1898).—Hydroptila sylvestris, n. sp., described from specimens taken in July by beating pine trees on the shores of Loch Morlich, Glen More, Inverness-shire, at an elevation of 1046 feet.

Diptera from Suffolk, Aberdeen, etc. By E. N. Bloomfield. *Ent. Mo. Mag.* (2), vol. ix. p. 138 (June 1898).

Oxycera dives, Loew., at Rannoch, and notes on the genus. By C. W. Dale. *Ent. Mo. Mag.* (2), vol. ix. p. 88 (April 1898).—Specimen taken on 18th June 1896.

Supplement to "A Synopsis of British Psychodidæ." By Rev. A. E. Eaton, M.A., F.E.S. *Ent. Mo. Mag.* (2), vol. ix. pp. 117-125 (May and June 1898).—Psychoda phalænoides, Linn., and P. albipennis, Zett., are recorded from Loch Maree.

BOTANY.

Biographical Index of British and Irish Botanists (First Supplement). By James Britten and G. S. Boulger. *Journ. Bot.*, 1898, pp. 145-149, 192-195.—The above instalments extend from Bobart to Higgins.

Notes of a Tour in N. Scotland, 1897. By Rev. Edward S. Marshall and W. A. Shoolbred. *Journ. Bot.*, 1898, pp. 166-177.—The results of a visit from 14th July to 12th August 1897, in Vice-counties—Caithness (109), West Sutherland (108), East Sutherland (107), East Ross (106), and Elgin (95). It contains numerous new records.

Scottish localities for Euphrasia foulaensis, Townsend. By Rev. Edward S. Marshall. *Journ. Bot.*, 1898, p. 150.—Based on his own gatherings, and on the Boswell-Syme and Hanbury herbaria. The localities noted are in Mid-Perth (88), S. Aberdeen (92), W. Sutherland (108), Caithness (109), Orkney (111).

Experiments in Cross-Fertilisation of Salices. By Edward F. Linton. *Journ. Bot.*, 1898, pp. 122-124.—Descriptions of artificially produced hybrids, viz. *S. Caprea* × *lanata*, *S. cinerea* × *Myrsinites*, and *S. lanata* × *repens*.

Carex helvola, Blytt, on Ben Lawers. Recorded by Mr. G. C. Druce at meeting of Linnean Society on 3rd March 1898. *Journ. Bot.*, 1898, p. 157.

New or Rare British Fungi. By Annie Lorrain Smith. *Journ. Bot.*, 1898, pp. 180-182.—Enumerates the following, sent by D. A. Boyd from Seamill in Ayrshire (except O. Bistortæ), and believed by the writer to be new to Britain:—*Pseudophacidium Callunæ*, Karst., on dead branches of *Calluna vulgaris; Stictis stellata*, Wallr., on dead stems of *Eupatorium cannabinum; Thyrsidium hedericolum*, Dur. and Mont., var. *Carpini*, Sacc., on dead branch of *Carpinus Betulus; Ovularia Bistortæ*, Sacc., on *Polygonum Bistorta* from Kilmarnock; and *Ramularia Valerianæ*, Sacc., on *Valeriana officinalis*. [Of the above at least *Ovularia Bistortæ*, *Ramularia Valerianæ*, and *Thyrsidium hedericolum* have been previously recorded from near Aberdeen.—J. W. H. T.]

REVIEWS.

AUDUBON AND HIS JOURNALS. By Maria R. Audubon. With Zoological and other Notes by Elliott Coues. In two volumes. (London: John C. Nimmo, 1898.)

In the literature of the American people there is no name which justly ranks higher than that of the brilliant French-American naturalist John James Audubon.

Now nearly half a century since his death his grand-daughter Maria R. Audubon has given his scientific admirers in many lands two large octavo volumes, excellent of their kind, and has for the first time brought together a most carefully prepared biography of the great naturalist, his life and works, as well as the full text of those famous "Journals" and the "Episodes."

In this now standard work the Missouri Journal is nearly new, the Labrador and European ones largely so. The second volume contains the "Episodes," and these have not been before collectively printed in English.

The zoological notes by Dr. Elliott Coues, who has greatly assisted with the work, add much to its value and interest.

Audubon's fame as a naturalist rests on his great and magnificent work *Birds of America*, in four massive folio volumes, containing 435 plates, the first part of which appeared in London in 1827, finally to be concluded in 1838. This was subsequently followed by quite a distinct octavo edition in seven volumes, published 1840-44. The price at which the *Birds of America* was issued made the work an article of luxury, and precluded its appearance in libraries except those of the most wealthy, thus placing the varied information beyond the reach of the great body of working naturalists.

Audubon, although a most accurate observer of nature, had little claim to be considered a scientific naturalist. His great powers consisted in his skill with pen and brush in describing and depicting bird life as he saw it out of doors. He was a painter first, a naturalist afterwards. Perhaps, judging by the standard of recent days, his magnificent plates fail through defective drawing, and he has chosen an exaggerated attitude and position for his subjects, such as are not seen in nature, or are not in accord with the ideas of the ornithological artists of the present day.

In 1826 Audubon visited Europe, landing in Liverpool in July of that year, and it was then that he became acquainted with the Rathbone and Roscoe families, from whom he received much kindness.

Afterwards in Edinburgh and the North of England he became intimate with Professor Jameson, John Prideaux Selby of Twizel, Lizars the engraver, Sir William Jardine, Bewick, Sir Walter Scott,

and a host of distinguished literary men. This portion of the European Journal is of much interest.

In the autumn of 1830, Audubon and his wife, coming from America, returned once more to his old quarters in Edinburgh, and then began that "Ornithological Biography" in which he was so immensely assisted by William Macgillivray—how much so we may know by what his countryman Dr. Coues has written (*Key to North American Birds*, 2nd ed., 1884, p. 22): "Vivid and ardent was his genius, matchless he was both with pen and pencil in giving life and spirit to the beautiful objects he delineated with passionate love; but there was a strong and patient worker by his side—William Macgillivray, the countryman of Wilson, destined to lend the sturdy Scotch fibre to an Audubonian epoch. The brilliant French-American naturalist was little of a 'scientist.' Of his work the magical beauties of form and colour and movement are all his; his page is redolent of nature's fragrance; but Macgillivray's are the bone and sinew, the hidden, anatomical parts beneath the lovely face, the nomenclature, the classification—in a word, the technicalities of the science."

In concluding this short and imperfect notice of Miss Audubon's charming volumes, we feel assured that the life-work of the great naturalist will abide, and his memory continue a joint heritage of the English-speaking people on each side of the Atlantic, so that the name and fame of Audubon will live in the hearts of the generations which follow. J. C.

Flora of Perthshire. By Francis Buchanan W. White, M.D., F.L.S., F.E.S. Edited, with an Introduction and Life of the Author, a list of his Scientific Publications, and an Appendix, by James W. H. Trail, A.M., M.D., F.R.S. (Printed for the Perthshire Society of Natural Science by William Blackwood and Sons, Edinburgh.)

Those interested in the Botany of Scotland were aware that the late Dr. Buchanan White had for several years been engaged in the preparation of a "Flora" of his native county, and have anticipated the issue of the work by himself. Few know any district so varied as Perthshire as he knew it, and the width of his interests in botanical problems, and also in zoology, gave promise of a work of much value. Much of the manuscript of the systematic section was drafted into shape a good many years ago; but Dr. White felt that additional information was required on many points before he could regard it as ready for publication. Illness, leading to his death, put a barrier to the further progress of his work. The Council of the P.S.N.S. felt that it would be a misfortune if the result of Dr. White's investigations were lost, especially as it was believed that the MS. was virtually ready to be placed in the printer's hands. Arrangements were made to have it printed, and the editor undertook to

revise the proofs and to prepare a short account of the author's life and scientific work.

It was soon found that the manuscript was less ready than had been supposed. Many additions had been made on the sheets, and required to be put in place and verified, and queries required to be solved. Several critical genera had been left for subsequent treatment, and were not represented at all, or only by brief and fragmentary notes. It was clearly necessary to endeavour to fill these gaps, as far as practicable, on the same general plan as that followed by the author. The doing so has delayed a good deal the appearance of the volume.

Though the book has inevitably suffered from its author not having been able to prepare it finally for publication, and to give it the benefit of personal revision, its value as a local flora will be recognised as entitling the Council of the Perthshire Society to the gratitude of a much wider circle than those interested in Perthshire alone. The accuracy of the author's many personal observations recorded here give it a permanent value to all interested in the British flora.

Synopsis Characearum Europæarum. By Dr. Walter Migula. (Leipzig: Eduard Kummer, 1898.)

Though primarily intended for the flora of Middle Europe, and written in German, this work ought to be welcomed by every botanist desirous to become acquainted with the *Characeæ* of any region of the world. It will be found most useful, as it gives a key to all European species and varieties, with short and good descriptions. There are 133 excellent woodcuts, many of them of full-page size, and by far the most including numerous figures in each woodcut. Every European species except *Tolypella hispanica* is figured, as are also many of the varieties. An introduction explains and illustrates the structure of the group, and gives information as to collecting and examining the species. There is also a valuable index to the literature of the *Characeæ* and to the chief published sets of specimens. The work is based on Dr. Migula's well-known volume on these plants in Rabenhorst's "Kryptogamenflora." Though not so full in its treatment as the latter, it is more convenient for general use.

County and Vice-County Divisions of the British Islands. A useful sheet under this title has been issued by Mr. A. Somerville, after consultation with many botanists and zoologists interested in the distribution of British plants and animals. It gives in brief and convenient form the divisions recognised by Mr. H. C. Watson, with notes on the divisions of the larger counties and on the effects of later legislation on the county boundaries and on the divisions. It is in a form suited for hanging up for ready reference, and should be found useful by all biologists in Britain.

Coloured Figures of the Birds of the British Islands. Issued by Lord Lilford, F.Z.S., etc. (Concluding Notice.)

It must be a matter for congratulation to the subscribers to the late Lord Lilford's beautiful volumes who have lived to see the conclusion of the work. The first number was issued in October 1885; the concluding in the spring of 1898. Lord Lilford's death took place on 17th June 1896, on which date nearly all the remaining plates were in an advanced state of preparation, and only the letterpress remained to be issued.

Friends who knew the gifted author were aware that his cheerfulness never left him, and that although worn with the increase of bodily infirmities, and alas too often racked with pain, his interest in his work never flagged, but remained fresh and perfect to the end of a gentle and blameless life.

The plates were intended to be the main feature of the work, and undoubtedly the beautiful drawings by Thorburn, Keulemans, Lodge, and Neale must ever remain a joy to the possessors, and a credit to nineteenth-century art. The letterpress, eminently original, and drawn from Lord Lilford's varied experiences, or that of friends on whom he could rely, forms an admirable setting to the illustrations.

The concluding number (xxxvi.) contains a welcome portrait of Lord Lilford, title pages, list of subscribers, and a preface memoir, written with much feeling, by his old friend Professor Newton, to whom the work is dedicated with affection and respect.

The letterpress of the four concluding numbers was supplied by the late Osbert Salvin, F.R.S., and confined to a brief statement of the claims of each species to be considered a British bird, and its geographical distribution. And now he too has left us, and one more illustrious ornithologist of that fast diminishing brotherhood who were the original promoters and founders of the British Ornithologists Union has passed to the other side.

We cannot live back into the past, and memory alone can quicken faces and voices once familiar; but the life-work of our comrades remains, and, like these beautiful volumes of Lord Lilford's, will abide a treasure, a joy, and an example, when new generations of bird-lovers seek out the paths of the old. J. C.

The Annals
of
Scottish Natural History

No. 28] 1898 [October

EARLY MAN IN SCOTLAND.[1]

By Sir William Turner, D.C.L., LL.D., F.R.S.

(*Continued from p.* 146.)

The association of bronze objects, both with short cists and cinerary urns, establishes these forms of interment as practised at a time when bronze was the characteristic metal used in many purposes of life. The crouching attitude of the dead body, the contracted grave, and the varieties of urns already described, are therefore to be regarded as equally characteristic of this period, even if bronze is not found in a particular instance associated with the interment, and this view is generally held by archæologists in Scotland.

In a preceding paragraph implements and weapons made of stone, flint, and bone were referred to as having been sometimes associated with bronze, and also of similar objects having been found in graves, in which, though obviously of the same class and period, no article made of metal was observed. Such an association proves that there was no sharp line of demarcation between the employment of the more simple substances used by Neolithic man in the

[1] An Address delivered at the Royal Institution of Great Britain, on the 26th March 1897.

manufacture of implements and weapons, and the use of bronze for similar purposes. The two periods undoubtedly overlapped. It has been customary to regard this overlapping as if bronze-using man had continued for a period to employ the same substances in making useful articles as did his Neolithic predecessors ; that time was required before the more costly bronze, imported from foreign sources, replaced the native materials, and that consequently both groups of objects became associated in the same grave.

Additional light is thrown on the mixture of objects representing different stages of culture in the same interment by a collection of goods from the grave of an aboriginal Australian, buried about fifty years ago, recently brought under my notice by Dr. R. Broom. Along with the skeleton were found a clay pipe, an iron spoon, the remains of a rusted pannikin, the handle of a pocket-knife, and a large piece of flint. The handle of the knife, with its steel back, had doubtless been used along with the flint for the purpose of obtaining fire, as in Neolithic times a similar office was discharged by flint and a nodule of pyrites. These accompaniments of the Australian interments show that men in a lower grade of culture and intellectual power utilise, as opportunity offers, objects representing a much higher stage of civilisation. It is possible, therefore, that some of the mixed interments ascribed to the Bronze Age may be the graves of Neolithic men who, in conjunction with articles of their own manufacture, had employed the material introduced by a bronze-using race, with whom they had been brought in contact, and whose usages they had more or less imitated.

That the inhabitants of prehistoric Scotland were not a homogeneous people, but exhibited different types in their physical configuration, so as to justify the conclusion that they were not all of the same race, has long been accepted by archæologists. The first observer who made a definite statement, based on anatomical data, was the late Sir Daniel Wilson, in his well-known " Prehistoric Annals of Scotland." Whilst admitting that the material at his disposal was scanty, he thought that he was justified in stating that the primitive race in Scotland possessed an elongated dolichocephalic head, which he termed boat-shaped, or kumbecephalic. This race,

he said, was succeeded by a people with shorter and wider skulls, which possessed brachycephalic proportions. Further, he considered that both these races preceded the intrusion of the Celtæ into Scotland. But the evidence is by no means satisfactory that the interments from which Wilson obtained the long kumbecephalic skulls were of an older date than those which yielded the brachycephalic specimens. So far, therefore, as rests upon these data, one cannot consider it as proved that a long-headed race preceded a broad-headed race in Scotland, and that both were antecedent to the Celtæ.

Evidence from other quarters must be looked for, especially from the extensive researches of Thurnam, Greenwell, Rolleston, and other archæologists into prehistoric interments in England; and by the study of the material which has accumulated in Scotland since the publication of Sir Daniel Wilson's "Prehistoric Annals."

The remains of prehistoric man in England subsequent to the Palæolithic Age have for the most part been found in mounds and tumuli, some of which were very elongated in form, others more rounded, so that they have been divided into the two groups of "long" and "round" barrows. There is a consensus of opinion that the long barrows were constructed by a race which inhabited England prior to the construction of the round barrows. The long barrows are indeed the most ancient sepulchral monuments in South Britain; obviously they were erected before the use of bronze or other metal became known to the people. They belonged, therefore, to the Neolithic Age, as is testified by the implements and weapons found in them being formed of stone, flint, bone, and horn, and by the absence of metals. They are not widely distributed in England, but are found especially in a few counties in the north, as Yorkshire and Westmoreland, and in the western counties in the south. The builders of these barrows in their interments practised both inhumation and cremation, but the burnt bones were never found in urns.

The study of the human remains obtained from the English long barrows by Drs. Thurnam and Rolleston proves that the crania were distinctly dolichocephalic, and that the

height was greater than the breadth. Those measured by Dr. Thurnam gave a mean length-breadth index 71·4, whilst Dr. Rolleston's series were 72·6.

The round barrows were constructed by a bronze-using people. The crania obtained in them were, as a rule, brachycephalic. Of twenty-five skulls measured by Dr. Thurnam seventeen had the length-breadth index 80 and upwards, and in six of these the index was 85 and upwards. Only four were dolichocephalic, whilst in three the index ranged from 77 to 79. In the brachycephalic skulls the height was less than the breadth.

As similar physical conditions prevailed both in England and Scotland during the Polished Stone and Bronze periods, there is a strong presumption that the two races had, in succession to each other, migrated from South to North Britain. Unfortunately very few skulls have been preserved which can with certainty be ascribed to Neolithic man in Scotland, but those that have been examined from Papa Westray, the cairn of Get, and Oban, are dolichocephalic, and doubtless of the same race as the builders of the English long barrows.

Seventeen skulls from interments belonging to the Bronze period have been examined by the author. The mean length-breadth index of twelve was 81·4, and the highest index was 88·6. In each skull the height was less than the breadth. In the other five specimens the mean index was 74; the majority, therefore, were brachycephalic. In only one specimen was the jaw prognathic; the nose was almost always long and narrow; the upper border of the orbit was, as a rule, thickened, and the height of the orbit was materially less than the width. The capacity of the cranium in three men ranged from 1380 to 1555 cc.; the mean being 1462 cc. In stature the Bronze men were somewhat taller than Neolithic men. The thigh bones of the Bronze Age skeletons gave a mean platymeric index 75·1, materially below the average of 81·8 obtained by Dr. Hepburn from measurements of the femora of modern Scots.[1] The tibiæ of the same skeletons gave a mean platyknemic index 68·3; intermediate, therefore, between their

[1] "Journal of Anatomy and Physiology," October 1896.

Neolithic predecessors and the present inhabitants of Britain. Many of the tibiæ also possessed a retroverted direction of the head of the bone ; but the plane of the condylar articular surfaces was not thereby affected, so that the backward direction of the head exercised no adverse influence on the assumption of the erect attitude.

Whilst in England the Bronze Age round barrows are numerous and the burials in short cists are comparatively rare, in Scotland the opposite prevails. Whilst part of Dr. Thurnam's aphorism, viz. "long barrows, long skulls," applies to both countries ; the remaining part, "short barrows, short skulls," should be modified in Scotland to "short cists, short or round skulls."

The presence of dolichocephalic skulls in the interments of the Bronze Age shows that the Neolithic people had commingled with the brachycephalic race. Similarly the Bronze men, though subject to successive invasions by Romans, Angles, and Scandinavians, have persisted as a constituent element of the people of Great Britain. The author has found a strong brachycephalic admixture in the crania of modern Scots—in Fife, the Lothians, Peebles, and as far north as Shetland. In 116 specimens measured, 29 (*i.e.* one-quarter) had a length-breadth index 80 and upwards, and in five of these the index was more than 85.

The question has been much discussed whether the people of the Polished Stone Age were descended from the men of the Ruder Stone Age, or were separated from them by a distinct interval of time. The latter view has been supported by Professor Boyd Dawkins, who contends that there is a great zoological break between the fauna of the Palæolithic-Pleistocene period and that of the Neolithic Age, and that the two periods are separated from each other by a revolution in climate geography, and animal life.[1]

Undoubtedly many large characteristic mammals of the Palæolithic fauna had entirely disappeared from Britain and Western Europe, but some nine or ten species, as the otter, wolf, wild cat, wild boar, stag, roe, urus, and horse, were continued into the Neolithic period ; at which time the dog,

[1] "Cave Hunting" and in "Journal of Anthropological Institute," vol. xxiii., February 1894.

small ox, pig, goat, and perhaps the sheep, as is shown by their osseous remains, were also naturalised in Britain. The continuity of our island with the Continent by intermediate land, which existed during Palæolithic times, also became severed, and a genial temperate climate replaced more or less arctic conditions.

Man, however, possesses a power of accommodation, and of adapting himself to changes in his environment, such as is not possessed by a mere animal. The locus of an animal is regulated by the climate and the nature of the food, so that a change of climate, which would destroy the special food on which an animal lives, would lead to the extinction of the animal in that locality. Man, on the other hand, is omnivorous, and can sustain himself alike on the flesh of seals, whales, and bears in the Arctic circle, and on the fruits which ripen under a tropical sun. Man can produce fire to cook his food and to protect himself from cold, and can also manufacture clothing when necessary. Palæolithic man has left evidence that he had the capability to improve, for the cave men were undoubtedly in advance of the men who made the flint implements found in the river drifts. The capacity of the few crania of Palæolithic man which have been preserved is quite equal to, and in some cases superior to, that of modern savages. So far as regards the implements which he manufactured and employed, Neolithic man showed no material advance over the Palæolithic cave-dweller.

The association of the bones of domestic mammals, which were not present in Palæolithic strata, along with the remains of Neolithic man, proves that additional species had been introduced into Western Europe at a particular period, probably by another race which had migrated northward and westward; but it by no means follows that Palæolithic man had of necessity disappeared prior to this migration, and that when Neolithic man reached Western Europe he found it, as regards his own species, a desolate solitude. How then did Neolithic man with his associated animals find his way into Britain?

