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HISTORY OF THE CARLISLE NATURAL HISTORY SOCIETY

BY FRANK H. DAY, F.R.E.S.

(*Read December 12th, 1929, Revised April 24th, 1933*).

Nearly 40 years having now elapsed since this Society came into existence, the publication of the present volume of Transactions may be considered an opportune time to give some account of its history.

The "Entomologist" for January, 1894, page 24, contained the following notice :—

"A NEW LOCAL ENTOMOLOGICAL SOCIETY.

A number of entomologists met at the house of Mr. Eales, on November 30th (1893), and formed the Carlisle Entomological Society. Twelve members were enrolled, officers were chosen, and a number of rules were made. Mr. Christopher Eales was elected President, and Mr. John Buckle Secretary and Treasurer. The meetings are being held at the house of Mr. Eales for the present. We will forward the reports of the meetings each month."—John Buckle, Secretary.

To this report the Editor of the "Entomologist," Mr. Richard South, added the footnote :—"We have very great pleasure in publishing the above announcement, and wish the newly-formed Society every success."

The circumstances which led to the formation of the Society were something like this. In the years 1892 and 1893, the above-named John Buckle, George and John Wilkinson, and the present writer, had taken up the study of Butterflies and Moths, and had done a fair amount of collecting in the fields, lanes and woods around Carlisle. There was also a man named Gilbertson, of

twice our age (we were only boys) who had been collecting for many years, and who gave us a good deal of information about where to go and what to do. He had a very fair collection of locally-taken insects, which, however, were not kept in very good order. This man sprang from a class of collector, at one time numerous in the North of England, whose interests in the field were largely centred in such showy species as Red Admirals, Tortoiseshells, Peacocks, Emperors, and what they called "Fleckellaries" and "Oskalaters!" These they collected in large numbers, arranging them in wall cases in the design of a crown or a star. They were known as "picture men." Gilbertson, however, would have nothing to do with this way of collecting, and what work he did was on more sensible lines. At any rate he kept his specimens in boxes from which the light was excluded, arranged and classified with the aid of Kirby's "European Butterflies and Moths," of which he possessed a well-thumbed copy, and which was in fact his only book. Unfortunately he knew nothing of the virtues of camphor or naphthaline, and in consequence his collection of *Acari* was nearly as numerous as his *Lepidoptera*!

It was through Gilbertson that we got in touch with Christopher Eales, then a man nearing 70 years of age. He was a joiner by trade, and I had known him in business for some time, but had no idea he was a lepidopterist. He invited Buckle and I to see his collection, and we spent a most instructive Saturday afternoon at his house. His collection was arranged in about 25 cabinet drawers, and at that time was in fairly fresh condition, very neatly arranged, and, after Gilbertson's collection, was a revelation to us.

Eales was not a Carlisle man. He came from Darlington, and much of his field work had been done in Co. Durham. He was one of the first collectors to take the Wainscot moth, *Tapinostola elymi*, on that coast, which he sent out freely in exchange to collectors in other parts of the country. He was also keen on the Tineae, Tortrices, and other groups of the so-called Microlepidoptera. A favourite collecting ground locally with him was Kingmoor, where he found several interesting species.

Unfortunately, however, like a good many "old collectors," he did not label his captures, and although his collection subsequently was very useful for identification purposes, much of its interest from a scientific point of view was lost. But he had many good points. He was a strong advocate of the pursuit of entomology with the definite object of adding something to biological knowledge. The study of the life history of an insect he considered more important than the possession of a large collection, and he was very scathing in his strictures on collectors who made that their only objective. When he saw that we were really keen on insects, he said "Why not form a Society among yourselves?" It was that suggestion which started the "Carlisle Natural History Society" into life.

The first meeting was held in his house, as reported in the notice in the "Entomologist," quoted at the beginning of this article. A fortnight later some half-dozen of us were again at Eales' house for our second meeting, but unfortunately our Mentor was indisposed, and the meeting could not take place, nor did we again meet under his auspices. Failing health and age were beginning to affect him, and for lack of a leader, the young Society began to languish, and seemed likely to expire. But that was not to be. I do not remember exactly how it happened, but the Rev. H. A. Macpherson, the eminent ornithologist, heard of our enthusiasms and aspirations, and invited us to his house, in Victoria Place, to talk things over. Although no entomologist himself, Mr. Macpherson was a naturalist with a deep interest in work in branches of Natural History other than his own, and the result of the little conference was entirely satisfactory.

Tullie House had been recently acquired by the Carlisle Corporation, and the work of extending it and establishing a Public Library, Art Gallery, and Museum, was nearing completion. Mr. Macpherson said: "Hold your meetings with me, and we will see if a room can be arranged for at the Museum later." Accordingly a number of meetings, more or less informal, were held in his house. A Minutes book was kept by the Secretary, but there are records of two meetings only at this stage of the Society's

career. The first meeting was on February 1st, 1894, when Mr. Macpherson was asked to be our President, to which he consented. Mr. Tom Duckworth was appointed Vice-President. A number of rules were drawn up which were the basis of the rules of later years. Three members exhibited lepidoptera, and the meeting was made particularly interesting by the presence of Mr. Charles G. Barrett, a leading British lepidopterist, who gave us some useful advice as well as an account of the introduction into Britain of *Ephestia kuhniella*, which had recently made its appearance in Carlisle factories and mills, and was doing considerable damage to stores of flour, etc. Several local bird lovers were present at this meeting, and it was decided to widen the Society's interests, and welcome all students of nature. The name of the Society was accordingly changed to "The Carlisle Entomological and Natural History Society."

The minutes of the second meeting in Mr. Macpherson's house were noteworthy as reporting the reading of the first paper before the Society. This was by George Wilkinson, then about 16 years of age, and was entitled "The Butterflies of the District." The list included the names of 24 species, one being *Vanessa antiopa*, a specimen of which had lately been taken near Carlisle.

It was at this meeting that our President announced that the Tullie House Committee was willing to allow the Society the use of a room in the Museum in which to hold its meetings, and accordingly the third meeting of which we have a record in the Minutes Book, was held there on March 1st, 1894, now nearly 40 years ago, where we have been in residence, so to speak, ever since.

At this meeting Tom Duckworth was present. An observer rather than a collector, he had much all-round knowledge of local Natural History, and the Society looked to him for help and advice in the days to come. But it was not to be, as before our fourth meeting, on March 22nd, 1894, he had met with the accident which ended his life. He had charge of the dynamos and electric lighting arrangements in Tullie House, and the fatality happened in the course of his work.

The membership of the Society was now beginning to show signs of increase. The minutes of this period record the election of new members at every meeting, but do not mention names. I think, however, it was at this fourth meeting that Mr. B. Johnston became a member of the Society, and commenced an active connection with its affairs, which only ended on his death on March 5th, 1933.

Our President, Mr. Macpherson, spared no effort to further the Society's interests. At the meetings he was always full of information about birds, and did all he could to encourage the entomological section, consisting entirely of youths and young men. Through his efforts the collection of our old friend, Christopher Eales, was acquired for the Museum, and given into the charge of the entomologists, to whom it was most useful for the purposes of identification.

The Society was now firmly established. The widening of its interests to include all branches of Natural History had done much to increase the membership, and the meetings were well attended. Throughout 1894 the meetings were held fortnightly, and exhibits of birds, eggs, shells, butterflies and moths were frequent. Field observations, and records of captures were made at every meeting; while papers on such subjects as "Notes on the Season," "Migration," "Mimicry," &c., were read by various members. These records and papers often came in for protracted discussions, some of the opinions expressed, in the light of later knowledge and wider experience, seem rather amusing to-day. In 1894 also the Society began to have field-meetings, and had outings to Orton, Silloth and Rose Castle.

The first annual meeting was held on December 11th, of that year, when we had a new President, Mr. E. C. Stowell, a botanist, with Mr. Macpherson and Mr. B. Johnston as Vice-Presidents, and the present writer Hon. Secretary and Treasurer.

It was at this meeting that the Badger, at that time very rare in Cumberland, and almost on the verge of extinction, was noted as re-establishing itself in our area, and as events turned out, it has been quite successful.

During 1895 the meetings continued to be held once a fortnight until April, then until September they were monthly ; after which they were fortnightly again right through the winter. In all 18 meetings were held in 1895, and reading through the minutes of same to-day, they appear to have been exceptionally interesting. The ornithological members were very active, the protracted winter^d of 1894-95 being responsible for many unusual observations on bird life. Following the severe winter came an early spring and a glorious summer, with an abundance of insect life, which provided ample scope to the lepidopterists for the prosecution of their field work, and many good species were taken. As a result of the hot summer insects normally single-brooded were double-brooded ; while other species usually looked upon as scarce occurred freely. " Sugar " was remarkably productive, more so than the members at that time had known it. This abundance of lepidoptera was reflected in the exhibits of captures at the meetings, which provided material for much interesting discussion. A number of papers were read during the year on a variety of subjects.

The second annual meeting was held on November 5th, 1895, when Mr. Macpherson became President again, with Mr. B. Johnston and Mr. James Murray, Vice-Presidents. 1896 was again a busy year. The meetings continued to be well attended, and, if anything, the exhibits were more numerous than ever. Nineteen meetings were held in this year. The minutes show that the interests of the members were extending as there are frequent references to Dragonflies, Beetles, Bees, Spiders, Mosses, &c. A fertile subject for discussion about this time was the Viper. Altogether a good many hours were spent in discussing some of the debateable points in its ways of life. Living larvæ of lepidoptera were often shown, and some interesting series of the smaller moths were added to the Museum collection. A paper, read on February 18th, 1896, dealt with 70 species of Tortrices captured in the neighbourhood of Carlisle. There were some interesting papers on birds too, on such subjects as " The Crow Family," " The Swallow Family," " Observations in Spain," and so on.

In addition to the ordinary meetings, it was the habit of certain of the members in the winter months to meet in the Bird Room in the Museum to inspect and discuss the latest additions to the growing collections. The Museum was now developing rapidly under the guiding hand of Mr. Macpherson, the Hon. Curator, who spared no pains to get together a representative collection of birds. Mr. Hope had not yet joined the permanent staff, but he was frequently in the Museum preparing and arranging the exhibits in their cases. Before the Institution was opened he had a room elsewhere in Carlisle where he did much preliminary work.

A considerable amount of entomological material, mostly exotic, had been transferred from the Finkle Street Museum to Tullie House, and this, although unnamed, was at the time of much interest to some of the members, who took in hand the arrangement and display of numerous cases of exhibits. On wet Saturday afternoons it became a habit of these members to go to the Museum and engage in this congenial work, thereby helping to establish that relationship between the Museum and the Society, which has always been maintained, to the mutual advantage of both.

At a meeting on September 29th, 1896, the suggestion was made that the Society should publish Transactions, giving some record of its work, but although a most reasonable estimate was obtained for printing a 40 page pamphlet, the Society's finances would not allow the venture, and the project had to be abandoned for the time being. Thirteen years later, however, the Society achieved its ambition, and brought out its first volume.