Was it whilst the land remained which connected Britain with the Continent in interglacial times, and along which Palæolithic man had travelled, or was it at some subsequent period, after the formation of intermediate arms

of the sea? If the latter, then the further question arises, How was the transit effected? Neolithic man, so far as is known, had no other means of conveyance by water than was afforded by a canoe dug out of the stem of a tree. Although such rude boats might in calm weather serve as a means of transporting a few individuals across a river or narrow strait from one shore to the other, they can scarcely be regarded as fitted for an extensive migration of people; still less as a means of conveying their pigs, dogs, goats, and oxen. Hence one is led to the hypothesis that, after the sea had submerged the intermediate land of interglacial times, there had been a subsequent elevation, so that Britain again became a part of the continent of Europe. If one may use the expression, a "Neolithic land bridge" was produced, continental relations and climate were for a time re-established, and a free immigration of Neolithic man with his domestic animals became possible. This may have been at the period when an abundant forest growth in Scotland succeeded the elevation of what is now called the 100-foot terrace. There is no evidence of the presence of Neolithic man in Scotland until about that period. Before this island with its surrounding and protecting "silver streak" settled down to the present distribution of land and water, there are ample data, as is shown by the three sea beaches at different levels so distinctly seen on the coast of Scotland, that frequent oscillations changed the relative positions of land and sea to each other.

From the consideration of what may be called the biological data, the conclusion seems not to be justified, that because climatic changes had led to a disappearance of certain characteristic Palæolithic mammals, but by no means of all, therefore Palæolithic man had vanished along with them. When Neolithic man reached Western Europe, he in all likelihood found his Palæolithic predecessor settled there, and a greater or less degree of fusion took place between them. Hence, as the present inhabitants of Britain may claim the men both of the Neolithic and Bronze Ages as their ancestors, it is possible that as Neolithic man migrated northward into Scotland he may have carried with him a strain of Palæolithic blood.

REPORT ON THE MOVEMENTS AND OCCURRENCE OF BIRDS IN SCOTLAND DURING 1897.

By T. G. Laidlaw,
Member of the British Ornithologists' Union.

Schedules were sent out as usual by Messrs. Harvie-Brown and Eagle Clarke to the Light Stations on the Scottish coasts, and of these twenty-four have been returned duly filled in.

Schedules and notes have also been received from twenty-two other observers in various parts of the country, making a total of forty-six reports examined and tabulated. This represents an increase of twelve over the number received last year.

While it is satisfactory to record an increase in the number of schedules received, it is hoped additional observers may be induced to record and send in reports from *all* the different faunal areas. The need of such in Moray, West Ross, Tweed, and Solway may be specially referred to.

Schedules may always be obtained from Mr. Eagle Clarke, Museum of Science and Art, Edinburgh.

We have to express our hearty thanks to all those who have so kindly sent in reports, or otherwise assisted in these inquiries.

The following list gives the names of observers from whom reports have been received. The localities are arranged under the different faunal areas, proceeding from north to south along the east and west coasts.

Locality.	*Name of Observer.*
Shetland.	
North Unst L.H.	James Ferrier, Lightkeeper.
Various Localities	Robert Godfrey, M.A.
Orkney.	
North Ronaldshay L.H.	John A. Mackay, Lightkeeper.
Pentland Skerries L.H.	Robert A. M'Harrie, Lightkeeper.
Various Localities	Robert Godfrey, M.A.

SUTHERLAND.

Locality.	*Name of Observer.*
Dunnet Head L.H.	Archibald M'Eachern, Lightkeeper.
Cape Wrath L.H.	The Lightkeepers.
Thurso District	Lewis Dunbar.

MORAY.

Strathspey	Lionel W. Hinxman, B.A.

DEE.

Kinnaird Head L.H.	The Lightkeepers.
Rattray Head L.H.	R. Clyne and J. Gilmour, Lightkeepers.
Peterhead	Rev. W. Serle, M.A.

TAY.

Auchinblae, Fordoun	John Milne.
Upper Tay	Bruce Campbell.
Tayfield, Newport	William Berry, B.A., LL.B.

FORTH.

Isle of May L.H.	T. E. Arthur, Lightkeeper.
Row, Doune	Lt.-Col. Duthie.
Lothians, Dollar, and Aberfoyle	William Evans.
Edinburgh District	Bruce Campbell.
Dalmeny	Charles Campbell.
Various Localities	Robert Godfrey, M.A.

TWEED.

Hallmyre, Peebles	D. G. Laidlaw.
Chirnside	Charles Stuart, M.D.

OUTER HEBRIDES.

Island Ghlais L.H.	James M'Guffie, Lightkeeper.
Monach L.H.	D. S. Stewart, Lightkeeper.
North Bay, Barra.	John MacRury, M.B.

ARGYLL AND INNER HEBRIDES.

Skerryvore L.H.	John Nicol and William Ross, Lightkeepers.
Dhuheartach L.H.	William Davidson, Lightkeeper.
Scarnish, Tiree	P. Anderson.

Locality.	*Name of Observer.*
Clyde.	
Lamlash L.H.	James Edgar, Lightkeeper.
Pladda L.H.	Robert A. M'Harrie, Lightkeeper.
Ailsa Craig L.H.	William A. Tulloch, Lightkeeper.
Various Localities	John Paterson, John Robertson, H. Boyd-Watt, and Robert Wilson.
Solway.	
Mull of Kintyre L.H.	William Quine, Lightkeeper.
Solway Fishery, Dumfries.	J. J. Armistead.

General Remarks.

The winter of 1896-97, as in the preceding year, was mild and open, but was followed by a cold and wet spring; consequently the season was a late one. This did not, however, seem to affect to any great extent the times of arrival of our summer visitants; the average dates recorded showing no wide departure from the normal. Indeed, one or two exceptionally early dates are noted, such as March 27th, Redstart at Skerryvore; and March 22nd, House Martin at Whithorn.

There is little to notice with regard to the spring migration. On Feb. 5th-6th, at Skerryvore, there was a rush of Starlings, Larks, and Thrushes, with a S.E. wind; while from Pladda and Tiree, Wagtails in numbers were passing from April 28th to May 4th. At Tiree a large flock of Whimbrels was noted on May 1st.

The principal autumn movements on the East Coast occurred during the first and last weeks in October. At Dunnet Head, on Oct. 2nd, Larks and Linnets in great numbers were passing all night; and at Rattray Head a great rush of Turdidæ, Larks, and Snow Buntings took place on Oct. 31st with a S.E. light breeze.

On the West Coast, on August 31st, Sept. 1st-8th, rushes of small birds—Wheatears, Wagtails, Pipits, and Warblers—are reported from Dhuheartach, Skerryvore, and Pladda. Other rushes, of Turdidæ chiefly, with Larks and Snow Buntings, occurred on Oct. 23rd, Oct. 31st, Nov. 1st-

5th, with light winds from S.E. Nearly all the stations note these movements.

The Turtle Dove has again been reported in unusual numbers. This bird appears to be extending its range, and may possibly soon be recognised as a regular summer visitant to Northern Britain.

The occurrence of the Frigate Petrel (*Pelagodroma marina*)—the second British example—at Colonsay on Jan. 1st is the most interesting rarity recorded during the year. The list of uncommon species includes the Waxwing (*Ampelis garrulus*) at Musselburgh and Chirnside; Bee-eater (*Merops apiaster*) at Langwell, Caithness, on May 13th; Bittern (*Botaurus stellaris*) at Invergarry, Inverness, on Feb. 2nd; Stone Curlew (*Œdicnemus scolopax*) at Muirhouse on August 12th; Gray Phalarope (*Phalaropus fulicarius*) at Kelton, Solway, on Sept. 19th; and Great Snipe (*Gallinago major*) at Crocketford, Solway, on Oct. 2nd. The probable breeding of the Fulmar Petrel (*Fulmarus glacialis*), as recorded in the "Annals" (1897, p. 254), is also worthy of mention, as the species has not hitherto been known to breed on the mainland of Britain.

Turdus musicus (Song Thrush).

Dee—Rattray Head, April 29. *Outer Hebrides*—Monach, Oct. 24. *Argyll and Isles*—Tiree, Oct. 23. Skerryvore, Feb. 5-6, all night with Starlings and Larks; Oct. 23, great rush with other birds; Oct. 29-Nov. 1, numbers striking. Dhuheartach, Oct. 25; Nov. 5, all night with Redwings. *Clyde*—Ailsa, Jan. 27; Pladda, Feb. 3; Queen's Park, Glasgow, Dec. 18, a few.

Principal movements, Oct. 23-Nov. 5.

Turdus iliacus (Redwing).

Sutherland—Dunnet Head, Feb. 13, at lantern. *Moray*—Badenoch, Oct. 23. *Dee*—Rattray Head, Oct. 31-Nov. 1, great rush with other birds. *Forth*—Bonally, Oct. 4, several; Loganlee, Oct. 4; Isle of May, Nov. 1. *Tweed*—Chirnside, April 4-Nov. 20. *Outer Hebrides*—Barra, Oct. 11, one; Oct. 21, flock. Island Ghlais, Oct. 28-29. *Argyll and Isles*—Tiree, Oct. 21, arrived; Oct. 31, numerous. Skerryvore, Oct. 23, rush of Turdidæ and Starlings; Oct. 28-29, numbers striking; Nov. 5, a rush. Dhuheartach, Oct. 31-Nov. 1, all night; Nov. 3, with Blackbirds, great

numbers killed; Nov. 5, all night. *Clyde*—Ailsa, Jan. 27, Sept. 3, Oct. 18-20; Mearns, Oct. 23, a few.

Earliest observed, Sept. 3, Ailsa Craig. Principal movements, Oct. 23-31, Nov. 5.

Turdus pilaris (Fieldfare).

Dee—Peterhead, Oct. 30. Rattray Head, Oct. 31; Nov. 1, great rush. *Tay*—Auchinblae, Feb. 7, fewer than usual. *Forth*—Balerno, April, 29; Tynehead, Nov. 6; Morton, Nov. 9. *Tweed*—Chirnside, April 4; Nov. 20, rather later than usual. *Outer Hebrides*—Monach, Oct. 1; Barra, Nov. 6, flock. *Argyll and Isles*—Tiree, Oct. 14; Nov. 12, large numbers. Dhuheartach, Nov. 5, all night. Skerryvore, Oct. 23, great rush; Nov. 5, rush. *Clyde*—Pladda, Jan. 2, 11, 28; Feb. 22, killed at lantern. Beith, May 16, a few. Mearns, Oct. 23.

Earliest observed, Oct. 1, Monach. Principal movements, Oct. 23, Nov. 1-5.

Turdus merula (Blackbird).

Sutherland—Cape Wrath, April 4. *Dee*—Peterhead, Oct. 25, Nov. 2, no marked rush of Turdidæ this season. Rattray Head, Feb. 20, at lantern; Oct. 31-Nov. 1, great rush, many striking. Kinnairds Head, Nov. 2, large numbers, with Starlings, at lantern. *Forth*—Isle of May, Oct. 10. *Outer Hebrides*—Monach, Oct. 23, Nov. 7-24. *Argyll and Isles*—Dhuheartach, Oct. 25, on rock; Nov. 3, all night, numbers killed. Skerryvore, Oct. 23, great rush; Nov. 1-5, many striking. *Clyde*—Ailsa, Jan. 27; Sept. 4, most seen. Pladda, Feb. 22.

Turdus torquatus (Ring Ousel).

Forth—Isle of May, Sept. 4; Aberfoyle, Sept. 13. *Outer Hebrides*—Barra, April 8, first record. *Clyde*—Lamlash, April 16; Pladda, Sept. 2. *Solway*—Mull of Kintyre, April 2.

Earliest observed, April 2, Mull of Kintyre.

Pratincola rubicola (Stonechat).

Clyde—Ailsa, Feb. 28, two seen.

Pratincola rubetra (Whinchat).

Forth—Dalmeny, April 22; Dollar, May 4. *Tweed*—Chirnside, May 10, Aug. 30. *Outer Hebrides*—Barra, May 17. *Argyll and Isles*—Skerryvore, Aug. 22. *Clyde*—Carluke, April 29; Pollokshaws, Sept. 3.

Earliest, April 22, Dalmeny; latest, Sept. 3, Pollokshaws.

Saxicola œnanthe (Wheatear).

Orkney—North Ronaldshay, Oct. 11, good many. *Sutherland*—Cape Wrath, April 4-5, a few. *Moray*—Badenoch, April 5. *Dee*—Peterhead, April 4; Sept. 27, scarce this season. *Tay*—Auchinblae, Sept. 27, left. *Forth*—Aberfoyle, March 27; Torduff, April 1, a pair; Lammermuirs, April 10. *Tweed*—Chirnside, April 5, Sept. 5; Hallmyre, April 6. *Outer Hebrides*—Barra, March 31; Monach, Sept. 5. *Argyll and Isles*—Tiree, March 29, small flock. Dhuheartach, April 27, flying about lantern, with Goldcrests: August 22, four on rock; Sept. 1, all night in hundreds, with Larks and Wagtails. Skerryvore, March 29, one at lantern; Aug. 22, 31-Sept. 1, rush, with other birds, many killed, S. strong breeze; Sept. 8, in rush with other birds; Sept. 29-30, flocks at lantern with other small birds; Oct. 23, along with rush of Turdidæ. *Clyde*—Ailsa, March 29; Beith, April 3; Thornliebank, April 4; Lamlash L.H., May 21, first arrivals; Tighvein, Arran, Sept. 27. *Solway*—Mull of Kintyre, April 4.

Earliest, March 27, Aberfoyle; latest, Oct. 23, Skerryvore. Principal movements, Sept. 1-8.

Ruticilla phœnicurus (Redstart).

Moray—Badenoch, April 17. *Tay*—Ballinluig, May 2. *Forth*—Templehouse, April 1; Dalmeny, May 2; Dreghorn, April 27; Dollar, May 4; Isle of May, Sept. 4. *Tweed*—Chirnside, May 1, Aug. 20; Hallmyre, May 4. *Argyll and Isles*—Skerryvore, March 27, at lantern; Oct. 1, a number. Dhuheartach, Nov. 2. *Clyde*—Carluke, April 26; Ailsa, May 11; Queen's Park, Glasgow, Sept. 6.

Earliest, March 27, Skerryvore; latest, Nov. 2, Dhuheartach.

Erithacus rubecula (Robin).

Orkney—North Ronaldshay, Oct. 4, a few. *Dee*—Peterhead, no definite rush. *Argyll and Isles*—Dhuheartach, Oct. 25; Tiree Oct. 26. *Clyde*—Lamlash L.H., Aug. 27; Ailsa, Sept. 3.

Sylvia cinerea (Whitethroat).

Orkney—North Ronaldshay, July 7, a few. *Dee*—Peterhead, May 26. *Tay*—Tayfield, May 2. *Forth*—Dollar, April 30; Dalmeny, May 1; Kirknewton, May 11. *Tweed*—Hallmyre, May 1; Chirnside, May 5, Sept. 10. *Outer Hebrides*—Barra, May 17. *Clyde*—Thornliebank, April 29; Ailsa, two pairs bred on Craig.

Earliest, April 29, Thornliebank; latest, Sept. 10, Chirnside.

Sylvia atricapilla (Blackcap).

Forth—Dalmeny, May 19; Aberfoyle, Sept. 12-13. *Tweed*—Chirnside, May 1, Sept. 10. *Clyde*—Carluke, May 14.

Earliest, May 1, Chirnside; latest, Sept. 13, Aberfoyle.

Sylvia hortensis (Garden Warbler).

Tay—Tayfield, May 16 (first time noticed). *Forth*—Isle of May, Sept. 9, a male picked up (quite fresh). *Argyll and Isles*—Skerryvore, Sept. 8, in rush with other birds (wings sent); Oct. 20, a few at lantern. *Clyde*—Carluke, May 6; Busby, June 16, nest taken in Killoch Glen.

Earliest, May 6, Carluke; latest, Oct. 20, Skerryvore.

Regulus cristatus (Gold-crested Wren).

Orkney—North Ronaldshay, Nov. 4. *Dee*—Peterhead, Oct 24, a few migrants. *Outer Hebrides*—Barra, April 8, one (first record); April 12 and 24, one each time; Mingley Island, April 19, one. *Argyll and Isles*—Dhuheartach, April 27, flying about lantern, with Wheatears. *Clyde*—Pladda, March 27, April 5-27, Sept. 14, Oct. 13-14; Ailsa, April 3-7; Lamlash L.H., Oct. 21.

Phylloscopus rufus (Chiffchaff).

Forth—Aberfoyle, April 7; Kirknewton, May 14. *Tweed*—Chirnside, May 1, Oct. 20. *Clyde*—Kildonan, Arran, March 30.

Earliest, March 30, Kildonan.

Phylloscopus trochilus (Willow Wren).

Moray—Badenoch, April 28. *Dee*—Peterhead, May 1, few have arrived. *Tay*—Auchinblae, April 29, large numbers; Ballinluig, May 1; Newport, May 2. *Forth*—Dollar, April 20, one; April 23-24, common. Dalmeny, April 21; Balerno, April 26; Aberfoyle, Sept. 13. *Tweed*—Hallmyre, April 24, one; April 28, common. Chirnside, May 10, Aug. 2, very plentiful this year. *Outer Hebrides*—Barra, April 12. *Argyll and Isles*—Tiree, May 15; Skerryvore, April 27, Aug. 31, Sept. 1, rush, many killed. *Clyde*—Ailsa, April 7, 10, 11; Daldowie and Carluke, April 15; Lamlash L.H., April 28, one at lantern; Queen's Park, Glasgow, Sept. 20.

Earliest, April 7, Ailsa; latest, Queen's Park, Glasgow, Sept. 20. Principal movements, Aug. 31, Sept. 1.

PHYLLOSCOPUS SIBILATRIX (Wood Wren).

Tay—Ballinluig, May 2. *Forth*—Dollar, April 30; Tillicoultry, May 3; Dalmeny, May 3. *Clyde*—Blantyre Priory, May 1.

Earliest, April 30, Dollar.

ACROCEPHALUS PHRAGMITIS (Sedge Warbler).

Orkney—Stennis Mill Dam, nesting, May 26. *Moray*—Badenoch, May, 29. *Tweed*—Hallmyre, May 6. *Clyde*—Thornliebank, May 2; Pladda, Aug. 31, one killed.

Earliest, May 2, Thornliebank.

LOCUSTELLA NÆVIA (Grasshopper Warbler).

Clyde—Beith, April 30.

CINCLUS AQUATICUS (Dipper).

Outer Hebrides—Barra, July 26, one.

TROGLODYTES PARVULUS (Wren).

Argyll and Isles—Tiree, Oct. 29, several.

MOTACILLINÆ (Wagtails).

Dee—Peterhead, May 22, *M. raii* (Yellow Wagtail), a pair; Sept. 11, *M. lugubris* (Pied Wagtail), marked rush. *Tay*—Auchinblae, May 10-11, *M. lugubris*, about 100. *Forth*—Doune, Sept. 26, many in the fields. Tantallon, Aug. 22, *M. raii*, three. Isle of May, Sept. 9, *M. alba* (White Wagtail), a very fine adult ♂. *Outer Hebrides*—Barra, May 3, one; May 10, many *M. alba;* Aug. 17, returning south. Island Ghlais L.H., Aug. 19, "Wagtails." *Argyll and Isles*—Tiree, March 18, *M. lugubris;* April 28-30, May 1, 4-18, *M. alba*, "more plentiful than I ever remember seeing them"; Aug. 26, *M. raii*, one; Sept. 2-3, *M. alba*, passing south. Dhuheartach, May 17, "Wagtails"; Aug. 22-24, Sept. 1, in rush with other birds. Skerryvore, Aug. 24, *M. raii* on rock; Aug. 31-Sept. 1, a rush all night along with other birds, "Wagtails"; Sept. 8, *M. alba* (wings sent), a rush of birds. *Clyde*—Ailsa, March 4, 6, 7, "common Wagtail"; Aug. 21, *M. raii*, one seen; Aug. 22, *M. melanope* (Gray Wagtail), four seen; Sept. 3, "Wagtails," "most I have ever seen on the Craig." Whiting Bay, March 17, *M. alba* Beith, April 22, *M. raii*. Erskine, Sept. 18, *M. raii*. Pladda L.H., April 28, all day, "Wagtails"; Sept. 15, 17, "Wagtails." Lamlash L.H., May 13, *M. lugubris*, a pair.

Principal movements, April 28 to May 4, Aug. 31, Sept. 1-8.

Anthus trivialis (Tree Pipit).

Tay—Ballinluig, May 2. *Forth*—Castle Campbell, Dollar, April 22; Dollarbeg, April 24; Forest Mill, Clackmannan, April 28, several. Kirknewton, May 7. *Tweed*—Hallmyre, May 1. *Clyde*—Cathcart, April 23; Loch-Lomondside, May 3, large numbers. "Sp. not named in Lumsden's 'Nat. Hist. of Loch Lomond,' 1895."

Earliest, Castle Campbell, April 22.

Anthus pratensis (Meadow Pipit).

Dee—Peterhead, April 17, marked migratory movement during last week. *Argyll and Isles*—Dhuheartach, Aug. 23. Skerryvore, April 29, one killed at lantern. Aug. 31-Sept. 1, all night in rush with Wheatears, Wagtails, and Willow Wrens. Sept. 8, a rush of small birds; Oct. 1-2. *Clyde*—Ailsa, March 6-9. Thornliebank, March 14, about thirty. Pladda L.H., March 21-26, April 6-8, Oct. 4, 5, 6, 21.

Principal movements, Aug. 31, Sept. 1-8.

Ampelis garrulus (Waxwing).

Forth—Musselburgh (near), one caught early in Nov. *Tweed*—Chirnside, "more plentiful than usual in Berwickshire."

Muscicapa grisola (Spotted Flycatcher).

Dee—Peterhead, May 29, first seen. *Tay*—Auchinblae, May 18, plentiful. Tayfield, May 24. *Forth*—Dalmeny, May 22, Aug. 15. *Tweed*—Hallmyre, May 25, a pair. *Clyde*—Kildonan, April 26; Queen's Park, Glasgow, Sept. 20.

Earliest, April 26, Kildonan; latest, Sept. 20, Queen's Park, Glasgow.

Hirundo rustica (Swallow).

Orkney—North Ronaldshay, Aug. 24. *Sutherland*—Cape Wrath, May 8-30. *Moray*—Badenoch, May 20. *Dee*—Peterhead, May 5; Sept. 26, left in a body. Rattray Head, May 9. *Tay*—Tayfield, April 23, Oct. 14; Auchinblae, April 24, Sept. 2; Ballinluig, May 1. *Forth*—Dalmeny, April 18, Nov. 17; Aberfoyle, April 20; Dollar, April 26; Currie, Oct. 4, flock of thirty or forty. *Tweed*—Chirnside, April 14, Oct. 23; Hallmyre, April 23. *Outer Hebrides*—Barra, May 15. *Argyll and Isles*—Dhuheartach, May 16-27; Skerryvore, May 16, 17, 28, June 1. *Clyde*—Lamlash, April 10; Pladda L.H., April 24, May 4-21, Aug. 24; Ailsa, May 8, about twenty; Queen's Park, Glasgow, Oct. 11. *Solway*—Mull of Kintyre, April 7.

Earliest, April 10, Lamlash; latest, Dalmeny, Nov. 17.

Chelidon urbica (House Martin).

Shetland—Lerwick, June 4, single bird. *Tay*—Auchinblae, May 12, Sept. 27. *Forth*—Tynehead, May 1; Dollar, May 3; Craighouse, Edinburgh, Oct. 16. *Tweed*—Chirnside, May, 4, Sept. 10; Hallmyre, May 9. *Clyde*—Thornliebank, May 2. Lamlash L.H. May 19, all day, N.E. light breeze; Sept. 12, flocks all day. Mount Florida, Sept. 25. *Solway*—Whithorn (near), March 22, one flew into a house (see "Annals," p. 193).

Earliest, March 22, Whithorn; latest, Oct. 16, Craighouse, Edinburgh.

Cotile riparia (Sand Martin).

Moray—Badenoch, April 27; June 5, many hatched. *Tay*—Ballinluig, May 1. *Forth*—Dollar, April 24, several. *Tweed*—Chirnside, April 12, Aug. 10; Hallmyre, May 6. *Argyll and Isles*—Skerryvore, Aug. 2-3, a few, midnight, at lantern. *Clyde*—Cambuslang, April 11.

Earliest, April 11, Cambuslang.

Fringillinæ (Finches and Linnets).

Orkney—Pentland Skerries, Dec. 29, Greenfinch, one killed. *Dee*—Kinnairds Head, Linnets, Sept. 28-29, in large flocks at lantern; Oct. 2, in great numbers. Rattray Head, Linnets, Oct. 31, at lantern. Peterhead, Greenfinch, Oct. 24-25; Nov. 6, large flocks. *Forth*—Dreghorn, Goldfinch, April 18 (see "Annals," p. 193); Crichton, Lesser Redpoll, Oct. 2, small flock; Isle of May, Dec. 8, Greenfinch (leg and wing sent). *Tweed*—Chirnside, April 10, Brambling; Oct. 20, flocks feeding on beech mast; Oct. 19, Greenfinch and Chaffinch in immense flocks preparing for migration. *Outer Hebrides*—Barra, Brambling, Oct. 21; Greenfinch, Oct. 22; Chaffinch, Oct. 19-24; Siskin, Oct. 29, "first record," Nov. 1, "about a dozen." Monach, Greenfinch, Oct. 23, flock; Chaffinch, Oct. 24, at lantern. *Argyll and Isles*—Tiree, Chaffinch, Jan. 2, Oct. 9. Dhuheartach, Chaffinch, April 20; Oct. 21, 24, 26, all day going S.; Nov. 2, all night at lantern. Skerryvore, Chaffinch, Oct. 21-23, all night flying about light, but not striking; Nov. 1-5, numbers all night, S.E. fresh breeze; Greenfinch, Oct. 25-31, flocks flying past going S.E. Tiree, Greenfinch, Nov. 15, flocks. *Clyde*—Ailsa, Chaffinch, Jan. 2, 27, April 17, Oct. 19; Greenfinch, Jan. 4, 27; House Sparrow, Jan. 7, one seen; Linnet, Jan. 25, four, Feb. 24, seventeen, Oct. 20, twelve; Twite, Jan. 27, "considerable movement on this date," N. strong breeze; Redpoll, April 29, two seen.

Principal movements, Oct. 21-26, Nov. 1-6.

Loxia curvirostra (Crossbill).

Tay—Auchinblae, Feb. 7, thirty to forty; Nov. 8. *Argyll and Isles*—Dhuheartach, May 27, young bird, skin sent.

Emberizinæ (Buntings).

Dee—Peterhead, Reed Bunting, April 17, marked migratory movement. *Argyll and Isles*—Dhuheartach, Common Bunting, Oct. 27, two on rock; Nov. 19, a few birds striking (wing sent), S.W. strong breeze. *Clyde*—Ailsa, Common Bunting, Feb. 27, Oct. 20; Yellow Bunting, Feb. 21-26, Oct. 21.

Plectrophenax nivalis (Snow Bunting).

Orkney—North Ronaldshay, Sept. 14, "swarms." Pentland Skerries, Nov. 22; Dec. 2-16, flocks. *Sutherland*—Dunnet Head L.H., Jan. 6, 10, 24, March 29, Nov. 5; Cape Wrath, March 16-17, a very large flock; March 24, three struck lantern. *Moray*—Badenoch, Nov. 3, first. *Dee*—Rattray Head, Oct. 31; Nov. 1, in rush of Turdidæ, Starlings, and Larks, S.E. haze. Peterhead, Dec. 31, flock. *Tay*—Auchinblae, Jan. 30. *Forth*—Isle of May, Nov. 1 (leg and wing sent); Swanston Hill, Nov. 13, flock; Leith, Feb. 24. *Outer Hebrides*—Monach, Oct. 1, two at lantern; Island Ghlais, Oct. 2, one killed; Barra, Nov. 11, flock. *Argyll and Isles*—Dhuheartach, Oct. 9, several at lantern, S.W., strong, showers. Skerryvore, Oct. 10; Nov. 1, numbers of birds striking, S.E., fresh; Nov. 5, a rush all night, S., light. Tiree, Oct. 11-28, flocks. *Clyde*—Ailsa, Jan. 25, great many; March 12; April 4, last seen; Oct. 13, first; Oct. 18. Queen's Park, March 10. *Solway*—Mull of Kintyre, Oct. 21.

Principal movements, Oct. 31, Nov. 1-5.

Sturnus vulgaris (Starling).

Orkney—North Ronaldshay, Nov. 5, "swarms," N.W., light, hazy. *Sutherland*—Cape Wrath, March 24, April 4. *Dee*—Rattray Head, Oct. 31, Nov. 1, in rush with other birds, S.E., hazy; Kinnairds Head, Nov. 1-2, large numbers at lantern. *Argyll and Isles*—Skerryvore, Feb. 6-7, all night with Larks and Thrushes, S.E., strong; Oct. 23, in rush with Turdidæ. Dhuheartach, March 2, at lantern; Oct. 15-27, all day, S.E., fresh; Nov. 21, at lantern. *Clyde*—Pladda L.H., Feb. 3, 7, 22, 25, at lantern; Lamlash L.H., March 15, struck lantern; Ailsa, Sept. 29, Oct. 18.

Garrulus glandarius (Jay).

Tweed—Chirnside, Oct. 23, two shot, another seen. "Has not been seen in Berwickshire for fifty years."

Corvidæ (Crows and Rooks).

Orkney—Pentland Skerries, Dec. 16, Hooded Crow, two remaining on island. *Tay*—Auchinblae, Nov. 8, a large augmentation to summer stock (Carrion Crow). *Forth*—Aberlady, Hooded Crow, Oct. 8, five; Oct. 16, twenty. *Argyll and Isles*—Tiree, Rook, Oct. 14, large flock; Nov. 16, large flock. Dhuheartach, Jackdaw, Oct. 12, on rock; Rook, Oct. 15-16, Nov. 23. Skerryvore, "Crows," Nov. 14, fourteen flying S.

Alauda arvensis (Skylark).

Dee—Peterhead, came in gradually and numerously during latter half of September, no definite rush; Kinnairds Head L.H., Oct. 2, along with Linnets, in great numbers; Rattray Head L.H., Oct. 31, Nov. 1, rush with Redwings and other birds, S.E., hazy. *Forth*—Isle of May, Oct. 19. *Tweed*—Chirnside, Oct. 20, in large flocks. *Outer Hebrides*—Monach, Oct. 1, eight at lantern. *Argyll and Isles*—Skerryvore, Jan. 30, at lantern; Feb. 5-6, all night with other birds; March 9, Oct. 21, Nov. 6, numbers about light; Nov. 26, Dec. 21-22. Dhuheartach, Aug. 23, at lantern; Sept. 1, all night in hundreds with Wagtails and Wheatears; Oct. 22, all night. *Clyde*—Ailsa, Jan. 25; Feb. 6, at lantern; March 20. Pladda, Jan. 30, one killed at light; Feb. 3, 6, 26, several at lantern. Lamlash L.H., March 14, three at lantern.

Principal movements, Feb. 5-6, Oct. 2-31, Nov. 1-6.

Cypselus apus (Swift).

Moray—Badenoch, May 20. *Dee*—Peterhead, May 20, Aug. 6; Rattray Head L.H., June 25. *Tay*—Ballinluig, May 2, Aug. 24. Auchinblae, May 13, four or five pairs arrived; Aug. 1, twenty to thirty left. *Forth*—Edinburgh, May 4; Tantallon, Aug. 29, five flying S.; Portobello, Sept. 2. *Tweed*—Chirnside, May 5; Aug. 24, later than usual. Hallmyre, May 27, three passing over. *Outer Hebrides*—Barra, June 28, two. *Clyde*—Bothwell, May 1; Cathcart, Sept. 2; Pladda L.H., May 31, June 4. *Solway*—Mull of Kintyre, June 10.

Earliest, May 1, Bothwell; latest, Sept. 2, Portobello, Bothwell.

Caprimulgus europæus (Nightjar).

Sutherland—Canisbay, Sept. 25. *Tay*—Auchinblae, Aug. 2. *Forth*—Aberfoyle, May 16. *Outer Hebrides*—Island Ghlais, Aug. 14. *Clyde*—Lamlash, April 27.

Dendrocopus major (Great Spotted Woodpecker).

Tweed—Chirnside, July 25, feeding young in Duns Castle woods. Also seen lately in gardens at Castle Terrace, Berwick.

Merops apiaster (Bee-eater).

Sutherland and Caithness, May 13, adult ♂ found in garden at Langwell, ♀ afterwards seen attacking bees (see "Annals," 1897, p. 250).

Cuculus canorus (Cuckoo).

Shetland—Delting Hills, June 11 (see "Annals," 1897, pp. 250-251). *Sutherland*—Cape Wrath, May 30. *Moray*—Badenoch, April 26. *Tay*—Auchinblae, April 24. *Forth*—Aberfoyle, April 23; Dollar, April 27; Dalmeny, April 26; Listonshiels, April 28. *Tweed*—Hallmyre, April 24; Chirnside, April 29. *Outer Hebrides*—Barra, April 26. *Argyll and Isles*—Tiree, May 23, two. *Clyde*—April 24-26, all over "Clyde"; Luss, Aug. 30; Lamlash L.H., June 22, last heard; Pladda L.H., July 27, leg sent (young). *Solway*—Mull of Kintyre, May 10.

Earliest, April 23, Aberfoyle.

Asio accipitrinus (Short-eared Owl).

Orkney—Pentland Skerries, Dec. 14, one shot. *Sutherland and Caithness*—Dorrey, Dec. 24, two, ♂ and ♀, shot. *Argyll and Isles*—Skerryvore, Nov. 1, one on rock; Tiree, Nov. 11. *Clyde*—Lamlash L.H., Dec. 19, flying round light, went away S.

Falconidæ (Falcons and Hawks).

Shetland—Honey Buzzard shot at Balta Sound on July 29 or 30 (see "Annals," 1897, p. 225). *Sutherland and Caithness*—Hen Harrier, Feb. 3; young ♂ killed at Durran. *Moray*—Honey Buzzard, Sept. 2, a pair shot on the Findhorn (see "Annals," 1897, p. 252). *Dee*—Red-footed Falcon, May 7, killed near Aberdeen (see "Annals," 1897, p. 251); Peterhead, Osprey captured, May 17 (see "Annals," 1897, p. 192).

Botaurus stellaris (Bittern).

Moray—Invergarry, Inverness, Feb. 2 (see "Annals," 1897, p. 192).

Anserinæ (Geese).

Sutherland and Caithness—Tister Swamp, *A. albifrons* (White-fronted Goose), Sept. 30, one killed (five seen). *Tay*—Tayfield, *A. brachyrhynchus* (Pink-footed Goose), April 25, last seen; Sept. 26, flying over. *Forth*—Dollar, *A. brachyrhynchus* (Pink-footed Goose), April 19-21, flocks going N.E.; Gullane, April 21; Aberlady, Oct. 9, seven; Mortonhall, Oct. 11, a string passed over.

Tweed—*A. brachyrhynchus* (Pink-footed Goose), Nov. 20, now about Coldingham Moor. *Argyll and Isles*—Tiree, *A. cinereus* (Graylag Goose), Feb. 25, Oct. 8, passing south; *A. albifrons* (White-fronted Goose), May 8, still here, very late; May 11, left; Oct. 15, about 200 arrived; *Bernicla leucopsis* (Bernacle Goose), March 1; Dhuheartach, "Geese," Oct. 10, Nov. 20, travelling S. *Clyde*—Lamlash L.H., "Gray Geese," Nov. 25, flying S.W.; Fairlie Roads, *B. brenta* (Brent Goose), Feb. 20, "hundreds." *Solway*—Mull of Kintyre, "Wild Geese," Sept. 10, going S.

Cygninæ (Swans).

Forth—Barnbougle, "Swans," Feb. 10, two old and four young birds in Forth. *Argyll and Isles*—Dhuheartach, "Swans," Jan. 17, ten going N., six flying S.E.; Tiree, *C. musicus* (Whooper), Oct. 21, seven on Loch Rioghan; *C. bewicki* (Bewick's Swan), Nov. 26.

Anatidæ (Ducks).

Shetland—Walls, *Mareca penelope* (Wigeon), nest found in June. *Orkney*—Tankerness, *M. penelope* (Wigeon), May 31, two ♂s, ♀s probably sitting; *Fuligula cristata* (Tufted Duck), May 26, pairs on Stenness, Skaill, and Clumly Lochs; *F. marila* (Scaup), Tankerness, May 31, two pairs; *Clangula glaucion* (Golden-eye), May 26, one on Skaill, five on Clumly. *Moray*—Badenoch, *M. penelope*, May 24, pair on Loch Tush; Kingussie, *C. glaucion*, Nov. 15, several on Spey. *Dee*—Rattray Head, *Harelda glacialis* (Long-tailed Duck), April 29, large flock; Oct. 13, flock, first this season. *Tay*—Johnshaven, *Dafila acuta* (Pintail), Nov. 8, a ♂ caught; Auchinblae, *M. penelope*, May 16, nest with eight eggs at Glensauch Loch; Tayfield, *C. glaucion*, Oct. 16, young bird shot. *Forth*—Loch Leven, *D. acuta*, May 1, a pair; Dalmeny, *M. penelope*, Sept. 30, in Longgreen Bay; Lochend, *F. ferina* (Pochard), March 22; Alloa, *C. glaucion*, April 27, seven on Gartmorn Dam. *Tweed*—*F. ferina*, Jan. 5, shot at Foulden West Mill Dam. *Outer Hebrides*—Barra, *M. penelope*, Sept. 4; *F. marila*, Nov. 1; *C. glaucion*, Oct. 11. *Argyll and Isles*—Tiree, *Anas strepera* (Gadwall), Nov. 14; *C. penelope*, April 26, left; Oct. 27; *F. marila*, Nov. 3, Dec. 20, large flock; *H. glacialis*, Nov. 6, numerous; *Œdemia nigra* (Scoter), a pair nested (see "Annals," 1897, p. 252); *Mergus albellus* (Smew), Sept. 7, several in Gott Bay. *Clyde*—Balgray Dam, *Spatula clypeata* (Shoveller), Oct. 14, immature ♂ shot; *M. penelope*, April 24, fourteen, Woodend Loch, Gartcosh; *F. cristata*, June, 5, four, Kilbirnie; June 30, four, Woodend Loch; *F. ferina*, June 30, four, Woodend Loch. *Solway*, "Scoters," Aug. 18, many seen.

Columba palumbus (Ring Dove).

Argyll and Isles—Skerryvore, Dec. 21, two at lantern (3 A.M.), one killed, rarely seen. *Clyde*—Ailsa, March 6, one seen.

Columba œnas (Stock Dove).

Tweed—Chirnside, Oct. 5, several companies seen, increasing in numbers.

Turtur communis (Turtle Dove).

Sutherland—Ghett Lodge, Sept. 29. *Tweed*—Chirnside, Oct. 10, several in fields. *Outer Hebrides*—Barra, May 22, pair, second occurrence. *Argyll*—Drimnin, Sept. 7, one shot (see "Annals," 1897, p. 254).

Crex pratensis (Land Rail).

Shetland—Bressay, June 4; Entherwick, June 5. *Sutherland*—Cape Wrath, May 29. *Dee*—Peterhead, May 26. *Forth*—Morningside, April 25; Comiston, May 7; Aberlady, May 11; Dalmeny, May 12. *Tweed*—Hallmyre, April 29; Chirnside, May 3, early, August 10. *Outer Hebrides*—Barra, April 26. *Argyll and Isles*—Tiree, May 18. *Clyde*—Cathcart, April 25. *Solway*—Mull of Kintyre, May 19.

Earliest, April 25, Morningside, Edinburgh, and Cathcart.

Rallus aquaticus (Water Rail).

Argyll and Isles—Tiree, Nov. 5.

Œdicnemus scolopax (Stone Curlew).

Muirhouse, August 12 (see "Annals," 1897, p. 225).

Eudromias morinellus (Dotterel).

Moray—Badenoch, Glen Feshie, June 30. Have young.

Charadrius pluvialis (Golden Plover).

Shetland—June 28, beginning to flock. *Orkney*—North Ronaldshay, July 12, many. *Sutherland*—Dunnet Head L.H., May 5, in flocks; May 29, eleven. *Moray*—Badenoch, April 6, still in flocks. *Dee*—Peterhead, Sept. 29, numerous. *Tay*—Auchinblae, Sept. 26, flock; Tayfield, Oct. 16, first big flock. *Forth*—Dalmeny, Oct. 2. *Outer Hebrides*—Monach, Oct. 1, one killed at lantern; Oct. 6, flock. *Argyll and Isles*—Tiree, Sept. 16, in large flocks; Oct. 10, enormous flocks. *Clyde*—Langside, Aug. 28, flock.

SQUATAROLA HELVETICA (Gray Plover).

Orkney—Pentland Skerries, Dec. 6-10. *Forth*—Dalmeny, Feb. 12. *Argyll and Isles*—Tiree, Aug. 28, single bird.

STREPSILAS INTERPRES (Turnstone).

Shetland—Yell Sound, July 2, flock of thirty in full summer plumage; North Unst, Sept. 13, four. *Dee*—Rattray Head L.H., April 23, large flock; Peterhead, May 19, about thirty, in summer plumage. *Forth*—Gullane, April 19, seven; Isle of May, Aug. 19, small flock. *Outer Hebrides*—Monach, Oct. 9. *Argyll and Isles*—Skerryvore, Aug. 13, a flock, first arrivals. *Clyde*—Girvan, Aug. 8, twenty or thirty. *Solway*, Aug. 10.