1897 was again a busy year with 19 meetings; the Officers remaining as before. In this year Mr. G. B. Routledge became a member of the Society, and has been in the closest association ever since. The Society had now arranged the conduct of its meetings so as to allow as much opportunity as possible to deal with the business to be transacted, but in spite of this, the exhibits and records were so numerous, and the subsequent discussions so prolonged, that closing time sometimes arrived

before we were finished. It may be remarked that the minutes of the meetings of this period are the longest in the Society's annals.

Having said so much on the early history and establishment of the Society, it will be only necessary now to lightly skim over the next few years. In 1898 we had our first printed syllabus. It contained papers on "The Butterflies of Cumberland," by G. B. Routledge; "Prehistoric Man," by James Murray; "The Winter Visitors to Burgh Marsh," by M. C. Dixon, and various others. On January 17th of that year, we had our first "Special Exhibition," quite a successful venture, the description of which occupies five pages of the Minutes book. The meetings were now discontinued in the summer months, being resumed in September, when the entomologists had a great deal to report and exhibit. Ornithology now seemed to have fallen off as one of the Society's dominant interests. Although Mr. Macpherson was still President, he no longer lived in Carlisle, and, in consequence, could not attend the meetings, the effect of which was unfavourable to the Society.

In 1899, our work was largely entomological. The "Special Exhibition," in January, was a good one, but only insects and shells were shown. During this year the Society passed into a period of depression for the first time in its career. After the first burst of enthusiasm a sort of reaction set in, but in spite of this about six members kept things more or less alive in the hope that the phase would pass.

The year 1900 was again almost entirely concerned with entomology. Mr. Routledge was President, and remained so for three years. Steady work was done in the field in acquiring knowledge of insects of the more obscure Orders, and notes of discoveries were exchanged by the members. Careful records were being kept of all Cumberland insects, and a full account of what was known about them to the end of 1900 was published in the *Victoria History of the County*. That contribution appeared under the present writer's name, but much of the information given was due to the researches of his fellow entomological members of the Society, who kindly placed their

records at his disposal. When that publication appeared, it was made the basis of our further work. We always kept before us the hope of one day seeing the Society in a position to publish its own records of its work.

In 1900 only nine meetings were held ; in 1901 the number dropped to five, but in spite of these depressing conditions we went steadily on with our field-work. At the end of 1901 Mr. Macpherson died, and the Society suffered a severe loss. It was largely owing to his encouragement and help seven years previously that it was saved from collapse. In 1901, however, Mr. L. E. Hope became Curator of the Museum, and took up his residence in Carlisle. He had been a member for some time, but was now able to attend the meetings, and take an active part in the Society's affairs. His influence was soon apparent. Members interested in birds resumed their regular attendance at the meetings. A good many new members were elected about this time, some, however, with only a passing interest in Natural History. Still, things were improving, and the Society entered upon a period of general rather than special activity.

At the annual meeting in 1902, Mr. Hope became President, with Mr. G. B. Routledge and Mr. B. Johnston, Vice-Presidents. The following year Mr. D. Losh Thorpe, always a helpful friend, was President ; while Mr. Hope undertook the duties of Secretary, thus allowing the present writer a rest from the duties of that office for a period of three years, but in 1904 he served as President. In 1905 Mr. B. Johnston had his first term in the Presidential chair, and in 1906 Mr. James Murray, a member with varied interests in Natural History, served, followed, in 1907, by Mr. Harold Carr, a keen bird-lover and generous supporter of the Society.

A syllabus of the fixtures for each session was now being regularly printed and circulated among the members. The meetings in the summer months (except field excursions) had been definitely given up, but at the winter meetings there was always a paper, lecture, or something fixed beforehand to engage the interest of members. It was in 1902 that Mr. H. Britten

became associated with the Society, and for a number of years, until his removal from Cumberland, was among the most active of our field-workers, and made many important discoveries in the Fauna of the County. Two papers from his pen have appeared in earlier volumes of these Transactions, one on "The Mammals of the Eden Valley," the other on "The Spiders of Cumberland." Incidentally it may be here mentioned that the collection of spiders upon which the latter paper was based was subsequently presented to the Museum, where it is available to students of this branch of Natural History.

In the session 1903-04, thanks to the kindness of Mr. Routledge, who provided the slides, etc., a number of lantern lectures were given to members only, but in several subsequent sessions, in collaboration with the Tullie House Committee, these lantern lectures were continued, and thrown open to the general public, in the hope of stimulating interest in the Museum and the Society, but the results were not very encouraging. While there was no doubt that these lectures, judging by the number who attended them, were appreciated by the public, the interest excited was of a transient nature, as few new members were attracted, and finally, we had to conclude that the results of our attempts to popularise Natural History did not justify the trouble and expense of their preparation.

In 1908, the Rev. Canon Bower, although no naturalist, was President, and the Society's affairs progressed in a fairly satisfactory way. Expenses were small, and the income from members' subscriptions was slowly accumulating. The desire to publish some record of our work again began to exercise our thoughts. Mr. Hope's influence as Museum Curator was the means of enabling the Society to attain its desires, and several friends and patrons gave us the necessary financial help in response to his appeal. The first volume of the Society's Transactions appeared in 1909, and was most favourably received, not only locally, but by naturalists throughout the country. Printing at that time was cheap, and the Society was able to sell the surplus copies at a low price (2/3 each) with the result that the issue in a few years was sold out.

Canon Bower remained President for two years, followed by Mr. T. Scott Johnstone for two years. Mr. Johnstone was a botanist, with a good local knowledge of his subject, and he helped the Society considerably in a branch of Natural History in which it was weak. Then, in 1912, Mr. J. W. Branston was our President, and still another subject—Minerals—was added to our interests.

During the period between 1904 and 1913, many field meetings were held in the spring and summer months, among the places visited being Southwaite, Tarn Lodge and Hayton Moss, Edenhall, Lowther Castle, Hoddam Castle, Rockcliffe Marsh, Fingland Rigg Moss, Geltsdale, Tindale Tarn, &c. Most of these were very successful from a social point of view, and some interesting collecting was also accomplished now and then. Also during this period the Society held one or two conversaziones in the Art Gallery, when a selection of people outside the Society were invited, and members made special exhibits from their collections, and displays of lantern slides were given. These social affairs gave a good deal of pleasure to the visitors, several of whom became members.

A second Volume of Transactions appeared in 1912 of about twice the bulk of the first, and it also was very well received. The membership of the Society about this time reached its maximum, being rather over 60, and the general affairs of the Society and the interest in the meetings were as good as they had ever been.

In November, 1913, Mr. E. B. Dunlop was elected President. The following year the Great War broke out, and although the Society carried on its meetings during the winter of 1914-1915, the circumstances of the time were such that interest in our affairs inevitably flagged.

In 1916, only one ordinary and one field meeting (Rockcliffe) were held. The Society's 22nd Annual Meeting, on January 18th, 1917, was attended by two members only, and the minutes consisting of two lines, are the shortest in our records. The next meeting, in 1917, was on November 22nd, and was also an annual one—the 23rd—when it was decided to try to resume activities.

With Mr. G. B. Routledge again President, old interests were in a small measure revived, and although for several sessions we did not have many papers the hope of better times coming encouraged the Society to carry on.

In 1920 and 1921, Mr. W. R. Robinson was President. The annual report for 1920 comments on the number of members the Society had lost through death during the preceding few years, which included three who had been Presidents.

1921 saw the Society still recovering from the set-back of the war. Several rather good field meetings were held in that year, and also in the previous year, viz., at Rockcliffe, Fishgarth, Orton and Cumwhitton Moss. During this period of depression the Society's financial position continued sound, and funds in hand were steadily increasing, so that in 1923, with the assistance of a few friends, it became possible to publish a third volume of Transactions, after an interval of nearly eleven years. This volume enabled the Society to continue and complete some of the serial contributions of the earlier volumes.

In 1922, in addition to the ordinary meetings, several public meetings were held in the Museum, when Mr. B. Johnston and the Rev. H. D. Ford gave talks to small audiences. These were not without result, as at least two active young naturalists joined us as new members. Several more spectacular lectures were arranged later in the Art Gallery and elsewhere, but did nothing whatever towards increasing the membership. The experience indeed was much the same as it has been 20 years before, when we tried popular lectures as a means of increasing the membership. Following Mr. Robinson, Mr. Robt. Leighton was President for a year. In his year of office eight new members joined, and a catalogue of books in the Society's small but growing library was drawn up. The year 1923 saw the addition of eleven new members, some, however, not active. This has always been a misfortune with the Society. Every year since its inception numbers of new members have joined us, a large proportion of whom have apparently been insufficiently interested in Natural History to keep in touch with the Society, and have drifted away, some indeed never attending a meeting after their election.

We are now getting to recent times, and the events in the Society's history will be within the knowledge of most of you. The Presidents of these later years have been Mr. T. L. Johnston — one of our oldest members ; Miss Mounsey-Heysham, always a helpful friend, and so far the only Lady-President we have had ; Mr. B. Johnston once more, this time for a period of two years ; and Mr. L. E. Hope again, for a period of three years.

During this time the Society has gone on steadily with its work, and published its fourth volume of Transactions, which, judging from press notices, has been quite up to the standard of previous volumes.

Mr. Hope's Presidency ended in October, 1929, when, to the regret of members, his activities at Tullie House were ended by retirement, and his subsequent removal from Carlisle deprived us of his attendance at the meetings. In recognition of his services, he was unanimously elected an Hon. Life Member of the Society.

During the years 1930 and 1931, the President of the Society was the Rev. H. D. Ford, a lepidopterist of repute, who has done much good work in Cumberland, and by his zeal and enthusiasm has inspired the Society to fresh efforts at a time when some new stimulus was needed. The meetings under his charge proved to be among the most interesting in the Society's career, and in October, 1931, when Mr. Ritson Graham commenced a two year's Presidency, the attendance continued to be very good indeed, with numerous young members of promise with whom will rest ultimately the responsibility of carrying on the work upon which the Society has been engaged for practically 40 years.

BIRDS IN CARLISLE

By B. JOHNSTON.

(Read February 12th, 1931).

By its position and environment I consider Carlisle a very favourable centre from which to view bird life. Built on the banks of the Rivers Eden, Caldew and Petteril, in close proximity to the salt marshes of the Solway Firth where large numbers of birds congregate, with large woodlands, and Kingmoor Nature Reserve quite near, Hammond's Pond and two local Cemeteries within its boundaries, it is not surprising that a considerable proportion of the 260 species or thereabouts of birds in the Cumberland list should have occurred in our ancient City.

For many years I have taken note of the different birds to be seen in the City. One night, while listening to a Church Service at the corner of Dale Street and Denton Street, just as it was getting dark I noticed a Tawny Owl flying around. Owls were not common birds at that time, and the observation set me thinking of various other uncommon birds I had seen in the town. I was induced to draw up a list and was surprised at the number and variety I had met with. Since then I have continued to make observations from year to year, adding numerous species to my list, with the result that up to the present time I have notes of 108 species actually seen and carefully identified. Such species as two kinds of Geese, Great Black-backed Gull, Nightjar, Curlew and Whimbrel were seen on the wing, but to others I have been able to get quite near and satisfy myself what they were.