PHALAROPUS FULICARIUS (Gray Phalarope).

Solway—Kelton, Sept. 19, one obtained (see "Annals," 1897, p. 125).

SCOLOPAX RUSTICULA (Woodcock).

Shetland—North Unst, Oct. 25, killed at lantern. *Orkney*—North Ronaldshay, Nov. 20, four seen. *Dee*—Kinnairds Head, Nov. 23, killed at lantern. *Forth*—Pentlands, April 20. *Outer Hebrides*—Monach, Oct. 24, at lantern. *Argyll and Isles*—Dhuheartach, Oct. 23, on rock; Nov. 5, all night at lantern, S.E. fresh breeze; Nov. 6, about twenty resting on rock. Tiree, Oct. 31. Skerryvore, Nov. 5, two seen in rush of Turdidæ, etc. *Clyde*—Pladda, Feb. 26, one killed; Ailsa, Oct. 19, one.

GALLINAGO MAJOR (Great Snipe).

Solway—Crocketford, Oct. 2, first authentic record (see "Annals," 1897, p. 125).

GALLINAGO CŒLESTIS (Common Snipe).

Orkney—North Ronaldshay, Aug. 10; Pentland Skerries, Nov. 24, Dec. 2-28. *Sutherland*—Dunnet Head L.H., Sept. 1. *Outer Hebrides*—Monach, Oct. 1, killed at lantern; Oct. 24, killed. *Argyll and Isles*—Tiree, Oct. 12, "coming in thick."

GALLINAGO GALLINULA (Jack Snipe).

Forth—Isle of May, Oct. 22 (leg and wing sent). *Argyll and Isles*—Skerryvore, Oct. 1-2, three killed at lantern; Tiree, Oct. 4.

TRINGA STRIATA (Purple Sandpiper).

Sutherland—Dunnet Head L.H., Aug. 11-13. *Dee*—Rattray Head L.H., Oct. 30, killed on lantern. *Forth*—Isle of May, Aug. 19, small flock.

Tringa canutus (Knot).

Dee—Rattray Head, April 23, flock. *Forth*—Aberlady, May 13, seven in summer dress; North Berwick, Aug. 12, three. *Outer Hebrides*—Barra, Jan. 6. *Clyde*—Turnberry, Aug. 30.

Calidris arenaria (Sanderling).

Clyde—Turnberry, Aug. 31.

Totanus hypoleucus (Common Sandpiper).

Shetland—Brae, July 14, two. *Moray*—Badenoch, April 16. *Dee*—Peterhead, Aug. 8. *Forth*—Pentlands, April 16; Dollar, April 21; North Berwick, Aug. 20. *Tweed*—Hallmyre, April 24, several. *Outer Hebrides*—Barra, April 23, three, many later. *Argyll and Isles*—Tiree, Sept. 13, have left. *Clyde*—Carluke, April 3; Lamlash L.H., April 23, a pair, first seen on island; Giffnock, Sept. 2; Ailsa, Sept. 3.

Earliest, April 3, Carluke.

Totanus canescens (Greenshank).

Forth—Port Edgar, Feb. 4, "Tide-waif." *Outer Hebrides*—Barra, June 20, one, unusual time, do not breed. *Argyll and Isles*—Tiree, Aug. 28, a pair.

Limosa lapponica (Bar-tailed Godwit).

Forth—Aberlady Bay, May 13, flock of 15, all gray; July 21, 95 (20 red-breasted). Dalmeny, Aug. 16. *Argyll and Isles*—Tiree, Aug. 29; Sept. 21, several.

Numenius arquata (Curlew).

Orkney—Kirkwall, May 27, nesting. *Dee*—Peterhead, Aug. 23-24, on migration. *Tay*—Auchinblae, March 10, arrived at breeding ground. *Outer Hebrides*—Island Ghlais, Aug. 20, flock passing S.W. *Argyll and Isles*—Skerryvore, Aug. 7, 9, 24, flocks going S.; Dhuheartach, Aug. 24; Tiree, Sept. 23, have arrived. *Clyde*—Pladda, March 10, one killed, came right through the plate-glass of lantern.

Numenius phæopus (Whimbrel).

Orkney—Stromness, May 27, solitary bird. *Forth*—North Berwick, Aug. 4, several; Dalgetty Bay, Sept. 25. *Outer Hebrides*—Barra, May 3, many; Aug. 17, returning south. *Argyll and Isles*—Tiree, April 26, plentiful; May 1, large flocks. *Clyde*—Garrock Head, Bute, June 4; Fairlie, Aug. 5; Ailsa, April 6, Aug. 23.

Sterninæ (Terns).

Orkney—Irganess Bay, *S. cantiaca* (Sandwich Tern), May 31, solitary bird. *Sutherland*—Dunnet Head L.H., "Terns," Oct. 16. *Dee*—Rattray Head, "Terns," April 30, first seen. Peterhead, *S. fluviatilis* (Common Tern), May 19, many; *S. minuta* (Little Tern), May 19, "never saw so many before." *Tay*—Ballinluig, May 3, *S. fluviatilis*. *Forth*—Inch Mickery, May 3; Longniddry, Sept. 28. *Outer Hebrides*—Barra, *S. macrura* (Arctic Tern), May 4, one; May 15, many. Monach, "Terns," Sept. 11, last seen. *Argyll and Isles*—Dhuheartach, "Terns," May 14, first seen; May 15, great numbers all day. Tiree, *S. minuta*, May 14, arrived; *S. macrura*, May 15; *S. fluviatilis*, May 15; "Terns," Sept. 20, have left. Skerryvore, *S. fluviatilis*, May 19, flock. *Clyde*—Pladda, "Terns," May 16-18, Aug. 1.

Larinæ (Gulls).

Forth—E. Lothian, *Larus minutus* (Little Gull), May 11, adult ♀ found dead near Ballencrieff. *Outer Hebrides*—Barra, *L. leucopterus* (Iceland Gull), Jan. 6, Nov. 17; Stornoway, *L. leucopterus*, procured about end of August; Barra, *L. glaucus*, Nov. 14. *Argyll and Isles*—Tiree, *L. glaucus*, March 7; Dhuheartach, *L. leucopterus*, Nov. 12.

Stercorarius pomatorhinus (Pomatorhine Skua).

Solway—August 18, Solway Firth.

Mergulus alle (Little Auk).

Dee—Peterhead, Nov. 13. *Tay*—Johnshaven, Feb. 13, large numbers. *Forth*—Jan. and Feb., numbers stranded on shores.

Podicipedidæ (Grebes).

Forth—Dalmeny, *P. cristatus*, Feb. 3, Nov. 23. *Argyll and Isles*—Tiree, *P. auritus* (Sclavonian Grebe), Nov. 25.

Fulmarus glacialis (Fulmar).

Shetland—Nesting at Calder's Geo. *Solway*—Mersehead Bank, picked up in Dec.

Pelagodroma marina (Frigate Petrel).

Argyll and Isles—Colonsay, Jan. 1 (see "Annals," 1897, p. 88).

NOTES ON SOME SCOTTISH MARINE ISOPODS.

By Thomas Scott, F.L.S.,
Naturalist to the Fishery Board for Scotland.

Several small marine Isopods have occasionally been observed in gatherings of dredged and other material collected during the past six or seven years, but the study of them was for various reasons allowed to stand over. The second volume of Professor G. O. Sars's valuable work on the "Crustacea of Norway," though not yet completed, has been of much assistance to me in the discrimination of these small Isopods, and has permitted of the satisfactory identification of, at least, some of them. The following notes have been prepared with the assistance of the work alluded to, and include references to a few rare species already recorded for Scotland, extending in some cases their distribution in the Scottish seas. A few others are referred to that do not appear to have been previously recorded from any locality in Scotland: one or two of these are also additions to the British fauna.

Changes in the nomenclature of some of the species already recorded are also noticed. For details as to general distribution, etc., the reader is referred to Sars's work mentioned above, as my notes have reference chiefly to Scotland.

Apseudes talpa (*Montagu*).

This species is recorded by the late Dr. Robertson of Millport as having been taken amongst the roots of *Laminaria* at the Tan, Cumbrae, in seven fathoms;[1] so far, this is the only Scottish record for Montagu's species known to me.

Tanais tomentosus, *Kroyer*.

This is the *Tanais vittatus* of Bate and Westwood's "British Sessile-eyed Crustacea," and it has been recorded for the Clyde under that name. Professor Sars has shown, however, that Kroyer's name—*Tanais tomentosus*—was published in 1842, whereas Rathke's *Crossurus* (*Tanais*) *vittatus* was not published till the following year.

[1] "Amphipoda and Isopoda of the Clyde," Second Part, p. 28. (Dr. Robertson's catalogue is frequently referred to in these notes.)

I found *Tanais tomentosus* more or less common amongst living and dead barnacles on rocks, near low water, at the mouth of East Loch Tarbert, Loch Fyne, in 1886. Dr. Robertson obtained the same species on the wood piles of Millport pier, and on rocks, near low water, Cumbrae.

Paratanais Batei, *G. O. Sars.*

According to Professor Sars, the *Paratanais forcipatus* of Spence Bate is not Lilljeborg's species of that name, but is one previously undescribed; and as it was therefore necessary to rechristen the species, he has named it as above. Thomas Edward is said to have obtained *Paratanais Batei* at Banff, and Dr. Robertson records its occurrence at Cumbrae between tide-marks. I have it from Whiting Bay, Arran, where it was collected in November 1895, and from Tarbert Bank, Loch Fyne, collected in May 1896. The Firth of Forth has also now to be added to the list of Scottish localities for this Isopod—a specimen having been obtained amongst a lot of other Tanaidæ collected off North Berwick in December 1892. It is quite possible there may be some confusion among previous records of *Paratanais Batei*, and that both it and Lilljeborg's species may have been included under Spence Bate's name of *Paratanais forcipatus*. There is, however, one very obvious difference between these two Isopods—*Paratanais Batei* has small but conspicuous black eyes, that are quite distinct even in specimens that have been some years in spirit; in the other species the eyes appear to be altogether wanting, at any rate they are not perceptible in specimens that have been preserved in spirit. The form of the *chelæ* in these two Isopods is also very different.

Leptognathia Lilljeborgi, *Stebbing.*

This species was described and figured in the "Annals and Magazine of Natural History" for October 1891 by the Rev. T. R. R. Stebbing, from specimens obtained in the sands at Lee and Woolacomb, North Devon, in August 1890. A number of specimens of what is undoubtedly the same species have been taken in the Firth of Forth at various times, and the species seems to be generally distributed in that estuary. In May 1891 it was obtained both in Largo Bay and off Musselburgh. It occurred off North Berwick in December 1892, and off Aberdour in November 1893; but I have no special records of it since that time. *Leptognathia Lilljeborgi* appears to be somewhat out of place among the species of that genus described by Sars: these all have the "superior antennæ in the female distinctly 4-articulate," whereas in this one the fourth joint is described as "quite rudimentary." In the specimens from the Firth of Forth I have been unable to satisfac-

torily make out a fourth joint; in one or two instances where there was the appearance of a fourth joint examination with a "higher" objective showed that the appearance was produced by the approximation of the bases of the subterminal setæ; for this reason I was inclined at first to consider the species as a member of the genus *Typhlotanais*, the females of which have the superior antennæ 3-articulate, but as the general structure of the antennæ in the male and female, together with the form of the chelæ, do not fit in well with either genus, it is perhaps better to leave this Isopod where it is for the present. In the female the first joint of the superior antennæ is long, but the other joints are short, and the second appears to be hinged to the first joint, for in some of my specimens the short end-joints bend over at nearly right angles to the first, as if the antennæ were being used as grasping organs.

Leptognathia longiremis (*Lilljeborg*).

This species has been obtained in the Firth of Forth, in the Moray Firth, and also in one or two places in the Clyde district. It was first observed in a gathering of micro-crustacea collected off North Berwick in December 1892, and in another gathering from the same locality collected in January 1894. It was obtained in a similar gathering from Guillam Bank, Moray Firth, collected in 1895, and in another collected in June last, by Mr. F. G. Pearcey, at Smith Bank. Moreover, the same species was taken at Tarbert Bank, Loch Fyne, in 1896, and more recently near the head of the same loch. In this species, as well as in the two that follow, the upper antennæ in the female are "distinctly 4-articulate," and show in this respect and in general structure a marked difference from *L. Lilljeborgi*.

Leptognathia breviremis (*Lilljeborg*).

This species, which is smaller than the last, was obtained in the same gatherings with it from the Firth of Forth and the Moray Firth. A few specimens—two of them with ova—were also observed in a gathering collected at Tarbert Bank, Loch Fyne, in 1896. The length of the Forth specimens measured about one and a quarter millimeter.

Leptognathia brevimana (*Lilljeborg*).

In this species the outer ramus of the uropods appears as if it were merely a spine-like prolongation of the basal joint, and not a distinct branch. This structural peculiarity forms one of the characters of the species. *Leptognathia brevimana* is comparatively a large species: a few of the specimens from the Firth of Forth measured about 2·7 millimeters, exclusive of antennæ or uropods.

I have specimens that were collected in the Firth of Forth in 1891 and 1892; it has also occurred in material dredged at Guillam Bank, Moray Firth, in 1895, and more recently in a gathering collected by Mr. F. G. Pearcey at Smith Bank.

Leptognathia rigida (*Spence Bate*).

Professor G. O. Sars, in his work on the Isopods of Norway (page 26), states that *Paratanais rigidus*, Spence Bate, ought to be referred to *Leptognathia*. Dr. Robertson records this species for the Clyde; it was taken at the roots of *Laminaria* in seven to eight fathoms, near the Tan Buoy, Cumbrae. And I have recorded it for the Firth of Forth; no specimens of the species are, however, in my collection, and it is therefore probable that *Leptognathia Lilljeborgi*, or some other species, has been mistaken by me for this one.

Tanaopsis laticaudata, *G. O. Sars.*

Professor Sars first described this as a *Leptognathia*, but afterwards changed its name to *Tanaopsis*. Dr. Robertson recorded this species (under the older name) in 1892, from Fairland Point, Cumbrae; and the Rev. Mr. Stebbing, in his paper on *L. Lilljeborgi*, refers to its occurrence at Kames Bay, also in the neighbourhood of Cumbrae. *Tanaopsis laticaudata* appears to be widely distributed around the coast of Scotland. I found it fairly common, and of large size, in Loch Gair (Loch Fyne). Professor Sars gives 2.6 millimeters as the average size of the species, but some of the Loch Gair specimens measure fully 3.5 millimeters. I have observed the species in other parts of the Clyde district, and also off Arisaig as well as in the Moray Firth and in the Firth of Forth: specimens from the latter estuary have been in my collection since 1891.

Pseudotanais forcipatus, *Lilljeborg.*

This species was moderately common in some material dredged at Guillam Bank in August 1895: both males and females occurred in this material. A few specimens were also observed in a small gathering of micro-crustacea from Smith Bank collected by F. G. Pearcey in June last. These appear to be the only Scottish records of this species hitherto; but, as has been already said, the *Paratanais forcipatus* recorded from the Clyde and from Banff may include both *Paratanais Batei* and the present species.[1]

[1] After these Notes had gone to press I obtained a few specimens of *Pseudotanais forcipatus* in a gathering of small Crustacea from Tarbert Bank, Loch Fyne, collected 31st March 1897.

Gnathia maxillaris (*Montagu*).

This Isopod, which is moderately common, is more familiar under the name of *Anceus maxillaris*. *Gnathia* is the generic name established by Leach in 1814, and must, as stated by Professor Sars, be preferred to that of *Anceus* or *Praniza*. *Anceus* (*Praniza*) *Edwardii*, Spence Bate, is, according to Sars, only the female of *Gnathia maxillaris*.

Cirolana borealis, *Lilljeborg*.

This is the form described in Bate and Westwood's "Sessile-eyed Crustacea" as *Cirolana spinipes*. Dr. Robertson records it from the Clyde, and Mr. Gregor has taken it in the Moray Firth. I have also observed it in both these districts. (*Cirolana Chranchii*, Leach, has also been recorded from the Clyde by Dr. Robertson, but this species I have not yet observed.)

Idothea baltica, *Pallas*.

This Isopod is more generally known under the name of *Idothea tricuspidata*, Desmarest. Professor Sars adopts Pallas's name as being prior to that of Desmarest, and also in preference to *Idothea* (*Oniscus*) *marina*, Linné, because he considers it very doubtful if the Linnean name refers to this species. *Idothea baltica*, it is hardly necessary to add, is the most common of our "Sea-sclaters."

Idothea pelagica, *Leach*.

The present form has been included with *I. baltica* under the common name of *I. marina* as not being specifically distinct; but Professor Sars remarks that it could not have been the true Leachian species that had been under examination, as it is impossible to confound that species with *I. baltica*. *Idothea pelagica* appears to be much less common than the other; it is also considerably smaller in the adult stage. Dr. Robertson records this species from Cumbrae, Firth of Clyde, and states that it has been taken at various localities on the English, Scottish, and Irish coasts. In 1886 I collected a number of specimens, male and female, at East Loch Larbert, Loch Fyne. Some of the latter which carried ova did not exceed 7 millimeters in length.

I would note in passing that there are two other species of *Idothea* described by Professor Sars that may also occur on the coast of Scotland, viz. *Idothea neglecta*, G. O. Sars, and *Idothea viridis* (Slabber). The first is not unlike *I. pelagica* in general appearance, but is larger, and has the inferior antennæ longer and more slender; this species is more or less abundant along the whole Norwegian

coast. The second has been taken "rather plentifully in the Christiania Fjord in quite shallow water among eel-grass"; it is also recorded by Hoek from both the Dutch and French coasts. *I. viridis* is nearly of the same length as *I. pelagica*, but is much narrower, "being more than four times as long as broad," and is of a uniformly greenish colour.

Astacilla longicornis (*Sowerby*).

This is the *Arcturus longicornis* of Bate and Westwood's "Sessile-eyed Crustacea." It has been shown, however, that *Arcturus* is not only of later date than *Astacilla*, but refers to a different genus. *Astacilla longicornis* is, under the name of *Arcturus*, recorded from several Scottish localities. Sars considers the *Arcturus gracilis* of Goodsir to be the adult male of *A. longicornis*.

Arcturella dilatata, *G. O. Sars.*

The late Dr. Robertson records this for the Clyde under the name of *Leacia dilatata*. Professor Sars has, for reasons stated by him, established a new genus (*Arcturella*) for this Isopod. Dr. Robertson's is the only Scottish record known to me for this species.

Iæra marina (*Fabricius*).

Professor Sars adopts Fabricius' specific name in preference to *albifrons* of Leach. "There cannot," he says, "be any doubt that the *Oniscus marinus* of O. Fabricius is this species," and, being the older name, ought to be preferred to that of Leach. He is also doubtful if the *Iæra Nordmanna* figured by Bate and Westwood is Rathke's species of that name; it seems rather to be the male of *I. marina*.

Munna Boecki, *Kroyer.*

This species may be distinguished from *Munna Kroyeri* by its greater size, and especially by the structure of the superior antennæ in the adult and by the armature of the caudal segment. The flagellum of the superior antennæ in the adult is usually six-jointed, but in immature specimens the number of joints is less; the caudal segment resembles that of *M. Kroyeri* in having the anterior portion of both margins armed with a few prominent spiniform teeth, but differs in having the apical lamellæ also coarsely serrated. A number of specimens of *M. Boecki* with ova occurred in a gathering of the micro-crustacea from the vicinity of Ailsa Craig, Firth of Clyde, collected in April 1897, and it has also been obtained in Kilbrennan Sound. In the Moray Firth and in the Firth of Forth immature specimens apparently belonging to the same species have also been observed.

Munna Kroyeri, *Goodsir.*

Goodsir described this species from specimens obtained in the Firth of Forth, where I have also taken it. Dr. Robertson records *M. Kroyeri* from the vicinity of Cumbrae, Firth of Clyde; it does not appear to be a very common species. *Munna Whiteana*, Spence Bate and Westwood, which has also been recorded for the Clyde, is, according to Sars, only the female of *M. Kroyeri*. This species, it may be noted, has the anterior portion of the margins of the caudal segment toothed as in *M. Boecki*, but the apical lamellæ are not serrate.

Paramunna bilobata, *G. O. Sars.*

I collected a number of specimens of this Isopod in East Loch Tarbert, Loch Fyne, in 1886, but being unable at that time to determine the species, they were put aside and forgotten. Last year, when examining a small gathering of micro-crustacea collected by F. G. Pearcey at Otter Spit, Loch Fyne, I observed this species, and recorded it in "The Annals of Scottish Natural History" for January last, stating that it appeared to be new to the British fauna; shortly afterwards the East Loch Tarbert specimens collected in 1886 turned up. Besides these Clyde records, I have now also to record *Paramunna* for the Firth of Forth, having found it in gatherings of micro-crustacea collected in that estuary in 1894 and 1895.

Pleurogonium rubicundum, *G. O. Sars.*

I have obtained this little Isopod in gatherings of micro-crustacea from the Firth of Forth collected in 1894 and 1895, and also from Aberdeen Bay, but it seems to be a scarce species. In this species the lateral extremities of the four anterior segments of the mesosome are rounded or only slightly angular, and have each a short, straight, and blunt-pointed spine projecting from the middle of them. I have not yet observed this species in the Clyde, but it may likely occur there also. Off Montrose, 1892.

Pleurogonium inerme, *G. O. Sars.*

The late Dr. Robertson has dredged this species off Farland Point, Cumbrae, Firth of Clyde, and records it in the second part of his catalogue of Clyde Amphipods and Isopods. It also occurred amongst some micro-crustacea from South Bay, Firth of Forth, collected in April 1891, of which this is the first record: one or two of the Forth specimens carried ova. *Pleurogonium inerme* is somewhat like the last species, but it wants the lateral spines; it appears to be rare in the Scottish seas. Also in Moray Firth, May 1893.

PLEROGONIUM SPINOSISSIMUM, *G. O. Sars.*

Dr. Robertson records this species also from the Clyde, having obtained it in the same locality with the other. This appears to be the only Scottish record of the species hitherto. Though no specimens of *Pleurogonium spinosissimum* have yet been observed during our researches round the coasts of Scotland, I have had the opportunity of examining specimens from other places. The extremities of the body segments are remarkably angular in *P. spinosissimum*. In all the three species the body is comparatively broad and considerably depressed, and as the legs are slender and easily broken perfect specimens are hardly obtainable.

PSEUDARACHNA HIRSUTA, *G. O. Sars.*

This is another of the curious Isopod species that have been discovered by Professor Sars. A single specimen of a Crustacean apparently belonging to this species was obtained in a small gathering collected by F. G. Pearcey in the Moray Firth in June last; it was taken on a muddy bottom, in about 40 fathoms, north-east of Lossiemouth. In this species the forehead is broadly rounded and is sparsely fringed with short hairs.

EURYCOPE (?) PHALANGIUM, *G. O. Sars.*

In my "Fishes and Invertebrates of Loch Fyne," published last year, I record *Eurycope phalangium*. I have now obtained what appears to be the same species in a gathering of micro-crustacea from the Firth of Forth collected in 1895: it appears to be a rare species.

There are still one or two other small Isopods to record, but they require further study and will have to stand over for a short time.

RECORDS OF SCOTTISH PLANTS FOR 1897, ADDITIONAL TO WATSON'S "TOPOGRAPHICAL BOTANY," 2nd Ed. (1883).

By ARTHUR BENNETT, F.L.S.

THESE records show a larger number than for 1896; but with these a few of 1898 are incorporated.

I trust in the future these "Records" will appear more regularly.

With those of this year I hope to give some "Corrections,

etc.," that have accumulated while these Reports have been appearing.

The abbreviations, etc., are the same as in former records, viz. "Ann. S. N. H." = Annals of Scottish Natural History"; "J. B." = "Journal of Botany"; *sp.* denotes that a specimen was sent me, and † denotes that I have seen a specimen labelled as from the county.

73. Kirkcudbright.

Blysmus compressus, *J. M'Andrew, sp.*

75. Ayr.

†Lepidium Draba, *A. Somerville.*
†Geranium Phæum, *Miss Henderson.*
†Medicago sylvestris, *A. Gilchrist.*

76. Renfrew.

Ranunculus floribundus, *A. Smith*, "*teste* Hiern."
Papaver Argemone, *R. S. Houston, sp.*
†Geranium Phæum, *Miss Henderson.*
Drosera anglica, Utricularia vulgaris } *R. S. Houston, sp.*

77. Lanark.

†Lepidium Draba, *A. Somerville.*

84. Linlithgow.

(Records by and *sps.* from *A. Somerville.*)

Ranunculus bulbosus.
Nymphæa alba.
Viola Reichenbachiana.
Geranium pratense.
Lychnis vespertina.
Stellaria uliginosa.
Montia fontana.
Œnanthe crocata.
Sambucus nigra.
Arctium minus.
Sonchus asper.
Hieracium vulgatum.
Convolvulus arvensis.
Polygonum amphibium.
Salix alba.
Ulmus montana.
Sparganium ramosum.
Carex intermedia.
,, dioica.
,, pulicaris.
Aira flexuosa.
Glyceria fluitans.
Festuca sciuroides.
,, duriuscula.

86. Stirling.

(Records mostly by *Messrs. Kidston and Stirling.*)

Ranunculus peltatus, "*teste* Hiern."
„ floribundus.
Cochlearia alpina. } *A. Somerville.*
†Erysimum cheiranthoides. }
†Reseda lutea.
Drosera anglica.
†Medicago maculata.
Potentilla procumbens.
Alchemilla vulgaris, *var.* alpestris.
Saxifraga sponhemica.
Epilobium roseum.
Hieracium rigidum.
Carduus nutans.
Jasione montana.
†Linaria repens.
†Mentha sylvestris.
Salvia Verbenaca.
†Ballota nigra.
Rumex sanguineus.
Carex paludosa.

87. Perth, West.

(All records from "Flora of Perthshire," by *Dr. F. Buchanan White.*)

Utricularia minor.
„ intermedia.
Lysimachia thyrsiflora.
Potamogeton crispus.
Eriophorum latifolium.
Carex paniculata.
„ aquatilis.
„ limosa.

88. Mid Perth.

"Thalictrum Kochii" } *Somerville*, "*teste* Linton."
Polygala oxyptera }
Pinguicula lusitanica. }
Lysimachia thyrsiflora. } *Dr. White*, in "Flora of Perthshire."
Calamagrostis Epigejos. }

89. Perth, East.

Kobresia caricina. }
Carex atrata. }
Calamagrostis Epigejos. } *Dr. White*, in "Flora of Perthshire."
Festuca rubra. }

90. Forfar.

Pyrola uniflora, *J. S. Miller*, "Edin. Bot. Soc. Trans." of 8th July 1897.

91. Kincardine.

†Linaria viscida, *Trail*, in "Ann. S. N. H.," 1897, p. 52.
†Rhinanthus major, *Trail, l.c.*

92. Aberdeen, South.

Caltha "radicans," *Druce*, in "Ann. S. N. H.," 1897, p. 55.

93. Aberdeen, North.

Ranunculus fluitans, *Trail*, in "Ann. S. N. H.," 1897, p. 52.
Rhinanthus major, *Trail*, *l.c.*

95. Elgin.

Ranunculus Baudotii, *Druce*, "Ann. S. N. H.," 1897, p. 54.
Silene conica, *Druce*, *l.c.*, "native."
Hieracium angustatum, Lindeberg, *Marshall* and *Shoolbred*, "J. B.," 1898, p. 166.
„ boreale, *Marshall* and *Shoolbred*, *l.c.*

96. Easterness.

†Berberis vulgaris
†Erysimum cheiranthoides } *A. Somerville, sp.*
Trifolium filiforme

98. Argyle.

Erodium cicutarium, *P. Ewing, sp.*

99. Dumbarton.

Ranunculus Drouetii, *L. Watt*, "*teste* Hiern.
†Viola odorata, *A. Somerville.*

100. Clyde Isles.

Crambe maritima, *A. Somerville*, confm.
Chelidonium majus } *Ballantyne.*
Lychnis vespertina
Tragopogon pratensis (seg.)
Utricularia neglecta? (no flowers) } *A. Somerville.*
Scirpus lacustris

101. Cantire.

(Records from *sps.* sent by *P. Ewing.*)

Fumaria officinalis.
, Boræi.
Spergularia rupestris.
Carex remota.
Briza media.
Sclerochloa loliacea.
Triticum junceum.

102. South Ebudes (Islay).

(*Dr. Gilmour, sps., ex* A. Somerville.)

†Clematis Vitalba (cult.), to show climate.
Anemone nemorosa.
†Helleborus viridis.

†Acer campestre.
Viola canina.
Sagina apetala.
Hieracium umbellatum.
†Chrysanthemum Parthenium.
Myosotis repens.
Habenaria chlorantha.
Carex sylvatica.
„ pallescens.
Polypodium Dryopteris.
Ophioglossum vulgatum.

103. Mid Ebudes.

(*S. M. Macvicar, sps.*)

Ranunculus bulbosus.
Cochlearia danica?.
Draba verna.
Vicia Orobus, *Rev. J. E. Somerville.*
Helosciadium inundatum.
Valerianella Olitoria.
Centunculus minimus.
Utricularia intermedia.
Scirpus setaceus.
Carex extensa.
Sclerochloa maritima.

104. North Ebudes (Canna).

Fumaria confusa
Hypericum elodes } *S. M. Macvicar, sp.*

107. East Sutherland.

(*Marshall* and *Shoolbred*, in "J. B.," 1898, pp. 166-177.)

Rubus villicaulis, Koehl.
„ radula, Weihe.
„ Balfourianus, Bloxam.
Hieracium auratum, Fr.
Hieracium strictum, Fr.
Zostera nana.
Avena pratensis.
Sclerochloa maritima.

108. West Sutherland.

(*Marshall* and *Shoolbred*, in "J. B.," 1898, pp. 166-177.)

Hieracium globosum, Bach.
„ Sommerfeltii, Lindeberg.
„ cæsio-murorum, Lindeb.
„ dissimile, Lindeb.
„ angustatum, Lindeb.
„ zetlandicum, Beeby.
„ dovrense, Fr.
Epipactis latifolia.
Isoetes echinospora.
Carex chordorhiza, Linn. (Ehrh.) Near Loch Naver, 4th August 1897. "J. B.," 1897, vol. xxxv., p. 450. A good addition to the Scottish Flora.

110. Hebrides.

Isoetes echinospora, *W. S. Duncan, sp.*

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S.

(*Continued from p.* 177.)

[Names of plants in *italics*, except as synonyms within curved brackets, denote that the plants were *certainly* introduced into Scotland by man. † after a district-number denotes introduction by man into the district; "cas." denotes casual occurrence, and "esc." evident escape or outcast from cultivation, both being due to man's agency. Square brackets enclosing the name of a plant or a district-number denote that the record was made in error. ? after a district-number denotes, at least, need of confirmation; after † it denotes doubt as to whether the plant owes its presence in the district to man.]

Compositæ (*continued*).

Hieracium, L. The conclusions arrived at by those who have devoted special study to this perplexing genus in recent years often differ so widely from those accepted by their predecessors that the earlier records cannot, in many cases, be made use of with confidence. I cannot claim to be able to sift these records, and I have therefore asked Mr. F. J. Hanbury to favour me with his assistance. This he has kindly promised to give, but he has been unable yet to revise the records, owing to circumstances beyond control. The consideration of this genus must therefore be deferred.

Hypochœris glabra, *L.*, 75, 87† (?), 90, 91† (?), 95, 96, 100.

H. radicata, *L.*, *except 80.*

[*H. maculata*, *L.*, reported from 90, but in error, or only a casual.]

[1] Leontodon hirtus, *L.*, 72-74, 77 (?), 80, 82, 83, 88 (?), 92 cas., 99† (?), 102.

L. hispidus, *L.*, 72, 73, 75-83, 85, 87, 88 (?), 90, 91, 99, 100, 102, 103, 104 (?), 108, 109.

L. autumnalis, *L.*, *except 84.*

b. pratensis (*Koch*), of frequent occurrence.

Taraxacum officinale, *Web.*, all.

a. Dens-leonis, *Desf.*, the common form.

b. erythrospermum (*Andrz.*), 85, 88, 89, 92, 100, 102.

c. palustre (*DC.*), *except 73, 74, 79, 84, 95, 101, 102, 103, 105, 107.*

d. lævigatum (*DC.*), 85, 92.

Lactuca virosa, *L.*, 75, 81, 83, 85-89.

[1] *Leontodon hirtus*, L.—This has not improbably been introduced by man in some of the districts from which it has been reported as native. The same may be true of *L. hispidus*, L.

[1] L. muralis, *Fresen.*, 83†, 86, 87†, 88†, 94 (?), 95†, 96, 97†, 98†, 104†.
L. alpina, *Benth.*, 90, 92.
Sonchus oleraceus, *L.*, all.
S. asper, *Hoffm.*, *except 80, 94, 95.*
S. arvensis, *L.*, *except 104.*
[*S. palustris*, L., has been recorded from 75 and 83, but apparently in error.]
Tragopogon pratense, *L.*, 72, 73, 75, 77, 80-83, 85-93, 95, 100, 108, 109.
Crepis taraxacifolia, Thuill., 80†.
C. virens, *L.*, *except 110, 112.*
C. biennis, *L.*, 72, 82 (??), 86†, 92†.
C. succisæfolia, *Tausch* (*hieracioides*, W. and K.), 72, 73, 78, 80, 81, 83, 85 (?), 87, 88, 90, 91 (?), 92, 94, 99.
C. paludosa, *Mœnch*, *except 110, 111, 112.*

Campanulaceæ.

Lobelia Dortmanna, *L.*, 72-75, 77, 86-92, 94, 106, 108-112.
Jasione montana, *L.*, 72-77, 79, 86, 88 once, 91, 95, 97-102, 111, 112.
b. major, *Koch*, 112.
Wahlenbergia hederacea, *Reichb.*, 75, 76, 98.
Phyteuma spicatum, L., casual, in 88.
Campanula glomerata, *L.*, 82, 85, 88-91.
C. Trachelium, *L.*, 72, 73, 75, 77, 82, 83 (?), 85, 86†, 88 cas.
C. latifolia, *L.*, 72-77, 79-81, 82 (?), 83, 85-90, 91† (?), 92-94, 97, 99, 102†.
C. rapunculoides, L., 73†, 82†, 83†, 85†, 88†, 89†, 90†, 92†.
C. rotundifolia, L., *except 111.*
b. lancifolia, *Mert.* and *Koch*, Perthshire.
d. hirta, *Rich.*, 89
C. persicifolia, L., escape, in 72, 87, 88, 89.
C. Rapunculus, L., 85†, 95†.
Specularia hybrida, *DC.*, 82†, 85†.

Vacciniaceæ.

Vaccinium Vitis-idæa, *L.*, *except 74, 82, 84, 91, 101, 112.*
V. uliginosum, *L.*, 72, 87-90, 92, 94, 96-98, 105, 106, 108, 111, 112.
V. Myrtillus, *L.*, all.
Schollera Oxycoccos, *Roth*, *except 78, 79, 82, 84, 93, 95, 97, 100, 101, 107, 108, 109, 110, 111, 112.*

[1] *Lactuca muralis*, Fresen.—Generally recorded as an introduction, though sometimes in localities that give it the aspect of a native species.

Ericaceæ.

Arctostaphylos alpina, *Spreng.*, 90, 92 (?), 96, 97, 105, 106, 108, 109, 111, 112.
A. Uva-ursi, *Spreng.*, 72, 73, 78, 81, 87-92, 94-98, 100, 102-112.
Andromeda Polifolia, *L.*, 72-77, 86, 87.
Calluna Erica, *DC.*, all.
a. glabrata, *Seem.*, is the commoner form, but *b.* incana, *Auct.*, is also widespread.
Erica Tetralix, *L.*, *except 78.*
E. cinerea, *L.*, all.
[E. vagans, *L.*, has been reported from 75, 87, 96, 98, but probably in error.]
Loisleuria procumbens, *Desv.*, 85 (?), 86, 88-90, 92, 94, 96-99, 104-109, 111, 112.
Ledum palustre, *L.*, 86† (?), 87† (?).
Bryanthus taxifolius, *A. Gray* (*Phyllodoce taxifolia*, Salisb.), 88.
Pyrola rotundifolia, *L.*, 73 (?), 75 (?), 77, 78 (?), 80 (?), 81 (?), 83 (?), 85, 87 (?), 88-92, 96, 98, 107, 111, 112.
P. media, *Sw.*, *except 74, 76, 77* (?), *78, 79, 83, 84, 86, 99, 100, 101, 102, 104, 110, 111.*
P. minor, *L.*, *except 78, 81, 82, 98, 99, 101, 109, 110, 111, 112.*
P. secunda, *L.*, 72, 73, 75 (?), 76 (?), 77 (?), 88-98, 104-107.
Moneses grandiflora, *Gray*, 89, 90, 93-98, 106, 107, 110 (?).

Monotropaceæ.

Hypopitys Monotropa, *Crantz*, 93, 96.

Plumbaginaceæ.

Statice Limonium, *L.*, 73, 74, 85.
S. rariflora, *Drej.*, 73, 74.
S. auriculæfolia, *Vahl.*, 74.
a. occidentalis (*Lloyd*), 74.
b. intermedia, *Syme*, 74.
Armeria maritima, *Willd.*, *except 75, 78.*
b. planifolia, *Syme*, 88.

Primulaceæ.

Hottonia palustris, *L.*, 90 (?).
Primula acaulis, *L.*, *except 78.*
P. veris, *L.*, 72, 73, 74†, 75, 76†, 77†, 80-86, 87† (?), 88-94, 95†, 96†, 100†, 108, 109, 111†.
P. elatior, Jacq., 72†, 73†.
P. farinosa, *L.*, 78 (? extinct).

P. scotica, *Hook.*, 94 (??), 108, 109, 111.
Lysimachia thyrsiflora, *Ait.*, 75, 76, 77, 83, 84, 86-90, 99.
L. vulgaris, *L.*, 72-77, 81 (?), 83†, 84, 85†, 86-88, 91†, 92†, 99, 103.
L. ciliata, L., escape in 72, 73.
L. Nummularia, *L.*, 72, 74†, 75, 76, 77†, 78, 79, 80†, 81†, 83†, 85†, 86, 87†, 88†, 89†, 90†, 100†.
L. nemorum, *L.*, *except 112.*
Trientalis europæa, *L.*, *except 73, 74, 78, 80, 82, 84, 101, 102, 103, 104, 105, 110.*
Glaux maritima, *L.*, *except 77, 78, 79, 80, 86, 88, 107.*
Anagallis arvensis, *L.*, *except 78, 79, 92†, 93, 104, 105, 106, 109, 110, 112.*
A. cœrulea, *Schreb.*, 73† (?), 74†, 88 cas., 89 cas., 92 cas.
A. tenella, *L.*, *except 72, 78, 79, 80, 86, 87, 89, 90, 91* (?), *92, 105, 107.*
Centunculus minimus, *L.*, 72 (?), 73, 75, 76, 77 (?), 81, 85, 87-90, 92, 95-97, 100, 103, 110.
Samolus Valerandi, *L.*, 72-76, 81-82, 84, 85, 95, 97-104, 110.

Oleaceæ.

Fraxinus excelsior, *L.*, 72-111, marked † in 85-95, 100-102, 104-111; nativity scarcely to be determined.
Ligustrum vulgare, L., † in many districts, *e.g.* 72-78, 80-83, 85-97, 100-103, 109.

Apocynaceæ.

Vinca major, L., 73†, 92†.
[1] *V. minor*, L., in 72, 73, 75-77, 81, 83-85, 88-92, 94, 95, 103, 107.

Gentianaceæ.

Erythræa Centaurium, *Pers.*, *except 78, 79, 91, 92, 93, 94, 105, 108, 109, 111.*
b. capitata, *Koch*, 73, 74.
[*E. latifolia*, Sm., has been erroneously recorded from 97 and 103.]
E. littoralis, *Fr.*, 72-75, 82, 91, 93 (?), 94-98, 100-102, 106, 107, 110, 112.
E. pulchella, *Fr.*, 72, 82, 102.
Gentiana nivalis, *L.*, 88, 90 [97, error].
G. Amarella, *L.*, 80-83, 86, 88, 90, 92-95, 102, 105-109, 111, 112.
G. campestris, *L.*, *except 84.*
G. baltica, *Murbeck*, 98, 101, 108.
Menyanthes trifoliata, *L.*, all.
Limnanthemum peltatum, Gmel., † in 77, 81, 88, 89 (?).

[1] *V. minor*, L., despite its frequent profusion, must be regarded as introduced by man into Scotland. I have never seen fruit upon it in Scotland.

Polemoniaceæ.

Polemonium cœruleum, L., † or casual, in 72-75, 77, 81-87, Perthshire, 90, 92, 94, 100, 102, 109.

Boraginaceæ.

Cynoglossum officinale, *L.*, 75†, 77†, 81-85, 88-90, 91† (?), 93†, 94†, 96†, 106†, [111].

C. germanicum, *Jacq.* (*C. montanum*, Lam.), 88, 89† (?), 90†.

Asperugo procumbens, L., † in 77, 82, 85, 90, 93, 95, 106, 107.

Echinospermum Lappula, L., casual, in 92.

Symphytum officinale, *L.*, 72-77, 79, 80†, 81, 83, 84†, 85, 86, 87†, 88†, 89†, 90†, 91†, 92†, 93†, 99†, 100†, 109†.

b. patens (*Sibth.*), 72, 74, 87†, 88†, 89†.