Whilst many of the birds to be referred to in this account are to be seen all over the City, others have only been observed in specially favoured places, such as Eden Bridge, the fields adjacent to St. James' Church before they were built upon, the Public Park, the various allotment gardens, Chatsworth Square

Gardens, and the trees around Murrell Hill House. Many birds also frequent the Cemetery on Dalston Road, and also at Upperby. Of late years I have found Brunton Park a good observation post while Hammond's Pond (Pleasureland), now called Upperby Park, has yielded some interesting records.

An analysis of my list shows that 15 species I have seen but once; 21 are not common, although I have known 4 of them to nest; 26 may be frequently seen; 50 I have found nesting, of which 30 are fairly common; the other 20 I am afraid have ceased to nest within the City, although still very near.

The full list of Carlisle birds is as follows :—

Carriion Crow	..	..	<i>Corvus corone corone</i> , L.
Hooded Crow	..	..	„ <i>cornix cornix</i> , L.
Rook	..	..	„ <i>frugilegus frugilegus</i> , L.
Jackdaw	..	..	<i>Coloeus monedula spermologus</i> , (Vieill.)
Magpie	..	..	<i>Pica pica pica</i> , (L.)
Jay	..	..	<i>Garrulus glandarius rufitergum</i> , Hart.
Starling	..	..	<i>Sturnus vulgaris vulgaris</i> , L.
Greenfinch	..	..	<i>Chloris chloris chloris</i> , (L.)
Hawfinch	..	..	<i>Coccothraustes coccothraustes coccothraustes</i> , (L.)
Goldfinch	..	..	<i>Carduelis carduelis britannica</i> , (Hart.)
House Sparrow			<i>Passer domesticus domesticus</i> , (L.)
Tree Sparrow	..	..	„ <i>montanus montanus</i> , (L.)
Chaffinch	..	..	<i>Fringilla coelebs coelebs</i> , L.
Brambling	..	..	„ <i>montingrilla</i> , L.
Linnet	..	..	<i>Carduelis cannabina cannabina</i> , (L.)
Lesser Redpoll	..	..	„ <i>linaria cabaret</i> , P. L. S. Müll.
Bullfinch	..	..	<i>Pyrrhula pyrrhula nesa</i> , Math. & Ired.
Corn Bunting	..	..	<i>Emberiza calandra calandra</i> , L.
Yellow Hammer			<i>Emberiza citrinella citrinella</i> , L.
Reed Bunting	..	..	„ <i>schoeniclus schoeniclus</i> , (L.)
Snow Bunting			<i>Plectrophenax nivalis</i> , (L.)
Skylark	..	..	<i>Alauda arvensis arvensis</i> , L.
Pied Wagtail	..	..	<i>Motacilla alba yarrellii</i> , Gould.
Grey Wagtail	..	..	„ <i>cinerea cinerea</i> , Tunst.
Yellow Wagtail	..	..	„ <i>flava rayi</i> , (Bp.)

Tree Pipit ..	..	..	<i>Anthus trivialis trivialis</i> , (L.)
Meadow Pipit ..	..	..	,, <i>pratensis</i> , (L.)
Goldcrest ..	..	..	<i>Regulus regulus anglorum</i> , Hart.
Great Tit ..	..	..	<i>Parus major newtoni</i> , Prazak.
Coal Tit ..	..	..	,, <i>ater britannicus</i> , Sharpe & Dress.
Blue Tit ..	..	..	,, <i>coeruleus obscurus</i> , Prazak.
Long-tailed Tit ..	..	..	<i>Aegithalos caudatus roseus</i> , (Blyth.)
Tree Creeper ..	..	..	<i>Certhia familiaris britannica</i> , Ridgw.
Waxwing ..	..	..	<i>Bombycilla garrulus</i> , (L.)
Spotted Flycatcher ..	..	..	<i>Muscicapa striata striata</i> , (Pall.)
Common Whitethroat ..	..	..	<i>Sylvia communis communis</i> , Lath.
Garden Warbler ..	..	..	,, <i>borin</i> , (Bodd.)
Blackcap ..	..	..	,, <i>atricapilla atricapilla</i> , (L.)
Grasshopper Warbler ..	..	..	<i>Locustella noevia noevia</i> , (Bodd.)
Sedge Warbler ..	..	..	<i>Acrocephalus schoenobaenus</i> , (L.)
Willow Warbler ..	..	..	<i>Phylloscopus trochilus trochilus</i> , (L.)
Chiff Chaff ..	..	..	,, <i>colybita colybita</i> , (Vieill.)
Mistle Thrush ..	..	..	<i>Turdus viscivorus viscivorus</i> , L.
Song Thrush ..	..	..	,, <i>philomelus clarkei</i> , Hart.
Redwing ..	..	..	,, <i>musicus</i> , L.
Fieldfare ..	..	..	,, <i>pilaris</i> , L.
Blackbird ..	..	..	,, <i>merula merula</i> , L.
Redstart ..	..	..	<i>Phoenicurus phoenicurus phoenicurus</i> , (L.)
Black Redstart ..	..	..	,, <i>ochrurus gibraltariensis</i> , (Gm.)
Redbreast ..	..	..	<i>Erithacus rubecula melophilus</i> , Hart.
Whinchat ..	..	..	<i>Saxicola rubetra rubetra</i> , (L.)
Wheatear ..	..	..	<i>Oenanthe oenanthe oenanthe</i> , (L.)
Hedge Sparrow ..	..	..	<i>Prunella modularis occidentalis</i> , (Hart.)
Dipper ..	..	..	<i>Cinclus cinclus gularis</i> , (Latham.)
Wren ..	..	..	<i>Troglodytes troglodytes troglodytes</i> , (L.)
Swallow ..	..	..	<i>Hirundo rustica rustica</i> , L.
House Martin ..	..	..	<i>Delichon urbica urbica</i> , (L.)
Sand Martin ..	..	..	<i>Riparia riparia riparia</i> , (L.)
Cuckoo ..	..	..	<i>Cuculus canorus canorus</i> , L.
Swift ..	..	..	<i>Apus apus apus</i> , (L.)
Nightjar ..	..	..	<i>Caprimulgus europaeus europaeus</i> , L.
Kingfisher ..	..	..	<i>Alcedo atthis ispida</i> , L.

Barn Owl	..	.. <i>Tyto alba alba</i> , (Scop.)
Tawny Owl	..	.. <i>Strix aluco sylvatica</i> , Shaw.
Sparrow Hawk	..	.. <i>Accipiter nisus nisus</i> , (L.)
Kestrel	..	.. <i>Falco tinnunculus tinnunculus</i> , L.
Cormorant	..	.. <i>Phalacrocorax carbo carbo</i> , (L.)
Gray Lag Goose	..	.. <i>Anser anser</i> , L.
Pink-footed Goose	..	.. „ <i>brachyrhynchus</i> , Baillon.
Whooper Swan	..	.. <i>Cygnus cygnus</i> , (L.)
Bewick's Swan	..	.. „ <i>bewickii bewickii</i> , Yarr.
Mute Swan	..	.. „ <i>olor</i> , (Gm.)
Mallard	..	.. <i>Anas platyrhynchos platyrhynchos</i> , L.
Teal	..	.. „ <i>crecca crecca</i> , L.
Goldeneye	..	.. <i>Bucephala clangula clangula</i> , (L.)
Heron	..	.. <i>Ardea cinerea cinerea</i> , L.
Woodcock	..	.. <i>Scolopax rusticola rusticola</i> , L.
Common Snipe	..	.. <i>Capella gallinago gallinago</i> , (L.)
Jack Snipe	..	.. <i>Limnocryptes minimus</i> , (Brünn.)
Dunlin	..	.. <i>Calidris alpina schinzii</i> , (Brehm.)
Redshank	..	.. <i>Tringus totanus totanus</i> , (L.)
Common Sandpiper	..	.. <i>Tringa hypoleucos</i> , L.
Curlew	..	.. <i>Numenius arquata arquata</i> , (L.)
Whimbrel	..	.. „ <i>phaeopus phaeopus</i> , (L.)
Golden Plover	..	.. <i>Charadrius apricarius apricarius</i> , L.
Ringed Plover	..	.. „ <i>hiaticula hiaticula</i> , L.
Lapwing	..	.. <i>Vanellus vanellus</i> , (L.)
Oyster Catcher	..	.. <i>Haematopus ostralegus ostralegus</i> , L.
Common Gull	..	.. <i>Larus canus canus</i> , L.
Herring Gull	..	.. „ <i>argentatus argentatus</i> , Ponc.
Great Blackbacked Gull	..	.. <i>marinus</i> , L.
Lesser Blackbacked Gull	..	.. „ <i>fuscus affinis</i> , Reinh.
Black-headed Gull	..	.. „ <i>ridibundus ridibundus</i> , L.
Little Gull	..	.. „ <i>minutus</i> , Pall.
Kittiwake	..	.. <i>Rissa tridactyla tridactyla</i> , (L.)
Common Tern	..	.. <i>Sterna hirundo hirundo</i> , L.
Little Tern	..	.. „ <i>albifrons albifrons</i> , Pall.
Black Tern	..	.. <i>Chlidonias niger niger</i> , (L.)
Storm Petrel	..	.. <i>Hydrobatys pelagicus</i> , (L.)
Red-necked Grebe	..	.. <i>Podiceps grisegena grisegena</i> , (Bodd.)

Little Grebe	..	.. <i>Podiceps ruficollis ruficollis</i> , (Pall.)
Landrail	..	.. <i>Crex Crex</i> , (L.)
Moorhen ..	..	.. <i>Gallinula chloropus chloropus</i> , (L.)
Coot ..	..	.. <i>Fulica atra atra</i> , L.
Stock Dove	..	.. <i>Columba aenas</i> , (L.)
Ring Dove	..	.. „ <i>palumbus palumbus</i> , L.
Pheasant	..	.. <i>Phasianus colchicus</i> , L.
Partridge	..	.. <i>Peraix perdix perdix</i> , (L.)

Notes on 15 species seen but once in Carlisle :—

Hooded Crow.—I have seen one near Upperby, just within the boundary.

Hawfinch.—A small flock seen near Holme Head.

Snow Bunting.—Seen in the town.

Waxwing.—One in Chiswick Street.

Black Redstart.—One in the Public Park.

Cuckoo.—One in the Public Park ; this was a bird of the year, and it stayed a few days.

Nightjar.—I saw one of these night-feeding birds hawking for flies over Denton Holme Allotment Gardens about 4 p.m., quite an unusual time for a bird of this species to be active. Some years before a nightjar was brought to me which had been killed by a passenger train engine, and so brought into the town. Its capacious mouth was almost full of insect life, many of which crawled out. The bird had evidently caught its prey quicker than it could swallow it. The late Rev. H. A. Macpherson, who got this bird, was much interested in it, as it was moulting at the time, in August, when this species leaves us.

Bewick's Swan.—One on the River Eden near the bridge.

Whimbrel.—One heard calling over the Bog Road just before dark. I thought this bird had lost its companions judging by the din it was making.

Great Black-backed Gull.—One of these fine birds seen flying quite low over Denton Holme.

Kittiwake.—One, probably a storm-driven bird, on Bog Road consorting with Black-headed Gulls. It did not stay long.

Black Tern.—One for a few days on the river at Eden Bridge.

Storm Petrel.—One storm-driven bird at Holme Head for a few days.