S. tuberosum, *L.*, 72†, 73†, 74†, 75-77, 79, 81-94, 95†, 98, 99, 102, 106.

S. asperrimum, Bab., 72†, 74†, 92 cas.

Borago officinalis, L., casual, in 72-74, 86, 88, 92, 99, 100.

Anchusa sempervirens, L., † in 72-74, rare in Perthshire, 91, 92.

Lycopsis arvensis, *L.*, *except 78, 103.*

Pulmonaria officinalis, L., casual, in 72, 74.

Pneumaria maritima, *Hill* (*Mertensia maritima*, Don.), *except 77, 78, 79, 80, 82, 83, 84, 86, 87, 88, 89, 99, 102, 107.*

Myosotis cæspitosa, *Schultz*, all.

M. palustris, *With.*, *except 94* (?), *95* (?), *96* (?), *97, 101, 104, 105, 106* (?), *107* (?), *108* (?), *110* (?), *111, 112* (?).

b. strigulosa, *Mert.* and *Koch*, 72, 74, 84, 87, 88, 89, 92, 93, 99, 106, 111.

M. repens, *G. Don*, *except 82, 84.*

M. alpestris, *Schmidt*, 88, 90†.

[1] M. sylvatica, *Hoffm.*, 72, 73, 77 (?), 79-81, 83, 86, 87†, 88†, 89†, 90, 91† (?), 92†, 104.

M. arvensis, *Lam.*, all.

b. umbrosa, *Bab.*, 72-74, Perthshire.

M. collina, *Hoffm.*, *except 74, 78, 79, 80, 87, 97, 98, 99, 100, 101, 103, 104, 108, 110, 111, 112.*

M. versicolor, *Reichb.*, all.

Lithospermum purpureo-cœruleum, L., 85†.

[2] L. officinale, *L.*, 73, 74†, 76†, 77†, 82, 83†, 85, 87†, 88† (?), 90, 91† (?), 95, 96 (?), 100, 101, 111† (?).

[3] L. arvense, *L.*, 72, 73, 75-78, 80-86, 88-96, 106, 110.

[1] *Myosotis sylvatica*, Hoffm.—The claims of this species to be indigenous in several of the above districts are probably ill founded.

[2] *Lithospermum officinale*, L.—The distribution of this is such as to suggest its introduction by man in many habitats.

[3] *L. arvense*, L.—The same remark applies to this, though less strongly.

[1] Echium vulgare, *L.*, *except 72†, 73† (?), 74† (?), 78, 79, 91† (?), 97, 98, 99, 101, 103, 104, 105, 107, 108, 112.*

CONVOLVULACEÆ.

[2] Volvulus sepium, *Junger* (*Calystegia sepium*, R. Br.), 72-77, 81†, 82, 83, 85†, 86, 87†, 88†, 89†, 90†, 92†, 95†, 97†, 98†, 99-103, 109†.

V. Soldanella, *Junger* (*C. Soldanella*, R. Br.), 72†, 73† (?), 74† (?), 75, 82 (?), 87, 90, 97 (?), 100-103, 110.

[3] Convolvulus arvensis, *L.*, *except 72†, 78, 79, 80, 92†, 93, 94, 97, 101, 103, 105, 108, 110, 111, 112.*

[4] *Cuscuta Epilinum*, Weihe, 72†, 88†.

C. europæa, L., 72 (?), 77 (?), 80†, 83 (?), 89 cas., 90 (?).

C. Epithymum, *Murr.*, 73†, 75, 77†, 83 (?).

C. Trifolii, Bab., 75, 76 (?), 80-83, 85, 86, 88 cas., 89 cas., 90, 92†, 93†, († probably in all these).

(*To be continued.*)

ZOOLOGICAL NOTES.

An Obscure Point in the History of the Cadzow Herd of White Cattle.—Not a little uncertainty surrounds the break in the continuity of the Cadzow herd of White Cattle in the end of the last and the beginning of the present century. Pretty full details of the evidence of contemporary writers on the subject may be found in the late Robert Turner's article on this herd in the "Transactions of the Natural History Society of Glasgow" (vol. ii., N.S., pp. 222-244). Mr. Turner laid considerable stress on the note of Sir Walter Scott in the introduction to his ballad "Cadzow Castle," wherein he states that they were extirpated "about forty years ago," say 1760. Scott's evidence is, however, conflicting—a fact of which Mr. Turner was apparently unaware. There is first in order of dates the above quoted statement. The ballad was completed, Lockhart tells us, before the appearance of vols. i. and ii. of the "Border Minstrelsy" in 1802. In "The Bride of Lammermoor" (1819), chap. iv., there

[1] *Echium vulgare*, L.—In the north-east of Scotland, at least, this plant is so often a weed of cultivated ground or of roadsides as to point to its distribution by man.

[2] *Volvulus sepium*, Junger, should probably have † after a good many more vice-county numbers.

[3] *Convolvulus arvensis*, L., is extremely local in north-east Scotland; indeed, it occurs near Aberdeen, where not evidently introduced by man, only by one roadside, where it is rare and does not increase.

[4] *Cuscuta*, L.—No *Cuscuta* (except perhaps *C. Epithymum*) appears to be indigenous in Scotland.

are two paragraphs relating to "wild cattle," which, however, have been "extirpated at the places we have mentioned," *i.e.* Hamilton, Drumlanrig, and Cumbernauld. This agrees with the former statement, but it is curious to find that in 'Peter's Letters to his Kinsfolk,' by J. G. Lockhart, published in "Blackwood's Magazine" in the same year (1819), there is a lively description of the Cadzow cattle from personal observation. "They are white or cream-coloured all over, but have their hoofs and horns and eyes of the most dazzling jet. The fierceness of the race, however, would seem to have entirely evaporated in the progress of so many ages, for the whole herd lay perfectly quiet while our grave trio passed through the midst of them." In "Castle Dangerous" (1831) Scott again refers to the cattle in Note B, where he states that they "were, in the memory of man, still preserved in three places in Scotland—namely, Drumlanrig, Cumbernauld, and the upper park at Hamilton Palace, at all of which places, except the last, I believe, they have now been destroyed on account of their ferocity." This statement traverses what he had written previously. He had apparently learned, possibly through Lockhart, of the re-introduction at Cadzow, but it is unfortunate that he throws no light on the source of the restored herd, and this remains still a matter of conjecture.—JOHN PATERSON, Glasgow.

Polecat in Elginshire.—The Polecat is not quite extinct in Elginshire yet. A large male was killed at Whitewreath, about four miles south of Elgin, last January. Few of the young people have ever seen a Polecat alive in this district, and I only know of three or four having been trapped here during the past thirty years.—WILLIAM TAYLOR, Lhanbryde.

Lesser Rorqual in the Moray Firth. — A beautiful male Lesser Rorqual (*Balænoptera rostrata*) was captured in a fishing-net off Portknockie on the 14th of August last. It was towed into Portknockie Harbour, where it lay for some days. The baleen was beautiful creamy white, but the boys had been helping themselves to specimens before I saw it. The bands down the throat and chest were pure white, with slate-coloured grooves between. The white patch on the outside of the arm was well marked. The body was nearly black on the dorsal surface. I took the following measurements:—Total length, 24½ feet; greatest girth, 13 feet; from snout to blowhole, 3½ feet; height of dorsal fin, 1 foot 2 inches; length of pectoral fin, 3 feet 9 inches; breadth of tail, 6 feet 9 inches.—WILLIAM TAYLOR, Lhanbryde.

The Grampus in Clyde.—On Sunday, 5th June, this year, while walking up the west side of the island of Bute, from Etterick Bay to Kilmichael, with Mr. John Robertson, that gentleman drew my attention to two whales proceeding down the Kyles. They might be a mile from the shore, probably less, but with our binoculars

we could plainly see the tall (our estimate three and a half feet) dorsal fin, with a prominent hook, and a white patch in the region of the head. We watched them for a considerable time. On my return I looked up the literature of the subject, and have no doubt but that the whales were Killers (*Orca gladiator*). I cannot recall any record of the Killer or Grampus occurring in this area, but the "Finners," well known to yachtsmen, will probably frequently be referable to this species, although they remain undistinguished.—JOHN PATERSON, Glasgow.

Prosecution under the Wild Birds' Protection Acts.—At Cupar, on 5th July, before Sheriff-Substitute Armour, Alexander Greig and Christopher Neilson, labourers, Tay Street, Newport, admitted having taken eighty Terns' eggs at Tentsmuir, contrary to the Order of the Secretary for Scotland, for the Protection of Wild Birds and their Eggs on Tentsmuir. A fine of £1 : 4s., or seven days' imprisonment, was imposed on each of the offenders.

Migrant Wagtails at Peterhead.—Migrant wagtails are a feature of the Peterhead district during the latter three weeks of August. They are everywhere in family parties, which, as the season goes on, unite into flocks of about twenty. The fields where the fishermen spread their herring-nets are a great attraction for these Pied Wagtails (*Motacilla lugubris*), but the most unobserving notice them by the side of small streams or catching flies amid the turnip-fields. They have always struck me as birds that migrate very slowly. Mixed up with them is a fair number of Gray Wagtails (*Motacilla melanope*), but these generally prefer to migrate later in the season. It is but rarely you notice the Yellow Wagtail (*Motacilla rayi*) with them, although they breed in the neighbourhood. Let me add that some years ago, when I resided in Leith, I used to see hundreds of Pied Wagtails, during September, sitting down for their night's rest in nurseries close to the Botanic Gardens and Fettes College. Often I used to go along to see them coming in from all quarters, and regularly before retiring to rest they used to sit in crowds balancing themselves on the wires, or ran in little squadrons along the road.—WILLIAM SERLE, Peterhead.

A Habit of the Black-headed Gull.—Did any of your readers ever note that habit of this gull of fast pattering with its feet in the shallows? Lately I was frequently down on the beach opposite Cramond Island. Here the tide goes far back, and leaves shallow pools. In these pools the gulls stood "beating time" in the most rapid manner, and so making the water muddy. It seemed to be as much a piece of diversion as a means of snatching any food that might be stirred up.—WILLIAM SERLE, Peterhead.

Introduction of the Capercaillie into Inverness-shire.—Three years ago Mr. Dalziel Mackenzie of Farr made an attempt to intro-

duce the Capercaillie (*Tetrao urogallus*), but owing to the arrangements made—the birds being confined like pheasants—they all died of cramp. He then obtained some more birds, some of which were confined in a larger pen, with spruce trees, while others were turned out in the open. This second attempt has succeeded fairly well, for two or three nests were known to have hatched out, and the young were seen. I think the ground is well suited to their requirements, for there are hundreds of acres of fir wood, ranging from old trees to those planted a few years ago.—HEATLEY NOBLE, Henley-on-Thames.

Pochard in Midlothian in Summer.—In consideration of the fact that the Pochard has not yet been found breeding in Midlothian, it is interesting to note that a drake remained all summer on Loch-end Loch. I do not know whether in the early part of the season it was accompanied by a mate or no, but on 16th June it was the only duck on the loch, and on the 29th July its only companion was a Tufted Drake in eclipse plumage. In the summer of 1892 also a Pochard remained on the same loch. On 2nd July 1892 I came on the bird sitting by the water's edge, and was surprised at its exceeding tameness: it allowed me to approach within a short distance before it entered the water. I may also note that in the south of Fife in 1894, and again in 1895, I noticed the Pochard in the nesting-season on a small loch well adapted for this bird.—ROBERT GODFREY.

The Great Shearwater at St. Kilda.—An example of the Great Shearwater (*Puffinus major*) was captured at St. Kilda under the following circumstances. On the 7th of August 1897 Neil Ferguson and his colleagues were fishing a mile or two west of the Dune. While hauling their lines a Shearwater was noticed on the water near to the boat, and in company with some Fulmars (*Fulmarus glacialis*). Ferguson knew at once that the bird was a Great Shearwater, a species concerning which I had in previous years questioned him and others, and desired, if possible, that a specimen should be obtained. At first the fishermen were at a loss how to act, as they had no gun on board the boat. At the suggestion of Ferguson, however, a quantity of ling's entrails was thrown overboard. On this being done, the Shearwater came to the feast at once, before the Fulmars, and Ferguson struck it down with an oar and secured it. Ferguson thinks that this Shearwater breeds on the Dune, because the bird has been obtained there before, and because also there was a bare nesting-patch on the breast of the specimen captured, "the same as is to be seen on the Fulmars." A very fair skin was made of the bird, which I have presented to the collections in the Museum of Science and Art, Edinburgh. I have identified probably two hundred or two hundred and fifty Great Shearwaters in western Scottish waters, but saw none there during the present year.—HENRY EVANS, Jura Forest.

Uncommon Fishes in the Solway Firth.—Besides the Belted Bonito (*Pelamys sarda*) said to have been recently taken in the Solway, other scarce species have been found. I say "scarce" because, although both the fish to be mentioned are very scarce in our waters, they are not by any means rare elsewhere on the British coasts. The first one to note is the "John Dory" (*Zeus faber*), a specimen of which was sent me from Annan lately. That it is an infrequent thing there is proven by the fact that none of the fishermen to whom it was shown had ever seen it before. The other species is a fine little specimen of the Garpike (*Belone vulgaris*) sent me from Carsethorn, where it was found stranded at low tide. The Garpike has been occurring in the Solway more frequently of late years than formerly.—R. Service, Maxwelltown.

Blue Shark in the Firth of Forth.—An example of the Blue Shark (*Carcharias glaucus*), about five feet in length, was caught in a salmon-net at Gullane Point, East Lothian, on 7th July 1898. When I had my attention directed to it, a couple of days later, it lay stranded among the rocks some 300 or 400 yards from the net. I cannot call to mind any previous record of the actual occurrence of the species within the waters of the Forth; but there can be little doubt it occasionally enters the maritime portion of the Firth during the summer months, seeing it is a not uncommon visitor to St. Andrews Bay, and has been captured in the salmon-nets there, as mentioned by Professor M'Intosh in his "Marine Invertebrates and Fishes of St. Andrews," p. 184.—William Evans, Edinburgh.

Spread of the Roach in the Solway District.—Hitherto in our district the Roach (*Leuciscus rutilus*) has been known only from the Lochmaben lochs, the Lochar, the Black Loch of Colvend, and the White Loch of Inch, near Stranraer. For the last year or two numerous specimens have been got from time to time in the little sluggish water of Cargen. It seems to be quite established there. That it is quite a recent immigrant there is positively certain. It was a puzzle where it had come from, until I found recently that Roach had been placed in Terregles ponds by the late Captain Maxwell. There seems no reason to doubt that the Roach of the Cargen are the produce of fish that have escaped from the ponds in Terregles Park.—R. Service, Maxwelltown.

Meta menardi (*Latr.*) **on Ailsa Craig.**—Mr. W. Eagle Clarke has forwarded to me for identification a couple of specimens (both females) and an egg-cocoon of this large cave-loving spider which were sent to him from Ailsa Craig in July last by Mr. Tulloch, lighthouse-keeper there. I have already recorded the species in the pages of this magazine from the Forth and Solway areas. It has also been recorded from Tweed and Dee; but not till now, so far as I know, from Clyde.—William Evans, Edinburgh.

On the occurrence of Corophium affine, *Bruzelius*, in Loch Fyne.—Quite recently, when examining a small gathering of Crustacea collected at Tarbert Bank near East Loch Tarbert, Loch Fyne, in March last year but not examined till now, I obtained a single male specimen of *Corophium affine*. There does not appear to be any previous record of this Amphipod for the Clyde district. It seems to have a moderately wide distribution around the Scottish coasts, as Dr. Norman has recorded it from Shetland, and I have obtained it both in the Firth of Forth and the Moray Firth. It seems, however, to be a rare Amphipod: I seldom find more than one or two specimens at a time. The species is quite a distinct one. The structure of the second antennæ in the male is characteristic, and so are the last pair of uropoda, which are very slender. It cannot be mistaken for any one of the other three British species of *Corophium*.—T. Scott, Leith.

Sirex gigas, *L.*, in Argyleshire.—My friend Dr. J. S. Stewart of Edinburgh, who has been spending a holiday at Glendaruel, Argyleshire, has sent for my inspection a female specimen of this handsome insect which he found on the woodwork of his doorway there on 14th August. I do not know whether the species has previously been noticed in the county.—William Evans, Edinburgh.

Noxious Insects in the Solway District.—The present has been one of the worst seasons for many years in the undue prevalence of injurious insects. These have been further most remarkable in that, with few exceptions, they were species not often noticed to such an extent as to be hurtful. The Corn Grub or larvæ of the "Daddy-long-legs" Fly were complained of in many quarters, and the "Turnip Fly" (which is, however, not a "fly" but a beetle) was also prevalent to a very serious extent. Both are old familiar enemies. But a new foe, *Schizoneura fuliginosa*, a dirty, sooty-coloured Aphide, has done immense damage to young plantations of fir trees, covering the twigs and young shoots in vast numbers. A Scale Insect that I have been unable to find a name for amongst those who specially study the class, has been met with everywhere in countless hordes on laurel bushes, sucking the life sap of the plants, and covering the foliage with masses of black frass. Then arboriculturists have had much reason to ban the Pine Weevil and its doings. The grubs or larvæ of this insect have done very great damage to the roots of young pine trees. Feeding underground, these grubs cannot be got at with the usual insecticides, and have just to be allowed to proceed with their ravages at their own sweet will. The most casual observer must have seen during the hot dry mornings that have prevailed of late, the wet, stained, and sticky appearance of the ground under lime trees. This is the dripping of "honeydew" from *Aphis tiliæ*, the Greenfly of the lime tree, which

has also to be added to the host of insects that have provoked the mildest-mannered horticulturist and arboriculturist to much wrath during the few weeks of this summer.—R. SERVICE, Maxwelltown.

Homalomyia scalaris feeding on Wax.—In April and May this fly is a familiar species. It is most often seen in small parties of a score or more individuals flying together in sportive play under trees during the warmest time of day. Under fruit trees in bloom, more especially under plums, it is often conspicuous. In the larval state it feeds on various decaying substances, usually of animal origin, and has been found as an inmate of, and feeder upon, the debris of wasp nests. In the summer of 1897 a small jar of stoneware that had contained preserves had been filled with fragments of empty honeycomb, placed under a bee hive in my apiary, and then forgotten. It was not noticed again until early in April last, when it was taken into an adjoining shed. Shortly afterwards flies of this species were observed to be congregated upon the shed window, and it was found that they were issuing from amongst the old combs in the jar. Careful notes were taken afterwards of the emergence of the flies. Over 600 in all came forth, and these (with the exception of half a dozen *H. canicularis*, and about a score specimens belonging to other dipterous species) were all *H. scalaris*. They issued from 15th April to 20th May, and the time was during the morning hours up till about ten o'clock. At first only males were noted, afterwards about equal proportions of both sexes, and during the last fortnight the few stragglers were all females. Taking the whole brood, the proportion of males to females was slightly more than two to one.—ROBERT SERVICE, Maxwelltown, Dumfries.

Cyclops Dybowskii, *Lande*.—This comparatively rare *Cyclops* was obtained while I was making an examination of the shore of Loch Lomond near Balmaha on the 21st of June last. I was inclined at first to ascribe this Copepod to *Cyclops oithonoides*, G. O. Sars, but a further examination convinced me that it must be Lande's species; and on comparing notes with my friend Mr. Scourfield, whose recent discovery of *Cyclops Dybowskii* in England has added another to the rapidly increasing number of British freshwater Entomostraca, I found that he also was of the same opinion with myself in regard to the Loch Lomond *Cyclops*. *Cyclops Dybowskii*, which is an addition to the list of Scottish freshwater Copepods, is closely related to *C. oithonoides*; and it requires careful examination to differentiate the two, as the characters that distinguish the one from the other are microscopic. They appear, however, to be distinct.—T. SCOTT, Leith.

Streblocerus minutus, *G. O. Sars*, **in the Dhu Loch, near Rowardennan, Loch Lomond.**—A few specimens of this rare Cladoceran were obtained in a gathering of microcrustacea collected

around the shore of the Dhu Loch in June last. *Streblocerus* is not unlike a *Macrothrix*, and some familiarity with the group is necessary to enable one to discriminate between them. This is the second time I have taken *Streblocerus* in Scotland. It was obtained the first time in Loch Morar in 1892, but was erroneously described in the Fishery Board's Report for 1893 as *Macrothrix laticornis*, Jurine. It seems to be widely distributed, but on account of its habitat and small size it is easily overlooked.—T. Scott, Leith.

BOTANICAL NOTES AND NEWS.

"**Flora of Perthshire.**"—May I ask a little of your space in order to correct a serious blunder in the recent "Flora of Perthshire." Very much to my surprise, I learn that I have seen *Hymenophyllum unilaterale* at Kilmadock. Now I never saw the plant there, and I have a firm conviction that no other botanist will! The same blunder has been made in regard to *Carex vesicaria*, etc. Many years ago I was asked to furnish a full list of the flora of the *Parish of Kilmadock*, and I did so by marking a copy of the London Catalogue. This was sent to Dr. B. White, and as there were some plants new to the county we had some correspondence in regard to the matter, so that Dr. B. White knew very well that the list was a parish flora and not a place one. If I remember right, the parish covers about sixty-four square miles. I shall feel obliged if you would correct a blunder for which I am not in any way responsible. —A. Craig Christie, Edinburgh.