Red-necked Grebe.—On the Eden above the bridge.

Stock Dove.—One in Denton Holme district.

The following group of 21 species are not common in the city, although in times past many of them have nested therein. Several nest very near the city yet. One, the Goldcrest, nested quite lately, and the Sedge Warbler still does so, at Hammond's pond :—

Jay.—I have seen this pretty bird on two or three occasions.

Tree Sparrow.—Single birds noticed, generally in the company of House Sparrows.

Brambling.—This winter visitor I have met with on the Dalston Road.

Bullfinch.—In Leabourne Lea Allotments (now built on), I have known nests not far from there.

Corn Bunting.—Near the Cemetery. Several pairs nest not far from there.

Tree Creeper.—I have seen several in the Newtown district.

Goldcrest.—Near the Cemetery.

Coal Tit.—Not seen for some time.

Long-tailed Tit.— Do.

Garden Warbler.—Denton Holme Allotments.

Blackcap.—Driven away by building operations ; never plentiful.

Grasshopper Warbler.—Many years ago one or two pairs frequented Denton Holme district, but I have not seen nor heard the species of late.

Sedge Warbler.—Used to be at Holme Head. Now frequents Hammond's Pond (Upperby Park).

Chiff-chaff.—Heard this year near the Cemetery.

Sparrow Hawk.—Last seen near Brunton Park.

Woodcock.—On swampy ground, Longsowerby.

Jack Snipe.—In a gutter near St. James' Church.

Little Gull.—When, some years ago, the Sands were being filled in, five of these birds were at the tip for some days. A year or two later one was at the Currock ash tip for two or three days along with other gulls.

Coot.—May be seen at Hammond's Pond ; commoner now than formerly.

Pheasant.—Seen near St. James' Church. Last October one was in Murrell Hill House grounds for some time.

Partridge.—I have seen this species in Norfolk Road.

The next group of 26 species may frequently be seen in the City or crossing over :—

Redwing.—**Fieldfare.**—These two winter visitors are often met with, especially the former.

Kestrel.—For several years before the present gas works were erected, a Kestrel frequented the rough land thereabouts, and almost daily was to be seen hovering and hunting for food. I have seen it far up Crown Street flying low.

Cormorant.—On the Eden, and also passing overhead.

Gray Lag Goose.—**Pink-footed Goose.**—Both species often crossing the city in varying sized flocks.

Whooper Swan.—On River Eden (see Transactions, Vol. ii., page 189).

Mallard.—**Teal.**—**Goldeneye.**—These three ducks, all noted at Hammond's Pond (Upperby Park).

Heron.—On River Caldew, at Holme Head.

Common Snipe.—May be met with in any swampy place. On one occasion a bird was flushed within 50 yards of 4,000 noisy spectators at a Rugby match, after play had been in progress over an hour.

Dunlin.—**Redshank.**—Both at Hammond's pond, and sometimes seen flying overhead.

Common Sandpiper.—On River Caldew, at the Grassing.

Curlew.—Frequently seen and heard crossing the city. It is perhaps the bird most frequently heard passing overhead at night.

Golden Plover.—In company with Lapwings at Holme Head.

Lapwing.—Large flocks frequently to be seen.

Oyster Catcher.—On the Eden and Caldew. On the latter river it has bred.

Common Gull.—**Herring Gull.**—**Lesser Black-backed Gull.**—**Black-headed Gull.**—These four Gulls have changed their habits considerably in my time. They are now common town birds.

Common Tern.—**Lesser Tern.**—Both on the River Caldew.

Little Grebe.—On both the Eden and the Caldew.

The following group of 50 species have all nested in the city. Five of them, viz., the Goldcrest, Long-tailed Tit, Garden Warbler, and Blackcap have already been mentioned in group ii., but not as to their nesting :—

Carrion Crow.—Seen at various points. Nests in Rickerby Park, and has done so in the Cemetery.

Rook.—A common nesting species where suitable trees are available. I have known a nest among chimney pots in North Street, Holme Head.

Jackdaw.—Very common. Its habits of building in chimneys and blocking them makes it a perfect pest.

Magpie.—Not common, but nests annually in the Cemetery, and used to formerly in places now built upon.

Starling.—This bird has increased enormously in my time. Nests commonly in the city. A cream coloured specimen shot at South Vale Mill, was one of a brood all more or less so coloured.

Greenfinch.—A few pairs still nest within the city.

Goldfinch.—This pretty bird, near extinction locally a few years ago, is, I am pleased to say, now on the increase. I have known of several broods successfully reared well within our boundaries these last two seasons. Flocks of migrant Goldfinches of from 20 to 50 birds have requested the Currock district in October, and again in the following spring.

House Sparrow.—Only too numerous.

Chaffinch.—I have found the pretty nest of this bird on many occasions.

Linnet.—This well-known cage bird nested year by year in Leabourne Lea Allotments. The ground is now built on.

Lesser Redpoll.—This engaging little fellow nests in the Currock district.

Yellow Hammer.—I have found the nest of the " Writing Lark " frequently.

Reed Bunting.—The pretty eggs of this bird I have found on many occasions ; last year I saw them at Hammond's Pond.

Skylark.—I am afraid that this fine songster is much scarcer as a breeding species than formerly.

Pied Wagtail.—May be seen on all our rivers, and often in the streets almost at any time. I have often found nests. Some years ago an enormous flock of migrants settled on the glass roof of the Citadel Station and the Co-operative Arcade, in Botchergate, evidently attracted by the light.

Grey Wagtail.—This elegant bird of the mountain streams nests with us in the city.

Yellow Wagtail.—This canary-like bird used to be a regular nesting species on some of our railway banks, but I have not met with it lately.

Tree Pipit.—**Meadow Pipit.**—Both these Pipits formerly nested on Longsowerby. They may come back when the trees on the bank have grown up.

Goldcrest.—This, the smallest of our British birds, nested in one of the most public parts of the Cemetery, and the young were successfully reared. I have known one drop dead on a Carlisle street.

Great Tit.—Mostly seen in Winter, but many years ago I knew of its breeding in Carlisle.

Blue Tit.—Increasing. Several nests met with lately.

Long-tailed Tit.—Never plentiful. In days gone by I knew of several nests near Holme Head school.

Common Whitethroat.—A regular summer visitor. Nested freely in Leabourne Lea Allotments.

Garden Warbler.—Used to visit Denton Holme district sparingly. Nested on several occasions.

Blackcap.—Scarcer than the last. A Blackcap used to sing from the top of a tree on Longsowerby, but I have not seen nor heard one about town for a long time. Still frequents the Cemetery.

Sedge Warbler.—Formerly nested in rough hedges at Holme Head ; a few now do so at Hammond's pond.

Willow Warbler.—A well-distributed summer visitor, nesting in many parts of the city.

Mistle Thrush.—Common resident. Nests freely in the Warwick Road district. I have seen a nest on a bay window rain spout head, and another on a swing in a back yard, children using the swing every day.

Song Thrush.—Common. Two seasons ago, in Denton Holme Allotments, a pair brought up two broods in the same nest. The second set of eggs was laid a few days after the first brood of young had flown. No repairs were done to the nest. In gardens the Song Thrush (as also the Blackbird and Hedge Sparrow) will build its nest on the ground under rhubarb, cabbage and other leafy plants.

Blackbird.—Also a plentiful species. In a bowling green shrubbery a pair used one nest for two successive broods, but in this case repaired the nest before the second laying.

Redstart.—Never numerous, and only once did I find it nesting in the city.

Whinchat.—Formerly plentiful in the Denton Holme district, and nested freely at the top of Denton Street. On May 22nd, 1894, I found a Whinchat's nest with one egg, on the 25th it contained six. Visiting the nest the next day a weasel left as I got there. All the eggs were sucked and so broken that I could not tell the number the nest had finally held.

Redbreast.—Abundant in Carlisle. A nest I was shown on an outhouse window sill, screened by a black currant bush, in a garden at Etterby, contained 7 eggs on Sunday, 9 on Monday, 11 on Tuesday and 12 on Wednesday. I suspected two female birds were using the nest. Three weeks later there were nine young birds in the nest. The other eggs were fertile, but had not hatched.

Wheatear.—This, the earliest of our spring migrants to arrive usually puts in a few days in Denton Holme Allotments and thereabouts. I have records of its nesting on two occasions.

Hedge Sparrow.—Well known in the city. Last April a pair nested in a thin hawthorn hedge in the Currock district, the nest being robbed when the second egg was laid. In May they built again not far from the first site, but met with the same treatment. At the beginning of August I found a well-concealed nest containing young built between the two preceding ones. These young birds got away successfully, a fitting reward to their parents' persistent efforts.

Dipper.—This pretty water bird is a resident in our City. I know several stations where it nests annually.

Wren.—The "Chitty," as it is locally called, is to be frequently seen. I have known of nests in the town, but not lately.

Spotted Flycatcher.—I have met with this active bird in various parts of the City—Murrell Hill House gardens, the Cemetery, and elsewhere.

Swallow.—Less frequent than formerly; the removal of many cow-sheds and piggeries in which it nested may account for this.

House Martin.—A common bird, which nests freely in the area. In days gone by, English Street, in the heart of Carlisle, was a favourite place. I have known of young in the nest late in October.

Sand Martin.—About the rivers, and still nesting in reduced numbers.

Swift.—More plentiful than formerly. I know of nesting sites which have been in use over thirty years.

Kingfisher.—May be met with on any of our rivers in winter especially. Twice to my knowledge it has nested in the city.

Barn Owl.—Fairly well distributed. One pair, which inhabit a large warehouse in Carlisle where there are plenty of house mice, prefer to hunt and eat field varieties, as an examination of their cast pellets disclosed.

Tawny Owl.—This owl may be heard all over the district. Several nesting stations are known. Thanks to a better knowledge of their usefulness in keeping a check on rats and mice, Owls are much more plentiful than they used to be.

Mute Swan.—This well-known bird has nested alongside Eden Bridge on the Stanwix side of the river, and at Hammond's pond.

Landrail or Corncrake.—A bird I seldom hear where once it was of regular occurrence. During the last two seasons a pair have nested and reared young not far from Crown Street.

Moorhen or Waterhen.—Pops up in unexpected places. I have known several nests in Carlisle.

Ring Dove or Wood Pigeon.—I have a record of a nest in Denton Holme, but it breeds regularly in the Cemetery. This bird is becoming more of a town-dweller than it used to be.

ADDENDA.

Christmas, 1932.

Since the foregoing paper was written several interesting observations have been made, including the addition of four species to the list of Carlisle birds, viz. :—

Peregrine Falcon.—*Falco peregrinus peregrinus*, Tunst.

Siskin.—*Carduelis spinus*, (L.)

Tufted Duck.—*Nyroca fuligula*, (L.)

Bar-tailed Godwit.—*Limosa lapponica lapponica*, (L.)

The **Peregrine** came into the city a few times before it was shot at the Blackhall Racecourse.

A flock of seven **Siskins** frequented the Castle Bank and Public Park for a short time.

A big flight of **Bar-tailed Godwits** passed over the city.

The **Tufted Duck** was at Hammond's pond on several occasions.