[To supplement this, we quote the following from the "Journal of Botany" for August. Our readers will from it see that Mr. Christie's objection is taken to the name being used for the *parish* of Kilmadock instead of being restricted to the church and its precincts :—

"A Perthshire Note.—In the recently published 'Flora of Perthshire' I read with some astonishment that I have observed a number of plants at 'Kilmadock.' As a matter of fact, I never got one of the plants in question there, but I did get all of them in the parish of that name. I think it is to be regretted that Dr. White and his editor should have known so little of their ground as to confound an old church and its precincts with a parish which covers sixty-four square miles. In every instance the entry ought to read 'parish of Kilmadock.' I was asked to furnish Dr. White with a complete flora of the parish ; I did my best to do so, but Kilmadock as a 'station' was never referred to.—A. Craig Christie."—Ed.]

"**The Flora of Perthshire.**"—I was rather surprised to find that no notice was taken in this work of the fact that I was the discoverer of *Calamagrostis borealis* (*Deyeuxia neglecta*, var. *borealis*), and I

believe the only gatherer of it in Strathtay, since I am afraid it is now destroyed in its original station near Killin. Nor is there any reference to my gathering of *Saxifraga grœnlandica*, L., var. *decipiens* (Ehrh.), on Ben Lawers, although Professor Engler verifies my specimen. The name *S. grœnlandica*, L., is included in the Flora, but no locality or collector's name is mentioned. So far as I am aware, these were the first records of these plants not only for Perthshire, but for Scotland. I failed to find the Saxifrage this year, but I only saw two or three specimens when I first gathered it near the summit of the mountain.—G. Claridge Druce.

Carex xanthocarpa, *Diseg.*—I have this from Portree, Skye.—G. Claridge Druce.

Agrostis pumila, *L.*—I have this from Quiraing, Skye; Dalmally, Argyle; Glen Lyon, Mid Perth; and Torrs, Wigtown.—G. Claridge Druce.

Colours of Flowers and Moisture.—In walking along the Slug Road to-night after a day of rain, the harebells (*Campanula rotundifolia*) on the dry banks by the wayside showed their beautiful characteristic blue. We had been along the same route last night at the same hour (7.30), and had remarked how nearly all the "bells" were of a purple-red colour. Those on the driest soils were redder than the ones on a soil a little damper, but all of them showed a tendency to red. To-night they are all as near as may be of the same shade. Of course the light is much less bright to-night than it was last night, but the main difference must lie in the different amounts of moisture present. Could this be the cause of the decided change in colour?—A. Macdonald, Durris.

Moss new to Britain.—Dr. Braithwaite has informed us that a moss collected on 3rd July 1895 near Cowie Moss, or Craig Moss as it is occasionally called, about three miles south-east of Stirling, is the *Tortula inermis*, Brid., which has not previously been met with in Britain.—R. Kidston; J. S. Stirling.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1898.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Capture of a Golden Eagle. F. F. L. *The Field*, 3rd September 1898, p. 440.—A specimen captured alive on 29th

August at Asknish, Lochgair, measuring 6 feet 7 inches between the tips of the wings, and weighing between nine and ten pounds.

Ivory Gull on the Solway. J. J. Armistead. *Zoologist* (4), vol. ii. p. 414 (September 1898).—Specimen seen in the Firth on 3rd August, and again on the following morning.

Scoters in Summer. J. J. Armistead. *Zoologist* (4), vol. ii. p. 414 (September 1898).—This note refers to hundreds of Scoters seen off Southerness on 7th June last, including four Velvet Scoters. Remarks are also made as to the possible breeding of Red-throated Divers in Wigtown Bay, and on the disappearance of the Chough from the Kirkcudbrightshire coast.

The So-called St. Kilda Wren. H. S. Davenport. *Zoologist* (4), vol. ii. p. 413 (September 1898).—Criticises a statement in the *Spectator* of 30th July, referring to Mr. C. Dixon as the discoverer of this bird in the island.

Notes of the Season—Wigtownshire. Roger S. Gordon. *Ent. Record*, vol. x. p. 204 (August 1898). This note refers to five species of Lepidoptera taken during the season of 1898.

Lepidoptera captured in the Orkney Islands. W. Cheesman. *Ent. Record*, vol. x. pp. 204-206 (August 1898). A list is given of 110 species captured during the last two or three years, with notes on a number of the more interesting forms.

Gelechia confinis, Stn., a Northern form of G. similis, Stn. By Eustace R. Bankes, M.A., F.E.S. *Ent. Mo. Mag.* (2), x. pp. 196-198 (September 1898).—On the probable specific identity of the two, as evidenced by comparison of Perth specimens of the former with specimens of the latter from various English localities.

Some Remarks on the Colour-Varieties of the Species of Orsodacna occurring in Britain. By G. C. Champion, F.L.S. *Ent. Mo. Mag.* (2), ix. pp. 175-176 (August 1898).—Notes given on some Paisley specimens.

Report on the Trawling Experiments of the "Garland," and on the Fishery Statistics relating thereto. *16th Ann. Report Fishery Board Scot.*, pt. iii. pp. 17-87 (August 1898).—Tables given showing (1) the kinds of Fish, (2) the species of Invertebrates, obtained in the Moray Firth and Firth of Clyde.

On the Distribution of Pelagic Invertebrate Fauna of the Firth of Forth and its Vicinity during the Seven Years from 1889 to 1895, both inclusive. By Thomas Scott, F.L.S. *16th Ann. Report Fishery Board Scot.*, pt. iii. pp. 153-210, and pls. iv.-vii. (August 1898).—This useful paper gives particulars of the

Invertebrates captured during the years named by the tow-nets, including Mollusca, Crustacea, Vermes, and Cœlenterata. The plates are in the form of charts showing the distribution and relative abundance of various organisms in the Firth, and the paper concludes with a list of the species of Mollusca and Crustacea referred to in the preceding notes, and showing the stations where they were obtained.

The Invertebrate Fauna of the Inland Waters of Scotland — Part VIII. By Thomas Scott, F.L.S. Including an Account of the Examination of some of the Lochs of Shetland. By Thomas Scott and Robert Duthie. *16th Ann. Report Fishery Board Scot.*, pt. iii. pp. 248-260 (August 1898). —The first part of this paper deals with Lochranza (Arran), Garry Loch (Ailsa Craig), and Park Loch and Tangy Loch, near Campbeltown (Cantyre). The second part deals with the freshwater lochs of Shetland, with notes on their physical aspects. Tables are given in both parts containing the names and showing the distribution of all the species (Mollusca and Crustacea) from the lochs referred to.

Some Additions to the Invertebrate Fauna of Loch Fyne. By Thomas Scott, F.L.S. *16th Ann. Report Fishery Board Scot.*, pt. iii. pp. 261-282, pls. xii.-xv. (August 1898).—Deals with Crustacea, Vermes, and Foraminifera, and describes, amongst others, Pseudotachidius coronatus, gen. et sp. nov. (?); Ascomyzon simulans, sp. nov.; and Neopontius angularis, gen. et sp. nov. An appendix gives some extra notes on some Clyde Crustacea.

Additions to "British Conchology." By J. T. Marshall. *Journal of Conchology*, vol. ix. pp. 65-74 (July 1898).—Numerous Scottish records are given.

Notes from the Gatty Marine Laboratory, St. Andrews No. XIX. By Professor M'Intosh, M.D., LL.D., F.R.S. *Ann. and Mag. Nat. Hist.* (7), vol. ii. pp. 103-118, and pl. ii. (August 1898). —Deals with Scottish specimens of Clione limacina and Bipinnaria asterigera.

BOTANY.

Biographical Index of British and Irish Botanists. By James Britten, F.L.S., and J. S. Boulger, F.L.S. *Journ. Bot.*, 1898, pp. 267-271.—The following botanists, natives of Scotland or writers on the botany of Scotland, are included in the present instalment of the supplement:—Rev. Robert Hunter (1824?-97), Charles Jenner (1810-93), Thomas King (1834-96), George Lawson (1828?-95), John Leitch (1859?-96), David Lyall, M.D. (1817-95).

A Perthshire Note. By A. Craig Christie. *Journ. Bot.*, 1898, p. 319.—Will be found in full on p. 242 of this journal.

Notes from Cantire. By C. E. Salmon. *Journ. Bot.*, September 1898, pp. 338-340.—From near Ardrishaig, enumerates a good many new records for Cantire; and *R. rhamnifolius*, from the vice-county 98 (Argyle), also from near Ardrishaig.

Lonicera Caprifolium in Perthshire. By A. Craig Christie. *Journ. Bot.*, 1898, p. 275.—In Glenfarg.

Euphrasia latifolia, Pursh., in Caithness. By Rev. Edward S. Marshall. *Journ. Bot.*, 1898, p. 274.—Near Thurso.

Gymnadenia conopsea × albida in Scotland. By A. H. Wolley Dod. *Journ. Bot.*, September 1898, pp. 352-353.—From near Arisaig, in West Inverness. It had rose-purple flowers, spur stout and only twice as long as the lip, which latter is intermediate between tricuspidate and trilobed; spike resembles that of *albida*. This example was noticed in the *Gardener's Chronicle* of 23rd July as probably *G. odoratissima*, Rich.

On the occurrence of Carex helvola in Britain. By G. C. Druce, M.A., F.L.S. *Journal of the Linnean Society, Botany*, 1898, vol. xxxiii. pp. 458-464.—Discusses its occurrence on Lochnagar and Ben Lawers, and its relative rank, whether species and hybrid.

Botrychium matricariæfolium, A. Br., and B. lanceolatum, Angst., in Britain. By William Whitwell, F.L.S. *Journ. Bot.*, 1898, pp. 291-297, pl. 388, B and C.—The former was determined from an example found by Dr. O. St. Brody in Ayrshire in July 1887. The identity of *B. rutaceum*, Sw., figured by Newman from a specimen found in 1839 by Mr. Cruickshanks on sands of Barry, in Forfarshire, is discussed, and it is referred to *B. lanceolatum*, Angst.

New and Rare Scottish Hepaticæ. By W. H. Pearson. *Journ. Bot.*, September 1898, p. 340.—Enumerates from West Inverness, collected by Mr. S. M. Macvicar, seven new to Scotland, one not previously recorded from Scotland (though already collected by Dr. Carrington at Loch Maree, and at New Galloway by Mr. J. M'Andrew), and fifteen others new to West Inverness.

Plagiothecium Müllerianum, Schimp., in Britain. By H. N. Dixon, M.A., F.L.S. *Journ. Bot.* (1898), July, pp. 241-246, pl. 387.—Determined from barren specimens gathered by N. Sutherland and A. M'Kinley on Ben Wyvis in August 1867; by James Murray on Ben Narnain, near Arrochar, in July 1896; and by H. N. Dixon on Craig Cailleach, near Killin, in July 1897.

REVIEW.

Life and Letters of Alexander Goodman More, F.R.S.E., F.L.S., M.R.I.A. With Selections from his Zoological and Botanical Writings. Edited by G. B. Moffat, B.A. With a Preface by Frances M. More. (Dublin: Hodges, Figgis, & Co., Ltd., 1898.)

The volume before us is a fitting record of the labours of one who was a worthy successor to the late William Thompson as our leading authority on all subjects connected with Irish Natural History. And in many ways More was Thompson's superior, for his interests were far wider, extending as they did to Botany as well as to Zoology, in both of which branches of natural science—as far as concerned Ireland—More had no equals.

But it was not only in his own work that More's labours were so successfully expended, for he had a wonderful power of attracting to himself workers in all branches of Irish Natural History, to whom it was his delight to suggest lines of research. Although he never really enjoyed robust health, and was seldom able himself to undertake long or arduous expeditions, his interest in the work of others never flagged, and his readiness to help less experienced or younger naturalists was such that for many years his room at the Museum (and later in Leinster Road) was recognised as a sort of meeting-place for all who were interested in Natural History: a place where expeditions were planned, and results brought in and discussed. During this period, hardly a paper on Irish Natural History was published that had not received the benefit of More's advice, or, perhaps, of his actual revision.

Hence it is that the book before us teems with interest for students of all branches of Natural History, and is so different from the number of dry volumes produced nowadays for the eyes of narrow specialists. Not a little of our pleasure in reading the volume was derived from the light thrown by it on much that appertains to the historical part of the subject—a matter too often neglected or untouched of late years. Here we learnt much that was new to us of the past generation of British Zoologists and Botanists, and a great deal more about those who are still working in the same field.

Very great credit is due to Miss More and Mr. G. B. Moffat for the way in which they have accomplished their task. Great as were the opportunities of producing a good book, all have been made use of in a manner only possible to those who are thoroughly conversant with Irish Natural History in all its phases, and we are indebted to them for what we must regard as the most important work on Irish Natural History as a whole since the appearance of Thompson's "Natural History of Ireland."—G. E. H. B. H.

INDEX

Aberdeen, Botanic Garden in, 186
Acalla aspersana in Unst (Curr. Lit.), 59
Acherontia atropos in Renfrewshire, 118; in Orkney, 187
ADAIR, PETER, notes on the birds of Ettrick, 21
Additions to "British Conchology" (Curr. Lit.), 245
Agrostis pumila, L., 243
Ailsa Craig, old note on, 113
Algæ, new or critical British marine (Curr. Lit.), 61; of Lamlash Bay, Arran (Curr. Lit.), 61
Alucita hexadactyla in Scotland, 54
Ampelis garrulus in Ayrshire, 115; in Banffshire, 50; in Cairngorm district, 50; in Elginshire, 50; at Loch Lomond, 116; in Lothians, 116
Anas strepera in Moray, 117
ANDERSON, PETER, Wild Geese flying at a great height, 116; birds observed in the island of Tiree, 153
ARCHER, the late WILLIAM, F.R.S., 8
ARMSTRONG, ROBERT, the Pied Flycatcher, etc., in Nithsdale, 49
Auk, Little, in Moray, 53
Avifauna of West Ross-shire, contribution to, 65

BABINGTON, CHARLES CARDALE, Memorials, etc., of (Curr. Lit.), 126
Bacteria of the soil, with special reference to soil inoculation (Curr. Lit.), 60
Badger colony in Dalmeny Park (Curr. Lit.), 124; in Dumfriesshire (Curr. Lit.), 187; in Kirkcudbrightshire, 112
Barra, additions to the birds of the island of, 75
BENNETT, ARTHUR, F.L.S., records of Scottish plants for 1897, additional to Watson's "Topographical Botany," 225
Ben Nevis, additional Coleoptera from the summit of, 30; vertebrate and plant life on (Curr. Lit.), 58
Berwickshire *Rubi* and *Rosæ* (Curr. Lit.), 60
Bipalium kewense at Paisley (Curr. Lit.), 60
Birds of Ettrick, notes on, 21; of Carmichael, notes on, 47; of the island of Barra, additions to, 75; of Kintail, Ross-shire (Curr. Lit.), 124; observed in the island of Tiree, 153; report on movements and occurrence of in Scotland during 1897, 200
Blackcock and Capercaillie hybrid near Inverness, 52
Blysmus rufus, var. *bifolius* (Curr. Lit.), 126
BOLAM, GEORGE, F.Z.S., Red-footed Falcon in Scotland, 116
Boreus hiemalis in Midlothian, 55
Botanical and other notes [from Coldingham] (Curr. Lit.), 125
Botanists, biographical index of British and Irish (Curr. Lit.), 127, 188, 245
Botany, topographical, of Scotland, 39, 98, 164, 230
Botrychium matricariæfolium and *B. lanceolatum* in Britain (Curr. Lit.), 246
BROWN, HENRY H., *Pygæra bucephala* in Moray, 54; *Euchelia Jacobææ* and its food-plant, 54
BROWN, JAMES, Waxwing in Elginshire, 50; Leach's Petrel and Little Auk in Moray, 53
BUCKLEY, T. E., B. A., F.Z.S., hybrid Capercaillie and Blackcock near Inverness, 52; Gadwall in Moray, 117; Great Skua in Moray Firth, 118
Bunting, Ortolan, in Shetland, 178

Caddis flies, In search of, in 1897 (Curr. Lit.), 187
Cadzow herd of White Cattle, an obscure point in the history of the, 235
CAMPBELL, BRUCE, Goldfinch in West Lothian, 180
CAMPBELL, CHARLES, partial albinism in Robin at Dalmeny, 49; Cuckoo in captivity, 116
Cantire, notes from (Curr. Lit.), 246
Capercaillie and Blackcock hybrid near Inverness, 52
Capercaillie and Pheasant, hybrid between, 17, 117
Capercaillie in S.E. Lanarkshire, 118; introduction into Inverness-shire, 237
Caranx trachurus in the Solway, 53
Carduelis elegans in Caithness, 115; in Mid-Perth, 115; in West Lothian, 180
Carex chordorhiza, Ehrh., in Britain (Curr. Lit.), 61; *frigida*, the British (Curr. Lit.), 126; *helvola* on Ben Lawers (Curr. Lit.), 188; in Britain (Curr. Lit.), 246; *xanthocarpa*, Diseg., 243
Cephenomyia auribarbis, larvæ of, etc. (Curr. Lit.), 125
Cerastium, on primary characters in, 121, (Curr. Lit.) 126
Charr, peculiar, from Inverness-shire, 78
Chiff-chaff in Clyde area (Curr. Lit.), 58; in East Renfrewshire, 115
CHRISTIE, A. CRAIG, F.L.S., flora of Perthshire, 242
Cladodus Neilsoni (Curr. Lit.), 58
CLARKE, WM. EAGLE, hybrids between Capercaillie and Pheasant, 17, 117; Lesser Shrew in Tiree, 111; Hawfinch in Midlothian, 114; protection of Wild Birds and their eggs in Scotland, 146
Claytonia perfoliata, Don, 186
Climatic zones, Watson's (Curr. Lit.), 126
Club, excursion of the Scottish Alpine Botanical, to Clova (Curr. Lit.), 60
Coccothraustes vulgaris in Midlothian, 114
Coleoptera, additional, from the summit of Ben Nevis, 30; Ayrshire (Curr. Lit.), 59; from Hoy (Curr. Lit.), 59
Coll plants (Curr. Lit.), 61
Columba palumbus nesting in the City of Edinburgh, 183
Colymbus arcticus in East Renfrewshire, 115; *glacialis* at St. Abb's Head, 53
Copepods, apparently new, from Clyde (Curr. Lit.), 125
Corallorhiza innata, new locality for (Curr. Lit.), 126
Corophium affine in Loch Fyne, 240
CRAIG, ARCHIBALD, Ring Dove nesting in the City of Edinburgh, 183
Crambus perlellus, var. *rostellus*, in Ross-shire (Curr. Lit.), 59
Crows, hybrid, in Forth area, 186
Cuckoo in captivity, 116
Cuculus canorus in captivity, 116
Cyclops Dybowskii, 241; *languidus* in Loch Doon, Ayrshire, 184; *nanus* in Loch Doon, Ayrshire, 184
Cymochorea leucorrhoa in Moray, 53

Dafila acuta nesting in the "Forth" area, 162
DAVIDSON, JOHN, migratory Locust in Aberdeenshire, 55
Death's-head Hawk Moth in Renfrewshire, 118
Delphinus delphis in Moray Firth, 47
Dendrocopus major in Peeblesshire, 182
DEWAR, Dr. T. F., Red-backed Shrike in Forfarshire, 180
DEWAR, Drs. T. F. and W. J., Golden Oriole in Forfarshire, 179
Deyeuxia stricta, var. *borealis*, extinction of (Curr. Lit.), 61
Diaptomus hircus in Loch Lochy, Inverness-shire, 55
Diptera from Aberdeen (Curr. Lit.), 188
Diver, Black-throated, in East Renfrewshire, 115; Great Northern, at St. Abb's Head, 53
Divers, Great Northern and Black-throated, nesting in Shetland (Curr. Lit.), 58
DOBBIE, J. B., F.R.S.E., F.Z.S., a contribution to the avifauna of West Ross-shire, 65; curious nesting site of Marsh Titmouse, 180; Viper in the Pentlands, 184
Dolphin, Bottle-nosed, in Moray Firth, 47; White-beaked, in the Moray Firth, 112, 177
Dolphins in the Moray Firth, 177
Dove, Ring, nesting in the City of Edinburgh, 183
DRUCE, G. CLARIDGE, M.A., F.L.S., plants of West Ross, 122; *Rosa dumetorum*, Thuill., 122; *Poa cenisia*, All., var. *flexuosa* (Wahl.), a new species of Grass in Scotland, 122; the "Flora of Perthshire," 242; *Carex xanthocarpa*, Diseg., 243; *Agrostis pumila*, L., 243
Duck, Long-tailed, in Dumfriesshire, 52; in Kirkcudbrightshire, 52