The two following species may be added to the list of those nesting in Carlisle :—

Coal Tit.—A pair nested in a disused lower spout in a garden at Currock, and another pair in a hole in the wall of a building in Denton Holme, both in 1932.

Little Grebe.—Has nested and reared young these past two seasons at Hammond's pond.

MAMMALS IN CARLISLE

BY B. JOHNSTON.

(Read January 21st, 1932).

During the discussion which followed the reading of my paper last session on "Birds in Carlisle," I made the suggestion that if other forms of wild life found within the city boundaries were similarly dealt with, a good deal of useful information could be put on record. To that end I am offering a list of the Mammals I have met with in the area in question, with a few notes thereon, which may be of some interest.

Situated as it is in a rural area, with well-known Fox covers within a short distance of its boundaries, suitable fields for many forms of life, extensive garden allotments in the city itself, and three rivers flowing through it, Carlisle can be quite expected to harbour a fair number of the commoner wild animals of Britain. The extension of the city boundaries, and the inclusion of much land recently agricultural has probably been the means of preserving several creatures which otherwise could not be included in such a list as this. Eminent authorities inform us that 113 species are known to have inhabited the British Isles. Of that number only 72 now exist, fifteen of which are so scarce, or of such doubtful occurrence that they are hardly worth considering as native species.

I find I have notes of 17 species which I have observed in the area now under consideration.

The Hedgehog (*Erinaceus europoeus*, L.).—This singular little creature is among the most ancient forms of animal life. I have met with it in many parts of Carlisle. Once a pair settled among the rhubarb in my allotment in Denton Holme, and for two seasons reared their young. Before

their arrival my strawberries were being spoiled by the depredations of a small species of beetle, but the Hedge-hogs soon cleared out this pest. They had one litter of four each season. The young are born blind, and at first are unable to roll themselves into a ball. While the old ones stayed nearly three years, I soon lost sight of the young once they had left the nest.

During the winter the old ones laid up in heaps of vegetable rubbish. I was surprised at the considerable heat in one of these heaps when accidentally I broke into it. There was only one animal inside. While they stayed in the garden they seemed to become used to my presence as they showed no sign of fear.

The Common Mole (*Talpa europaea*, L.).—The Mole has been long established in Carlisle. Living underground (as it usually does), it is not often seen, but some times comes abroad at night. I have seen it on the Grassing. In Christmas week I saw soil being forced up by one of these creatures alongside a hard footpath near the Maryport Cottages. Because of its disturbance of the ground it is an undesirable creature in a garden. The structure of the Mole has been wonderfully adapted to suit its peculiar mode of life. Its activities continue all through the year.

The Common Shrew (*Sorex araneus*, L.).—I have met with the Shrew in many parts of the city. With its long snout it need not be confounded with any of the mice. The Shrew does not burrow in the ground, but lives among thick vegetation, in which it forms tunnels.

It may often be heard squeaking. In late autumn many are found dead on roads and paths. Although various other animals kill Shrews, they leave them uneaten, owing to the unpleasant scent given off from certain glands.

The Great Bat or Noctule (*Nyctalus noctula*, Schreber).—**The Common Bat or Pipistrelle** (*Vesperugo pipistrellus*, Schreber).—These, the largest and smallest of the British Bats, both occur in our area. Although mainly nocturnal, commencing

flying and feeding about the time swallows and other birds are retiring, they may occasionally be seen abroad in the day time. During winter they hibernate, hanging head downwards in some place of shelter, yet a mild spell of weather will bring them out to do what foraging they can. Last Christmas week bats were so observed. I once saw a bat seize an angler's dressed fly hook as he made a cast. When I released it from the hook it flew away.

The Common Fox (*Vulpes canis*, L.).—This wily creature I have seen on two occasions, and have heard of another being hunted and killed by hounds near Holme Head. Being nocturnal, and travelling far, it is possible foxes are oftener on the outskirts of the city than suspected. I have not, however, heard of any raids on poultry.

The Common Otter (*Lutra vulgaris*, Erxl.).—This interesting animal I have seen and heard in Carlisle on the Rivers Eden and Caldew. Some years ago a litter of cubs was reared near the Caledonian Railway Bridge which crosses the Eden at Etterby. The Otter is sometimes met with far away from water. Away from the city it is still a fairly common animal, and Otter hunting is a popular sport with some people.

The Stoat (*Mustela erminea*, L.).—I have only once met with this animal in our area. It was in the Leabourne Lea Allotments, where the abundance of mice and ground-breeding birds would ensure it a plentiful food supply.

The Weasel (*Mustela nivalis*, L.).—A common animal in Carlisle, which I see frequently. I remember a Weasel, or possibly a pair, taking up residence in a hedge-bank occupied by a large colony of rats, which were driven away in consequence, at least the survivors were, as the Weasels killed many before the rats finally departed. I have heard of a litter of young Weasels being seen on Currock Road along with their mother.

The Rabbit (*Oryctolagus cuniculus*, L.).—The Rabbit has been resident in Carlisle as long as I can remember. Formerly it haunted the various timber yards; latterly it has taken

to allotment gardens. I have seen young ones in the fields below the Bog Road. It does not increase in numbers in towns as in country districts.

The Hare (*Lepus europaeus*, Pall.).—On two occasions I have seen this timid creature in the city, once in Nelson Street, and once on Norfolk Road. Possibly they had been disturbed from the country, and chased into their unfamiliar surroundings.

The Squirrel (*Sciurus vulgaris*, L.).—Many years ago, on some trees growing in the Cemetery Lane (now Richardson Road) one of these dainty little creatures was to be seen. It is a common animal just outside the city. I once saw eleven together on a bright day in February, although snow lay on the ground.

The Brown Rat (*Epimys norvegicus*, Erxl.).—This odious and much detested animal is all too common everywhere.

The House Mouse (*Mus musculus*, L.). "A pretty but annoying little pest," aptly describes this creature, which, of course, is present in abundance in our area.

The Long-tailed Field Mouse (*Apodemus sylvaticus*, L.).—This very destructive Mouse is to be seen in many of our garden allotments. It has a habit of collecting and storing various fruits and vegetables for winter use. On my allotment one season I found heaps of unripe strawberries. Setting traps resulted in the capture of many of these mice, and enabled me to gather some fruit myself. The last one I handled was caught in a house in a trap baited with cheese.

The Field Vole (*Microtus agrestis*, L.).—Another destructive animal, which used to be fairly common in Carlisle. It may be still. Like other small rodents, it multiplies rapidly, and at times becomes a plague. The killing of hawks, owls, stoats and weasels in the interests of game preserving permits the increase of voles and similar pests.

The Water Vole (*Arvicola amphibius*, L.).—Never in my experience very common in the rivers in Carlisle, but of frequent occurrence further afield. I think the Brown Rat has driven them away from where I used to know them.

It is a matter of regret to the Society that the writer of the foregoing papers on "Carlisle Birds" and "Carlisle Mammals" did not live to see his contributions in print. He died on March 5th, 1933, and at the time of his decease was the second oldest member, having joined the Society on March 22nd, 1894. A life-long observer of wild life, Mr. Johnston was one of the Society's most consistent supporters, always ready to help others in his own special lines of study. He was frequently a member of the Council, and also a Vice-President. In the year 1905 the Society elected him President, an office he again filled in 1925 and 1926. While the two papers here published comprise his principal written contributions to the Society, he made a great many oral observations, which are duly recorded in the Society's Minute Books. His death leaves a conspicuous gap in the ranks of local bird lovers, and his presence will be much missed at the Society's meetings.—F.H.D.

COLLECTING AT LIGHT IN THE CARLISLE DISTRICT

BY H. D. FORD, M.A.

It has long been recognised that artificial light is one of the most potent means of attracting moths at night time. Next to "sugar," or perhaps equal to that means of enticement, it is the collector's best friend, and I have used it in my own house for about twenty years with results that have surprised myself.

I am writing this paper, therefore, with the purpose of giving my personal experiences as those of an ordinary collector in a district which affords no special advantages to the Entomologist, and I do so, in the first instance, as a help, perhaps, to other collectors living in or near Carlisle, and, secondly, as a contribution to the list of lepidoptera which may be found in the neighbourhood of that city, for there is little doubt that, if light was used in the outskirts of Carlisle itself, it would give remarkable results.

To begin with I think it is necessary to describe the methods I have employed. I have never had the opportunity of going afield and using the headlights of a motor car, nor of employing the flares and illuminated sheets which collectors, especially in the fens, for instance, find so efficacious. My results are those which can be obtained by anyone living in an ordinary dwelling house in the country, or in any part of the outskirts of a town.

The village of Thursby, in which I live, is not situated in a district which could be called favourable to the collector. It lies in the midst of rolling arable and pasture land, traversed by brooks, or, in one case, by the River Wampool. Dalston big wood more than two miles distant, was cut down fifteen years ago; the wonderful little woods on Orton Moss have nearly all been destroyed, and Torkin and the woods round Crofton

are sharing their fate ; there are no particular natural advantages, therefore, to make my district a favourable one from the collector's point of view, the country is bare, and is increasingly growing more bare and open ; any other spot would apparently serve equally well.

My method simply consists in placing a light at night time near an open window in a room, but careful attention to details is necessary to obtain satisfactory results. In the first instance, the room which is to serve as a moth trap must not be on the ground floor of the house ; a first floor room is much better, for moths fly higher than one would suppose, as anyone watching the bats at work will realise, and the light, to produce the best results, should be about twelve or fifteen feet above ground. A north to north-east aspect is almost indispensable, since all lepidoptera, when not disturbed, usually fly up wind, and our prevailing winds are from the south and west. Results can be obtained from other aspects, but they are by no means so satisfactory as from this. An ordinary upstairs room is all that is necessary, so long as it is not too large ; pictures and furniture form no obstacles at all, but every effort should be made to render the room as light and bright as possible. A light wall paper, with a glazed surface, forms the best back-ground, and by its reflective qualities intensifies the light which is being used. The window, if fortunately a sash window, should be opened top and bottom. Many moths will be found to fly in direct, but many others will strike against the glass, and gradually flutter upwards till they fly in through the top opening, which I consider to be essential.

Town dwellers will probably find no difficulty in using electric light. For myself, living in the country, oil and acetylene are the only two possible means that I have been able to adopt. Of these acetylene is much the most efficient illuminant, probably because of its greater brightness, possibly also because of the large percentage of ultra violet rays which it emits. The light should be so arranged as to stand back about four feet from the open window, and about its centre, not placed too high up nor too low down.

Having arranged these details, all else is simple. On any favourable night I light up as soon as dark is settling in, and generally extinguish the light about two o'clock in the morning. It is not at all necessary to attempt to capture the moths as they come in ; they seldom if ever fly out again ; it is better to leave these to themselves, and put out the light, close the window, and go to bed, leaving the results of the evening's catch to be estimated on the following day.

That can be done at leisure. A considerable number of moths will be found in the morning at rest on the walls, etc., of the room, and can be boxed and examined easily, but as a rule the majority of the previous night's catch will be found at dusk on the following evening, fluttering against the window, often in numbers. It is difficult to say what is a favourable night, but as a general rule a warm, dark night, with a south-westerly wind, will result in the largest number of captures. But, as all who have used " sugar " know, there are many exceptions to the rule. I have taken many specimens in a bright, moon-lit night, or with an easterly wind, but, as a general rule, the night that is good for the use of sugar is also good for the use of light.

By means of light I have taken well over one quarter of the species of moths recorded in the British Isles. Of course, as when using the net in day time, or when employing " sugar " at night the majority of species taken will be found to be common species, otherwise, indeed, they would not be common at all.

But light seems to have a curiously attractive power in other ways, and goes to prove to what great distances various species will travel, even those that one would consider to be weak and feeble on the wing. A tiny moth *Eupithecia nanata*, exclusively a heather feeder, comes to me at Thursby, though the heather nearest to my house is in the neighbourhood of Orton Grange, more than two miles away ; so, too, other exclusively heather-feeding and moorland moths, such as *Noctua glareosa* and *Agrotis strigula* visit me occasionally, while birch feeders like *Pheosia dictaeoides*, *Notodonta dromedarius*, *Geometra papilionaria* and others have all been taken in my trap. Coastal or sub-coastal

species have visited me occasionally, such as *Agrotis corticea*, *Miana literosa* and *Aporophyla lutulenta*, and woodland species such as *Metrocampa margaritaria*, *Hydriomena sordidata*, and *Tephrosia crepuscularia* have also come to light. In fact, the distances to which many species will wander from their usual habitat would appear to form a clue to the distribution of species, which is usually so irregular, and so difficult to account for.

On the other hand, there are some species quite common at sugar to which light is no attraction at all; I have taken both *Mania typica* and *maura* in my garden, but never at light, nor does light form any great attraction to such species as *Agrotis segetum* or *Euplexia lucipara*, which usually come to sugar in numbers, but which I have found to be very rare at light.

And the opposite appears to hold good to some extent, I notice for instance, that *Axylia putris* is recorded as somewhat uncommon in the lists of our Transactions (Vol. II.). When found at all it seems to have been taken almost always on the wing at dusk, but it comes freely to light, and in some years is almost a nuisance. An unsolved riddle about the use of light is that it attracts the males of moths only, and the females to a very slight extent; this appears to be the case with nearly every species, so that the proportion of females to males taken in this way is not more than one or two per cent. This is the only disadvantage that I know of with regard to this method of collecting, and it affords a problem which is at present unsolved. I have more than once hazarded guesses as to its solution, but guesswork is useless in a paper of this kind without some few facts to sustain it, and at present I know of none.

Finally, I subjoin a list of *Macro Heterocera* taken in my own house in this way. The same species appear, of course, in the lists of Lepidoptera published in this and other volumes of the Transactions. Yet I venture to think that this list may be a guide and a help to other collectors, and may possibly serve as a useful record of the results achieved in the neighbourhood of Carlisle by the means of light.

SPHINGIDAE, &c.

Smerinthus populi	Cosmotriche potatoria
Pheosia dictaeoides	Drepana falcataria
Notodonta dromedarius	Cilix glaucata
Lophopteryx camelina	Nola confusalis
Thyatira batis	Spilosoma menthastri
Trichiura crataegi	„ lubricipeda
Phalera bucephala	Arctia caja
Poecilocampa populi	(15 Species).

NOCTUIDAE.

Acronycta megacephala	Triphaena orbona (comes)
„ psi	„ pronuba
„ rumicis	„ and var. innuba
Craniophora ligustri (var. nigra)	„ ianthina
Bryophila perla	Aplecta nebulosa
Agrotis segetum	Barathra brassicae
„ corticea	Mamestra oleracea
„ saucia	„ thalassina
„ nigricans	„ pisi
„ exclamationis	„ dentina
„ ypsilon	Epineuronia popularis
„ obscura	Tholera cespitis
Noctua augur	Charaeas graminis
„ glareosa	Hadena adusta
„ baja	„ protea
„ c-nigrum	Bombycia viminalis
„ triangulum	Diloba caeruleocephala
„ primulae	Luperina testacea
„ dahlii	Apamea basilinea
„ rubi	„ gemina
„ umbrosa	„ unanymis
„ depuncta	Miana fasciuncula
„ xanthographa	„ literosa
„ plecta	„ strigilis
Axylia putris	„ bicoloria

NOCTUIDAE—continued.

Xylophasia rurea	Calymnia trapezina
„ and <i>var.</i> conbusta	Dyschorista fissipuncta
„ lithoxylea	Omphaloscelis lunosa
„ monoglypha	„ & <i>var.</i> agro-
Aporophyla lutulenta	toides
„ & <i>var.</i> luneburgensis	Amathes lota
Polia chi	„ macilenta
Miselia oxycanthae	„ circellaris
Euplexia lucipara	„ litura
Phlogophora meticulosa	Xanthia citrago
Hydroecia nictitans	„ flavago
„ lucens	„ fulvago
„ crinanensis	Orrhodia vaccinii
„ micacea	„ ligula
Tapinostola fulva	Eupsilia satellitia
Leucania pallens	Xylocampa areola
„ impura	Calocampa exoleta
„ comma	Cucullia umbratica
„ lithargyria	Plusia moneta
„ conigera	„ chrysitis
Grammesia trigrammica	„ bractea
Caradrina morpheus	„ festucae
„ taraxaci	„ iota
„ quadripunctata	„ pulchrina
Petilampa arcuosa	„ gamma
Rusina tenebrosa	Abrostola triplasia
Amphipyra tragopogonis	„ tripartita
Panolis piniperda	Zangclognatha tarsipennalis
Pachnobia rubricosa	„ grisealis
Taeniocampa gothica	Hypena proboscidalis
„ pulverulenta	(111 Species).
„ stabilis	
„ incerta	
„ munda	
„ opima	
„ gracilis	

GEOMETRINAE.

*Geometra papilionaria**Acidalia aversata*,, & *var. spoliata*,, *bisetata**Ortholitha plumbaria*,, *limitata**Chesias spartiata**Cheimatobia brumata**Triphosa dubitata**Eustroma silaceata**Lygris prunata*,, *populata*,, *associata**Cidaria pyraliata*,, *fulvata*,, *immanata*,, *miata**Lampropteryx suffumata**Coremia unidentaria*,, *ferrugata*,, *designata*,, *corylata**Amoebe olivata*,, *viridaria**Malenydris salicata*,, *multistrigaria**Oporabia dilutata*,, *autumnata**Xanthorhoe montanata*,, *fluctuata*,, & *var. costovata*,, *sociata**Mesoleuca ocellata**Perizoma alchemillata*,, *albulata*,, *bifasciata**Camptogramma bilineata**Hydriomena furcata**Anticlea badiata*,, *nigrofasciaria**Eupithecia oblongata**Eupithecia pulchellata*,, *assimilata*,, *vulgata*,, *castigata*,, *satyrata*,, *subfulvata*,, *nanata*,, *exiguata*,, *pumilata*,, *rectangulata**Abraxas sylvata*,, *grossulariata**Cabera pusaria**Metrocampa margaritaria**Ennomos alniaria**Selenia bilunaria*,, & *var. juliaria*,, *lunaria**Hygrochroa syringaria**Gonodontis bidentata**Himera pennaria**Crocallis elinguaris*,, & *var. trapezaria**Ourapteryx sambucaria**Opisthograptis luteolata**Hybernia rupicapraris*,, *aurantiaria*,, *marginaria*,, *defoliaria**Anisopteryx aescularia**Phigalia pedaria*

GEOMETRINAE—*continued.*

Lycia hirtaria
Pachys strataria
Boarmia gemmaria
 „ **repandata**

Tephrosia crepuscularia
Chiasmia clathrata
Thamnonoma wauaria
 (75 Species).

HEPIALIDAE.

Hepialus humuli
 „ **lupulinus**

Hepialus fusconebulosus
 (3 Species).

The above list gives a grand total of 204 species. It is difficult to estimate the exact number of British *Macro Heterocera*, as most lists and books differ slightly. But as a rough estimate, the number of species in these islands may be set down as round about 730 to 740, so that I have been able to capture well over a quarter of our British moths by means of light.

TREES IN CARLISLE.

BY DOROTHY STEWART.

Read March 31st, 1932.

In dealing with this subject one has to be content with a study of the commoner species of British trees, for Carlisle has not, apart from those grown in the nurseries, any outstanding varieties.

Excluding the parks, Carlisle, compared with other larger and more grimy cities, has few trees. Warwick Road is about the best avenue of which the city can boast, and that is periodically disfigured by severe and apparently unnecessary pollarding.

This lack of trees is being partly overcome by planting the sidewalks in the newer parts of the city, but there are many streets and roads which could have been planted in former times, where it is now impossible to do so.

Along the re-constructed road at Botcherby five species of young trees have been planted, namely :—Lime (*Tilia europæus*), Poplar (*Populus*), Sycamore (*Acer pseudo-platanus*), Elm (*Ulmus campestris*), and Alder (*Alnus glutinosa*), the last being very unusual. The reason may be that the land taken in the road-widening was of a swampy nature, and Alders are particularly suited to this type of land. Poplars, Alders and Willows have also been planted at Upperby Park where the ground is damp.

Several common species of trees are not found in any quantity within the city boundaries. The first is the Scot's Pine (*Pinus sylvestris*). I know of four trees only, one being in St. Stephen's Vicarage garden, and the others in Currock Park.

The Oaks (*Quercus pedunculata* and *Q. sessiflora*) also are scarce, a few occurring on the Brampton Road, and some in the Willow Holme district. Beeches (*Fagus sylvatica*) also are few in number. There are several at Durran Hill, a group at the top of Stanwix Bank, and a few further along the Brampton Road. Just past the Golf House, and over the boundary on the Warwick Road, is a fine row of old Beeches, the roots of which are free from the sandy soil, and hang over the steep bank down to the road. Before the building of houses on the right side of Scotland Road, there was a row of handsome Copper Beeches, but these have now been felled.

One species which I have not seen in Carlisle is the Wild Cherry (*Prunus avium*), but there is a solitary Double Cherry near St. Aidan's Church. I also have no record of Aspen.

Sycamore is one of the commonest trees in the city, and is the chief one planted in the streets. An interesting variegated form grew until recently at the bottom of Scotland Road, but like the Copper Beeches, is now missing. Plane trees (*Platanus acerifolia*) could be more extensively planted than they are. St. George's Crescent, at Stanwix, is planted with them, but pollarding has kept them from displaying their spreading greenness, and also from fruiting. In front of the St. Nicholas Arms, at the end of Grey Street, is a large, gnarled specimen of the Oriental Plane (*Platanus orientalis*) which bears a heavy crop of round, swinging fruits each year. A special point of interest with regard to this species is the curious horse-shoe-shaped marks which are thrown on the pavement when sunlight or artificial light shines through the leaves. The occurrence is similar to that caused by Water Lily leaf shadows on the bottom of a pond or stream.

The finest trees in the city are the Horse Chestnuts (*Esculus hippocastanum*), at Durran Hill Convent, and near the Fire Station. Those in the Victoria Park are also fine specimens, while those which line the approach to Fusehill Hospital, though not very large, always bear a very heavy crop of white flower spikes. Near Lismore Place is one tree of the pink-flowered variety.