Duck, Tufted, early hatching of, in Caithness, 184
Dulichia monocantha in the Clyde, 55
Dytiscus lapponicus in Mull (Curr. Lit.), 59

Eagle, Golden, capture of a (Curr. Lit.), 243
Edinburgh, Mosses and Hepatics near, 186
Elf Loch, Braids, fauna of (Curr. Lit.), 124
Emberiza hortulana in Shetland, 178
Epione parallelaria in Scotland (Curr. Lit.), 125; *vespertaria* in Roxburghshire (Curr. Lit.), 59
Erithacus rubecula, partial albinism in, 49
Ettrick, notes on the birds of, 21
Eucalanus crassus, recurrence of, in the Moray Firth, 119
Euchelia Jacobææ and its food-plant, 54
Euphrasiæ, Scottish, 57; monograph of British species (Curr. Lit.), 60
Euphrasia foulaensis, Scottish localities for (Curr. Lit.), 188; *latifolia*, Pursh., in Caithness (Curr. Lit.), 246
EVANS, HENRY, the Great Shearwater at St. Kilda, 238
EVANS, WILLIAM, F.R.S.E., Harvest Mouse in Moray, 46; *Boreus hiemalis* in Midlothian, 55; *Meta menardi* in Kirkcudbrightshire, 55; Goldfinch in Mid-Perth, 115; Waxwing in Lothians, 116; Pintail nesting in the "Forth" area, 162; records of Scottish land and freshwater Mollusca, 185; Blue Shark in the Firth of Forth, 239; *Meta menardi* on Ailsa Craig, 239; *Sirex gigas* in Argyleshire, 240
Excresences and diseases occasioned in plants by mites (Curr. Lit.), 129

Falco islandus in Shetland, 182; *tinnunculus* in Aberdeenshire, 51; *vespertinus* in Scotland, 116
Falcon, Iceland, in Shetland, 182; Red-footed, in Scotland, 116
Faunal areas, minor, 8
Fieldfares, late, in Midlothian, 178
Flora, a new British, 124
Flora of Tiree, 31
Flowers, colours of, and moisture, 243
Flycatcher, Pied, in Shetland, 178
Forth, Pelagic Invertebrate Fauna of the Firth of (Curr. Lit.), 244
Fossils, Cretaceous, found at Moreseat, Aberdeenshire, 125
FOWLER, J. A., Rose-coloured Pastor in West Ross-shire, 49
Fuligula cristata, early hatching of, in Caithness, 183; *ferina* breeding in Wigtownshire, 51; *marila* in inland waters, 51
Fungi, new or rare British (Curr. Lit.), 188
Fyne, invertebrate fauna of Loch (Curr. Lit.), 245

Gadwall in Moray, 117
Gallinula chloropus, mode of progression of young, 183
Galloway, botanical notes from, for 1896 (Curr. Lit.), 61
"Garland," trawling experiments of the (Curr. Lit.), 244
Garrulus glandarius, in Berwickshire, 48; in Dumfriesshire, 49, 181; in East Lothian, 48; in Scotland, 114
Gatty Marine Laboratory, St. Andrews, notes from the (Curr. Lit.), 245
Geese, Wild, flying at a great height, 116
Gelechia confinis, Stn., a Northern form of *G. similis*, Stn. (Curr. Lit.), 244
Germon in the Solway Firth, 53
GIBSON, Rev. J. D. W., notes on the birds of Carmichael, 47
Glasgow Natural History Society, Proceedings (Curr. Lit.), 61
Globiocephalus melas in Moray Firth, 177
GODFREY, ROBERT, M.A., Jay in East Lothian, 48; Goldfinch in Caithness, 115; late stay of Fieldfares in Midlothian, 178; hybrid Crows in Forth area, 181; mode of progression of young Waterhen, 183; early hatching of Tufted Duck in Caithness, 183; Pochard in Midlothian, 238
Golden Oriole in Forfarshire, 179
Goldfinch in Caithness, 115; in Mid-Perth, 115; in West Lothian, 180
Grampus in Clyde, 236
Grebe, Great Crested, breeding in Wigtownshire, 51
GRIMSHAW, PERCY H., F.E.S., note on the life-history of *Lochmæa suturalis*, 27
Gull, a habit of the Black-headed, 237
Gull, Ivory, on the Solway (Curr. Lit.), 244; Sabine's, in Arran, 52
Gymnadenia conopsea × *albida* in Scotland (Curr. Lit.), 246

Halichœrus grypus, note on female, from Sutherland, 177
Harelda glacialis in Dumfriesshire, 52; in Kirkcudbrightshire, 52

Harrier, Marsh, in Dumfriesshire, 182
Harvest Mouse in Moray, 47 ; in Renfrewshire, 112
Harvie-Brown, J.A., F.R.S.E., F.Z.S., on the minor faunal areas, 8; Capercaillie in S.E. Lanarkshire, 118
Hawfinch in Midlothian, 114
Henderson, Thomas, Jun., remarkable visitation of migratory birds to Shetland, 178
Hepaticæ, new and rare Scottish (Curr. Lit.), 246
Hieracia, British, 57
Homalomyia scalaris feeding on wax, 241
Hoopoe at the Isle of May, 182
Hybrids between Capercaillie and Pheasant, 17, 117
Hybrid Capercaillie and Black Cock near Inverness, 52
Hybrid Crows in Forth area, 181
Hydroptilidæ, new, from Scotland, 187
Hyperoodon rostrata in the Moray Firth, 113

Inland waters of Scotland, invertebrate fauna of (Curr. Lit.), 245
Irby, Lieut.-Col. L. Howard, F.L.S., Long-eared Owl in the Outer Hebrides, 50
Isias clavipes, recurrence of, in the Firth of Clyde, 120
Isopods, notes on some Scottish marine, 218
Iynx torquilla in Foula, 182

Jay in Berwickshire, 48 ; in Dumfriesshire, 49, 181 ; in East Lothian, 48
Jays in Scotland, 114

Kestrel, Lesser, in Aberdeenshire, 51
Kidston, R., F.R.S.E., and J. S. Stirling, Moss new to Britain, 243
Kinnear, Norman B., Badger in Kirkcudbrightshire, 112
Kirk, Charles, Water Rail breeding near Glasgow, 52 ; Great Northern Diver at St. Abb's Head, 53

Labidocera wollastoni, recurrence of, in the Firth of Clyde, 120
Lagenorhynchus albirostris in the Moray Firth, 112, 177
Laidlaw, T. G., Great Spotted Woodpecker in Peeblesshire, 182 ; report on movements and occurrence of birds in Scotland during 1897, 200
Lanius collurio in Forfarshire, 180
Lepidoptera from Orkney, variation in (Curr. Lit.), 124
Lepidoptera, notes on, 1897 (Curr. Lit.), 187 ; captured in the Orkney Islands (Curr. Lit.), 244
Lepidopus caudatus, 53
Liddesdale district of Roxburghshire, plants indigenous to (Curr. Lit.), 125
Lochmæa suturalis, note on life-history of, 27
Locust, migratory, in Aberdeenshire, 55
Lonicera caprifolium in Perthshire (Curr. Lit.), 246
Lumsden, James, Waxwings at Loch Lomond, 116 ; Shelduck carrying its young, 117
Lycium barbarum and *L. europæum* and their local culture (Curr. Lit.), 126

Macdonald, A., colours of flowers and moisture, 243
Macpherson, Rev. H. A., M.A., F.Z.S., Long-tailed Duck in Dumfriesshire, 52 ; Germon in the Solway Firth, 53 ; Scad in the Solway, 53
MacRury, John, M.B., the birds of the island of Barra—additions and notes, 75
Macvicar, Symers M., on the flora of Tiree, 31, 81
Man, early, in Scotland, 129, 193
Marshall, Rev. Edward S., M.A., F.L.S., *Ranunculus petiolaris*, 122
Mastigophora Woodsii in Inverness-shire (Curr. Lit.), 127
Maxwell, Sir Herbert, Bart., F.L.S., Scaup in inland waters, 51 ; Jays in Scotland, 114
Meles taxus in Kirkcudbrightshire, 112
Mergulus alle in Moray, 53
Meta menardi in Kirkcudbrightshire, 55 ; on Ailsa Craig, 239
Mollusca, land and freshwater, records of Scottish, 185
Morice, Rev. F. D., M.A., F.E.S., further notes on Saw-Flies (*Tenthredinidæ*) from the summit of Ben Nevis, including a species new to Britain, 80
Moss new to Britain, 243
Mosses, distribution of British, 121, (Curr. Lit.) 126
Motacilla flava in Lanarkshire, 179
Mus minutus in Moray, 46, 47 ; in Renfrewshire, 112
Muscicapa atricapilla in Nithsdale, 49 ; in Shetland, 178
Mycology of Kelvingrove Park (Curr. Lit.), 61

Nemeophila plantaginis, ab. *hospita* and ab. *rufa* (Curr. Lit.), 59; black aberration, 59
Nitragin, experiments with (Curr. Lit.), 60
NOBLE, HEATLEY, introduction of the Capercaillie into Inverness-shire, 237
Notes of the season—Wigtownshire (Curr. Lit.), 244

Obituary Notices.—MORRIS YOUNG, F.E.S., 1; GEORGE WILLIAM TRAILL, 7; WILLIAM ARCHER, F.R.S., 8
Œstrine parasites of British deer (Curr. Lit.), 125
Oporabia autumnata (Curr. Lit.), 187
Orcanus germo in the Solway Firth, 53
Oriolus galbula in Forfarshire, 179
Orsodacna, colour-varieties in Britain (Curr. Lit.), 244
Ospreys, destruction of, 182
Otters, White (Curr. Lit.), 124
Otus vulgaris in Outer Hebrides, 50
Owl, Barn, dark form of, in Kincardineshire, 50; Long-eared, in Outer Hebrides, 50
Oxycera dives at Rannoch (Curr. Lit.), 188

Pachytylus migratorius in Aberdeenshire, 55
Paracalanus parvus in the Firth of Clyde, 120
Paramunna bilobata in Loch Fyne, 56
Parus palustris, curious nesting site of, 180
Pastor roseus in West Ross-shire, 49
PATERSON, JOHN, Sabine's Gull in Arran, 52; old note on Ailsa Craig, 113; Garden Warbler south of the Grampians, 114; Waxwing in Ayrshire, 115; Blue-headed Wagtail in Lanarkshire, 179; an obscure point in the history of the Cadzow herd of white cattle, 235; the Grampus in Clyde, 236
PATERSON, JOHN, and ROBERTSON, JOHN, Chiff-chaff, Wood Wren, and Black-throated Diver in East Renfrewshire, 115
Pelias berus in the Pentlands, 184
Perthshire, "Flora" of, 242
Perthshire note, a (Curr. Lit.), 246
Petrel, Leach's, in Moray, 53
Phasianus colchicus and *Tetrao urogallus*, hybrids between, 17, 117
Pheasant and Capercaillie, hybrids between, 17, 117
Phylloscopus rufus in East Renfrewshire, 115; *sibilatrix* in East Renfrewshire, 115
Pied Flycatcher in Nithsdale, 49
Pintail nesting in the "Forth" area, 162
Plagiothecium Müllerianum in Britain (Curr. Lit.), 246
Plant Plankton, observations on (Curr. Lit.), 61
Plants, nitrogenous food of (Curr. Lit.), 60
Plants, records of Scottish, for 1897, 225
Poa cenisia, All., var. *flexuosa* (Wahl.), a new species of grass in Scotland, 122
Pochard breeding in Wigtownshire, 51
Pochard in Midlothian, 238
Podicipes cristatus breeding in Wigtownshire, 51
Polecat in Elginshire, 236
Polyommatus astrarche ab. *quadripuncta* (Curr. Lit.), 58
Pratincola rubetra in Shetland, 178
Protection of wild birds and their eggs in Scotland, 146
Psychoda albipennis from Loch Maree (Curr. Lit.), 188; *phalænoides* from Loch Maree (Curr. Lit.), 188
Pygæra bucephala in Moray, 54
Pyrus Aria and its varieties (Curr. Lit.), 60

Rallus aquaticus breeding near Glasgow, 52
Ranunculus auricomus, note on (Curr. Lit.), 60; *petiolaris*, 122, (Curr. Lit.), 126
REID, WILLIAM, F.E.S., *Tæniocampa gracilis* in Scotland, 119
Reviews—
Manual of British Birds, by Howard Saunders, 62
A History of Fowling, by the Rev. H. A. Macpherson, 62
With Nature and a Camera, by R. Kearton, 63
Memories of the Months, by Sir Herbert Maxwell, 63
Among British Birds in their Nesting Haunts, by O. A. J. Lee, 64
A Handy Guide to Fish Culture, by J. J. Armstead, 64
Wild Birds Protection Acts, 1880-96, by J. R. V. Marchant, M.A., and Watkin Watkins, B.A., Barristers-at-Law, 127
A Sketch of the Natural History (Vertebrates) of the British Islands, by F. G. Aflalo, F.R.G.S., F.Z.S., 128
Audubon and his Journals—Maria R. Audubon. With Zoological

Reviews—
and other Notes by Elliot Coues, 189
Flora of Perthshire — Francis Buchanan W. White, M.D., F.L.S., F.E.S. Edited, with an Introduction and Life of the Author, a list of his Scientific Publications, and an Appendix, by James W. H. Trail, A.M., M.D., F.R.S., 190
Synopsis Characearum Europæarum, —Dr. Walter Migula, 191
County and Vice-County Divisions of the British Islands, 191
Coloured Figures of the Birds of the British Islands, issued by Lord Lilford, F.Z.S., 193
Life and Letters of Alexander Goodman More, F.R.S.E., F.L.S., M.R.I.A., edited by G. B. Moffat, B.A., 247
Roach in the Solway district, spread of, 239
Robertson, David, LL.D., In Memoriam (Curr. Lit.), 58
Robin, partial albinism in, at Dalmeny, 49
Rorqual, Lesser, in the Moray Firth, 236
Rosa dumetorum, Thuill, 122
Rose-coloured Pastor in West Ross-shire, 49
Ross, plants of West, 122
Ross-shire, West, contributions to avifauna of, 65

Salices, experiments in cross-fertilisation of (Curr. Lit.), 188
Salmo alpinus, peculiar, in Inverness-shire, 78
Saw-Flies from the summit of Ben Nevis, including a species new to Britain, 80
Scabbard Fish in Scottish waters, 53
Scad in the Solway, 53
Scaup in inland waters, 51
Scoters in summer (Curr. Lit.), 244
Scott, Thomas, F.L.S., *Diaptomus hircus* in Loch Lochy, Inverness-shire, 55; *Dulichia monocantha* in the Clyde, 55; occurrence of *Paramunna bilobata*, 56; recurrence of *Eucalanus crassus* in the Firth of Clyde, 119; recurrence of *Labidocera wollastoni* and *Isias clavipes* in the Firth of Clyde, 120; *Paracalanus parvus* in the Firth of Clyde, 120; *Cyclops nanus* and *C. languidus* in Loch Doon, Ayrshire, 184; notes on some Scottish marine Isopods, 218; on the occurrence of *Corophium affine* in Loch Fyne, 240; *Cyclops Dybowskii*, 241; *Streblocerus minutus* in the Dhu Loch, near Rowardennan, Loch Lomond, 241
Seal, Gray, note on female, from Sutherland, 177
Sedges, British, 122; notes on some British (Curr. Lit.), 126
Sericomyia borealis, habits of (Curr. Lit.), 59
Serle, William, migrant Wagtails at Peterhead, 237; a habit of the Black-headed Gull, 237
Service, Robert, Jay in Dumfriesshire, 49, 181; Long-tailed Duck in Kirkcudbrightshire, 52; Marsh Harrier in Dumfriesshire, 182; uncommon fishes in the Solway Firth, 239; spread of the Roach in the Solway district, 239; noxious insects in the Solway district, 240; *Homalomyia scalaris* feeding on wax, 241
Shark, Blue, in the Firth of Forth, 239
Shearwater, Great, at St. Kilda, 238
Shelduck carrying its young, 117
Shetland, remarkable visitation of migratory birds to, 178; Whinchat, Ortolan Bunting, and Pied Fly-catcher in, 178
Shrew, Lesser, in Tiree, 111
Shrike, Red-backed, in Forfarshire, 180
Sim, George, A.L.S., Harvest Mouse in Moray, 46; dark form of Barn Owl in Kincardineshire, 50; Lesser Kestrel in Aberdeenshire, 51; Scabbard Fish in Scottish Waters, 53
Simpson James, note on female Gray Seal obtained on the east coast of Sutherland, 177
Sirex gigas in Argyleshire, 240
Siskin in Kirkcudbright, 180
Skua, Great, in Moray Firth, 118
Small, Robert, Waxwing in Cairngorm district, 50; Hoopoe at the Isle of May, 182
Solway district, noxious insects in the, 240
Solway Firth, uncommon fishes in the, 239
Sorex minutus in Tiree, 111
Sphinx convolvuli in Scotland (Curr. Lit.), 58
St. Abb's and vicinity, plants found in June 1896 (Curr. Lit.), 125
St. Kilda, Great Shearwater at, 238
St. Kilda Wren, the so-called (Curr. Lit.), 244
Steele, A. B., *Claytonia perfoliata*,

Don, 186; Mosses and Hepatics near Edinburgh, 186
Stercorarius catarrhactes in Moray Firth, 118
STIRLING, J. S., and R. KIDSTON, F.R.S.E., Moss new to Britain, 243
Streblocerus minutus in the Dhu Loch, near Rowardennan, Loch Lomond, 241
Strix flammea, dark form of, in Kincardineshire, 50
STUART, CHARLES, M.D., Jay in Berwickshire, 48
Sunaristes paguri, notes on (Curr. Lit.), 59
Sylvia hortensis south of the Grampians, 114

Tadorna cornuta carrying its young, 117
Tæniocampa gracilis in Scotland, 119
TAYLOR, J. M. B., Harvest Mouse in Renfrewshire, 112; *Acherontia atropos* in Renfrewshire, 118
TAYLOR, WILLIAM, Common or Bottle-nosed Dolphins in the Moray Firth, 47; White-beaked Dolphin in the Moray Firth, 112; *Hyperoodon rostrata* in the Moray Firth, 113; Dolphins in the Moray Firth, 177; Polecat in Elginshire, 236; Lesser Rorqual in the Moray Firth, 236
Tenthredinidæ from the summit of Ben Nevis, including a species new to Britain, 80
Tephrosia bistortata in Scotland (Curr. Lit.), 59
Tetrao urogallus in S.E. Lanarkshire, 118
Tetrao urogallus and *Phasianus colchicus*, hybrids between, 17, 117
THORNLEY, Rev. A., M.A., F.L.S., F.E.S., additional Coleoptera from the summit of Ben Nevis, collected by Mr. W. S. Bruce in 1896, 30
Tiree, birds observed in, 153; flora of, 31, 81; plants (Curr. Lit.), 61
Titmouse, Marsh, curious nesting site of, 180
Topographical botany of Scotland, 39, 98, 164, 230
Tour in N. Scotland, notes on a (Curr. Lit.), 188
TRAIL, JAMES W. H., A.M., M.D., F.R.S., topographical botany of Scotland, 39, 98, 164, 230
TRAILL, the late GEORGE WILLIAM, 7
TRAILL, Mrs. A. L., Wryneck at the island of Foula, Shetland, 182
TRAQUAIR, R. H., M.D., LL.D., F.R.S., etc., on a peculiar Charr from Inverness-shire, 78
Turdus pilaris, late, in Midlothian, 178
TURNER, Sir WILLIAM, D.C.L., LL.D., F.R.S., Early Man in Scotland, 129, 193
Tursiops tursio in Moray Firth, 47
TUTT, J. W., F.E.S., *Alucita hexadactyla* in Scotland, 54

Upupa epops at the Isle of May, 182

Venilia macularia in Scotland (Curr. Lit.), 125
Viola tricolor and its allies, 56
Viper in the Pentlands, 184

Wagtail, Blue-headed, in Lanarkshire, 179
Wagtails, migrant, at Peterhead, 237
Warbler, Garden, south of the Grampians, 114; Wood, in East Renfrewshire, 115
Waterhen, mode of progression of young, 183
Water Rail breeding near Glasgow 52
Waxwing in the Cairngorm district, 50; in Elginshire, 50; in Ayrshire, 115; in Lothians, 116
Waxwings in Banffshire, 50; at Loch Lomond, 116
Whale, Bottle-nosed, in the Moray Firth, 113; Pilot, in Moray Firth, 177
Whinchat in Shetland, 178
Wild Birds Protection Act, prosecution under the, 237
Willow hybrids, some Scotch (Curr. Lit.), 60
Willows, set of British, 122
Woodpecker, Great Spotted, in Peebles-shire, 182
Wryneck in Foula, 182

Xema sabinii in Arran, 52

YOUNG, MORRIS, the late, 1

END OF VOL. VII.

Printed by R. & R. CLARK, LIMITED, *Edinburgh*

WH 1AWQ W