Various kinds of Willow (*Salix*) are common along the Eden and Caldew banks, and at one time they were probably much commoner on the stretch of ground known as the Saucerries, because this name is derived from the generic name *Salix*. The row of big White Willows (*Salix alba*) between the Eden and the Sands, are evidently comparatively young trees in spite of their size, as in old prints of that part of the city they are not figured.

In the old Courtyard, behind Dr. Caird's house, on the Brampton Road, is a fine Black Mulberry (*Morus*), which still bears fruit. It is known to be at least 100 years old, and certainly looks its age. The main trunk has collapsed across a broad wall and a low roof, but still continues to grow. In the same courtyard are several fine Acacia trees (*Robinia pseudacacia*).

Carlisle is well off for Lombardy Poplars (*Populus pyramidalis*). Three old ones, one of which is now quite dead, stand near Eden Bridge, several in the George Street Gardens, and there are about twenty at Botcherby, along the St. Joseph's Home wall. A solitary young Lombardy stands at the junction of the Brunstock Beck and the River Eden, and a similar lonely tree on the top of a hill, on the Carleton Road, is the sole survivor of Clark's old nursery. Four or five also grow behind the Beehive Inn on Warwick Road. Several old, twisted Hawthorns (*Crataegus oxyacantha*) grow beneath them. The oldest Hawthorns in the city are along Lady's Walk, below the Castle Walls, and in Chiswick Street Gardens are about five double-red-flowered trees.

The most dignified trees of the city are in the Cathedral precincts, where they seem to have absorbed much of the solemnity of their surroundings. They are chiefly Elms, but a spreading Beam (*Pyrus aria*), which fruits heavily, and a large Laburnum (*Laburnum vulgare*) make a fine show when in flower. The large Rowan (*Pyrus aucuparia*) outside the Fraternity has been felled lately, for it died last Autumn, and did not shed its leaves.

The Pear trees on West Walls are usually in bloom very early, but this season, although they were well on soon after Christmas, have been retarded by frost.

Except for the few pollarded Poplars mixed with the Sycamores and Limes in some of the streets, there are few Poplar trees within the city. At the bend of the river, between Eden Bridge and the Memorial Bridge in Rickerby Park, are three large Black Poplars (*Populus nigra*) with scaly, ringed trunks, which appear like gigantic Birches in the distance. There is also a group of four at Willow Holme.

The dense spreading Ash trees (*Fraxinus excelsior*), and old Thorns in Rickerby Park are also worthy of note. Ash trees grown in towns are usually small, but these are extra large for that species. Near St. Mary's Laundry on the Burgh Road, is a very big Ash, the trunk of which grows against that of a large Elm, so that the two appear as one. Ash is also plentiful in Willow Holme, but the trees are much blackened by railway smoke.

Silver Birch (*Betula alba*) occurs in a few places; several gardens on Etterby Scaur, Cavendish Mount and in Chiswick Street have trees with delicate dropping branches, but I do not know of any district where both species *B. venucosa* and *B. pubescens* grow, except Kingmoor, which is not strictly speaking, within the city.

A double row of White Poplars (*Populus alba*) grew at one time at the entrance to the Grammar School playing fields, but these have been cut down. Several still grow behind the wall near the Edenside cricket ground.

Limes are common in the parks, round the Grammar School, in Chatsworth Square, Warwick Road, and round the Cemetery. Broad Street had a beautiful avenue of these trees, but severe cutting, so that practically only the trunks remain, has entirely disfigured them.

A large Spanish Chestnut (*Castanea sativa*) stands at the gate of Durran Hill Convent, and at Nazareth House, St. Anns, is a fine Portugal Laurel (*Prunus lusitanica*), which forms large fruits every year. Usually this latter species is only a shrub.

The old Siberian Crab Tree (*Pyrus baccata*) in Tullie House Courtyard, must not be forgotten, and I hope no one will be prevailed upon to have it cut down, as were the old Elm trees on the Abbey Street side of the garden. These have been replaced by double Cherries.

If more trees were planted in Carlisle, instead of so many being mutilated or felled, much could be done to beautify our already fine old city. Cherry, Prune, Crimson Hawthorns, Scarlet Oaks, Plane and Tulip trees could be planted to advantage, and we might even take a suggestion from Germany, and plant fruit trees along the road sides of the suburban districts, as is done in many of the large towns in the Rhine Valley.

THE NEUROPTERA &c., and TRICHOPTERA OF CUMBERLAND, WESTMORLAND AND NORTH LANCASHIRE

BY GEORGE B. ROUTLEDGE, F.R.E.S.

The papers on Entomology in these Transactions have hitherto been confined to the County of Cumberland. In the present contribution, dealing with Neuroptera and Trichoptera, the numerous records in the magazines from Westmorland and Lancashire North of the Sands, are included. The area thus covered embraces the whole of the English Lake district, and may be considered a natural faunal area, and one very favourable to insects such as these, many of which are aquatic in their habits. In the case of the Dragonflies, however, as the Cumberland species were fully dealt with by Mr. Day in Vol. iv., only the Westmorland and North Lancashire records are here given.

I give the following Bibliography :—

- F. H. Day, "*Transactions*," Carlisle Nat. Hist. Society, Vol. iv., pp. 131-134, "Cumberland Dragon Flies."
Orthetrum coerulescens in Cumberland, *E.M.M.*, 1904, p. 111.
"Two Dragonflies new to Cumberland," *Naturalist*, 1917, p.p. 357-358.
"Trichoptera and Neuroptera in Cumberland," *E.M.M.*, 1918, p. 40.
"Calopteryx virgo, L., in Cumberland," *Naturalist*, 1921, p. 371.
T. C. Heysham's records in "*Stephen's Illustrations*," *Mandibulata*. Vol. vi, p. 183
H. J. Holme, "Trichoptera at Ravenstonedale, Westmorland," *Vasculum*, Vol. iii., No. 1, March, 1917, p. 31.

- J. J. F. X. King, "Notes on the Neuroptera of Langdale," *E.M.M.*, 1882, xix., pp. 82-84.
 K. J. Morton, "Neuroptera and Trichoptera observed in the Lake District," *E.M.M.*, 1904, pp. 52-54.
 G. T. Porritt, "Cumberland Trichoptera taken by the Rev. E. N. Bloomfield," *Naturalist*, 1910, p. 29.
 „ "Cumberland Trichoptera, taken by G. B. Routledge in Cumberland," *Naturalist*, 1911, p. 238
 „ "Cumberland Trichoptera, taken by J. E. Thwaytes, in Cumberland, *Naturalist*, 1901, p. 64.

Initials or names of these Recorders are given in the List of Species.

The List follows the "Catalogue of British Orthoptera, Neuroptera and Trichoptera," by the late C. W. Dale, F.E.S., 1907.

NEUROPTERA.

ODONATA (DRAGONFLIES).

The species from Cumberland are omitted, as the list for that County appeared in Vol. iv., of Carlisle Natural History Society's *Transactions*, pp. 131-134.

- Sympetrum striolatum**, Charp. Langdale, common (King, *E.M.M.*, xix., p. 83).
S. scoticum, Don. Langdale, rare (King, *E.M.M.*, xix., p. 83).
Libellula quadrimaculata, L. Loughrigg Fell (King, *E.M.M.*, xix., p. 83).
Cordulia aenea, L. Rydal, during early June, 1904 (Mary L. Armitt, *Naturalist*, 1904, p. 250).
Cordulegaster annulatus, Latr. Langdale, not common (King, *E.M.M.*, xix., p. 83); Grasmere (G. T. P., *Nat.*, 1902, p. 3).
Aeschna juncea, L. Langdale, frequent (King, *E.M.M.*, xix., p. 83); Coniston (K.J.M., *E.M.M.*, xl., p. 54).
A. cyanea, Müll. Langdale (King, *E.M.M.*, xix., p. 83).
Lestes sponsa, Hans. South end of Coniston Lake, and also near Elter Water (K.J.M., *E.M.M.*, xl., p. 54).
Pyrhosoma nymphula, Sulz. Langdale (King, *E.M.M.*, xix., p. 83).

Enallagma cyathigerum, Charp. Grasmere Lake and Rydal Water (King, E.M.M., xix., p. 93). Grasmere (G.T.P., Nat., 1902, p. 3). Coniston (K.J.M., E.M.M., xl., p. 54).

EPHEMERIDAE (MAY FLIES).

Ephemera danica, Müll. Helbeck, 9, vi., 1903; Gelt, 7, vi., 1903; Carlatton, 17, vi., 1916 (G.B.R.). River Petteril, in June (F.H.D.).

Ephemerella notata, Eaton. River Eden (Cumberland), Rev. A. E. Eaton, (E.M.M., xxv., p. 12).

Rhithrogena semicolorata, Curt. Tarn Lodge, June, 1902 (G.B.R.)

Ecdyurus venosus, Fab. Gelt Wood, 24, vi., 1918 (G.B.R.). Windermere (F. Milton, E.M.M., xxxii., p. 239).

PERLIDAE (STONE FLIES).

Perla maxima, Scop. Baron Wood, Tarn Lodge, Gelt Wood (G.B.R.). River Petteril, 26, v., 1912; River Caldew (F.H.D.). River Rothay (G.T.P., Nat., 1902, p. 3).

P. cephalotes, Curt. Borders of the Lakes in Cumberland and Westmorland (Steph. Illust., vi., p. 136). River Rothay (G.T.P., Nat., 1902, p. 3).

Dictyopteryx mortonii, Klap. **microcephala**, Pict. Tarn Lodge, Gelt Wood, 23, v., 1917 (G.B.R.). Carlisle 3, iv., 1918, River Caldew, 15, iv., 1929 (F.H.D.). In Westmorland, at Rydal, during early June (Mary L. Armitt, Nat., 1904, p. 250).

Chloroperla grammatica, Poda. Tarn Lodge, Cowran Cut, Gelt Wood, Ullswater (G.B.R., Nat., 1911, p. 238). Carlisle, June 11th, 1912; May 8th, 1918 (F.H.D.). Plentiful on the Rivers near Ambleside (G.T.P., Nat., 1902, p. 3). In Westmorland (Steph. Illust., vi., p. 139, recorded as **C. media**, Steph.).

Isopteryx tripunctata, Scop. Plentiful on the rivers near Ambleside (G.T.P., Nat., 1902, p. 3). Abundant in Westmorland (Steph. Illust., vi., p. 139, recorded as **Chloroperla flava**, Steph.).

- I. torrentium**, Pict. Keswick, 6., vi., 1912 (F.H.D.). Plentiful on the Rivers near Ambleside (G.T.P., Nat., 1902, p. 3).
- Taeniopteryx risi**, Morton. Gelt Wood, 13, iii., 1918; Tarn Lodge, 9, v., 1918 (G.B.R.). Carlisle, 5, iv., 1918, and 10, iv., 1918 (F.H.D.).
- Nemoura praecox**, Morton. Gelt Wood, 13, iii., 1918 (G.B.R.). Sour Nook, 11, v., 1919 (F.H.D.).
- N. meyeri**, Pict. Tarn Lodge, Gelt Wood (G.B.R., Nat., 1911, p. 238). Carlisle, 3, iv., 1918 (F.H.D.). Coniston Lake (K.J.M., E.M.M., 1904, p. 54).
- N. cinerea**, Oliv. Gelt Wood, 19, vii., 1918, three females (G.B.R.)
- N. variegata**, Oliv. Tarn Lodge, Hayton Moss, Gelt Wood and Ullswater, occurs in April, June and July (G.B.R.).
- N. cambrica**, Morton. Carlisle, 3, iv., 1918 (F.H.D.).
- N. inconspicua**, Pict. Gelt Wood (G.B.R.). Coniston Lake (K.J.M., E.M.M., 1904, p. 54).
- Leuctra geniculata**, Steph. Hayton Moss, 17, ix., 1917 (G.B.R.). Coniston Lake, common at the bridge over the river flowing out of Lake (K.J.M., E.M.M., 1904, p. 53).
- L. klapaleki**, Kempny. Hayton Moss, October and November, 1917 (G.B.R.). Coniston, in great abundance (K.J.M., E.M.M., 1904, p. 53).
- L. inermis**, Kempny. Gelt Wood, June, 1918 (G.B.R.).
- L. nigra**, Klap. Cumwhitton Moss, 2, vii., 1918 (G.B.R.).

COPEGNATHA.

PSOCIDAE.

- Amphigerontia variegata**, Latr. Near Dungeon Ghyll, rare (King, E.M.M., xix., p. 83). Coniston, a few on walls (K.J.M., E.M.M., xl., p. 54).
- A. fasciata**, Fab. Tarn Lodge (G.B.R.).
- A. bifasciata**, Latr. Tarn Lodge, on beech trees, June and July; Hayton Moss in August (G.B.R.). Coniston, not common on juniper (K.J.M., E.M.M., 1904, p. 54). Common near Grasmere Lake and Brathay river (King, E.M.M., xix., p. 83).

- Psocus sexpunctatus**, L. Coniston, rather plentiful on walls (K.J.M., E.M.M., xl., p. 54). Frequent on the road to Dungeon Ghyll (King, E.M.M., xix., p. 83).
- P. nebulosus**, Steph. Wreay (G.B.R.). Coniston, on yews, but not common (K.J.M., E.M.M., xl., p. 54). Langdale, common (King, E.M.M., xix., p. 83).
- P. longicornis**, Fab. Hayton Moss, September, (G.B.R.). Brathay River and near Rydal Water (King, E.M.M., xix., p. 83).
- Stenopsocus immaculatus**, Steph. Langdale, abundant (King, E.M.M., xix., p. 83). Coniston, not common (K.J.M., E.M.M., xl., p. 54.).

MESOPSOCIDAE.

- Philotarsus flaviceps**, Steph. Langdale, common (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl., p. 54).
- Elipsocus hyalinus**, Steph. Langdale, abundant (King, E.M.M., xix., p. 83). Coniston, a few on walls (K.J.M., E.M.M., xl., p. 54).
- E. westwoodi**, M'Lach. Langdale, abundant everywhere (King, E.M.M., xix., p. 83).
- E. abietis**, Kolbe. Tarn Lodge, 17, x., 1917 (G.B.R.). Coniston, on Juniper (K.J.M., E.M.M., xl., p. 54).

CAECILIIDAE.

- Peripsocus phaeopterus**, Steph. Frequent in Langdale (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl., p. 54).
- Caecilius flavidus**, Steph. Common all over Langdale (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl. p. 54).
- C. obsoletus**, Steph. Rare in Langdale (King, E.M.M., xix., p. 83).
- C. fuscopterus**, Latr. Frequent in Langdale (King, E.M.M., xix., p. 83, recorded as **C. vittatus**, Dalm.).

ATROPIDAE.

- Atropus pulsatoria**, L. Tarn Lodge, common (G.B.R.). Langdale, common in the house at Skelwith Bridge (King, E.M.M., xix., p. 83).

SUBNECROMORPHOTICA.

PLANIPENNIA.

SIALIDAE.

- Sialis lutaria**, L. Gelt Wood, Irthing Valley, Hayton Moss, Edmond Castle (G.B.R.). Bowness Moss, Cumwhinton (F.H.D.). Langdale, a few (King, E.M.M., xix., p. 83). Witherslack, 21, v., 1924 (T. M. Blackman, Entom., lviii., p. 155).
- S. fuliginosa**, Pict. Tarn Lodge, June, 1918 (G.B.R.). Caldew River, 26, v., 1912, Cumwhinton Moss, 8, vi., 1918 (F.H.D.). Langdale, not common (King, E.M.M., xix., p. 83).

RAPHIDIIDAE.

- Raphidia xanthostigma**, Schum. Great Salkeld and Baron Wood (G.B.R.). Great Salkeld 19, v., 1901 (F.H.D.).

OSMYLIDAE.

- Osmylus chrysops**, L. River Petteril, at Wreay, in June (F.H.D.).

HEMEROBIIDAE.

The insects of this family are beneficial. Their larvae attack Green Fly (**Aphidae**).

- Sisyra fuscata**, Fab. Abundant about Grasmere and Rydal Water (King, E.M.M., xix., p. 83).
- Hemerobius micans**, Oliv. Tarn Lodge, Cowran Railway Bank, May, June, July and August (G.B.R., Nat., 1911, p. 238). Orton, 2, vii., 1919 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl., p. 54).
- H. nitidulus**, Fab. Tarn Lodge, Hayton Moss, Gelt Wood, in May, June and August, (G.B.R.). Cumwhinton Moss, 9, vi., 1919; Broadfield, 8, viii., 1918 (F.H.D.).
- H. humuli**, L. Tarn Lodge, Hayton Moss and Baron Wood in May and June (G.B.R.). Langdale, common (King, E.M.M., xix., p. 83). Witherslack, 19, v., 1924 (T. M. Blackman, Entom., lviii., p. 155).

- H. lutescens**, Fab. Tarn Lodge, Hayton Moss and Fenton, in May, June and July (G.B.R.). Coniston (K.J.M., E.M.M., xl., p. 54).
- H. marginatus**, Steph. Gelt Wood, July, 1903 (G.B.R., Nat., 1911, p. 238). Orton, 15, vi., 1912 (F.H.D.). A few specimens along the Brathay river (King, E.M.M., xix., p. 83).
- H. orotypus**, Walleng. Broadfield, 4, viii., 1918; Durdar, 5, vii., 1919 (F.H.D.). "Abundant in a larch wood on the East side at Coniston Lake. The greater number were beaten out of hazel, but no doubt the species was really attached to larch." (K.J.M., E.M.M., xl., p. 54).
- H. nervosus**, Fab. Tarn Lodge, Hayton Moss, occurs April to September (G.B.R., Nat., 1911, p. 238).
- H. subnebulosus**, Steph. Tarn Lodge, Hayton Moss, occurs May to September (G.B.R., Nat., 1911, p. 238). Carlisle, 8, v., 1918 (F.H.D.). On trunks of apple trees near Skelwith Bridge (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl., p. 54),
- H. stigma**, Steph. Tarn Lodge, Hayton Moss, 18, vii., 1918; also occurs in August (G.B.R., Nat., 1911, p. 238). Langdale, frequent (King, E.M.M., xix., p. 83).
- H. concinnus**, Steph. Hayton Moss, 21, vii., 1918 (G.B.R.).
- H. quadrifasciatus**, Reut. Cumwhitton Moss, 2, vii., 1918 (F.H.D.).
- Micromus paganus**, L. Tarn Lodge, Hayton Moss, Gelt Wood, Irthing Valley (G.B.R., Nat., 1911, p. 238). Orton, 14, vii., 1912, and 14, vi., 1919 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 83).
- M. variegatus**, Fab. Great Salkeld, 16, vi., 1905 (F.H.D.).
- M. angulatus**, Steph.; **aphidivorus**, Schr. Taken at Witherslack in 1863 by J. B. Hodgkinson (R. M'Lachlan, E.M.M., xxiii., 1886, p. 138).
- Drepanopteryx phalaenoides**, L. Bowness, by T. H. Allis; Windermere, by Strouvelle (F. Milton, Entom., xxxii., p. 289, and K.J.M., E.M.M., xlvi., p.p. 55-56). Witherslack on May 17th, 1924; probably flies in the evening (T. M. Blackman, Entom., lviii, p. 155). This insect has a superficial resemblance to the moth the Scalloped Hook-Tip **Drepana lacertinaria**, L., hence its scientific name.

CHRYSOPTERIDAE.

The species in the genus of **Chrysopa** are beneficial insects, their larvae feed on **Aphides** (Green Fly).

- Chrysopa vittata**, Wesm. Hayton Moss, Gelt Wood, Cumwhitton Moss, occurs in June and July (G.B.R.). Baron Wood, 28, v., 1911; Orton, 29, vi., 1918 (F.H.D.). Milbeckstock Wood, Bowness (G.T.P., Nat., 1902, p. 3).
- C. flava**, Scop. Tarn Lodge, Hayton Moss, Cowran Railway Banks, in June, July and September (G.B.R.). Langdale, common (King, E.M.M., xix., p. 83). Witherslack, 7, vii. 1925 (T. M. Blackman, Entom., lvii., p. 156).
- C. alba**, L. Occurs in June, July and August. Tarn Lodge, Gelt Wood, Hayton Moss (G.B.R.). Keswick, 6, vi., 1912; Orton, 15, vii., 1916; Cumwhitton Moss, 2, vii., 1918 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 83). Abounded in Milbeckstock Wood, Bowness (G.T.P., Nat., 1902, p. 3).
- C. flavifrons**, Brauer. Kingmoor near Carlisle, 22, vi., 1917 (F.H.D.).
- C. tenella**, Sch. Tarn Lodge, Hayton Moss, Cumwhitton Moss, occurs in May, June and July (G.B.R.).
- C. vulgaris**, Sch. Tarn Lodge, 14, vii., 1918; one specimen taken in the house, 17, xii., 1917; (G.B.R.). Keswick, 6, vi., 1912; Orton, 15, vii., 1916 (F.H.D.).
- C. prasina**, Ramb. Hayton Moss, in July (G.B.R.).
- C. phyllochroma**, Wesm. Cumwhitton Moss, 8, vi., 1918 (F.H.D.).
- C. perla**, L. Orton, 29, vi., 1918 (F.H.D.).

CONIOPTERYGIDAE.

- Coniopteryx aleyrodiformis**, Steph. Langdale (King, E.M.M., xix., p. 83).
- C. lactea**, Wesm. Langdale (King, E.M.M., xix., p. 83).

PANORPIDAE (SCORPION FLIES).

- Panorpa communis**, L. Gelt Wood (G.B.R.). Wreay, 27, v., 1900; Orton, 14, vii., 1912; Durdar (F.H.D.).

52 THE NEUROPTERA, &c., AND TRICHOPTERA.

P. germanica, L. Tarn Lodge, Hayton Moss, Fenton, Gelt Wood (G.B.R.). Baron Wood, 28, v., 1911; Orton (F.H.D.). Some strongly marked specimens at the foot of Hardknot Pass (P. J. Barraud, Entom., xl., p. 67). Langdale, common (King, E.M.M., xix., p. 83).

TRICHOPTERA (CADDIS FLIES).

In their early stages the larvae construct cases to live in, and are found in rivers and ponds.

INAEQUIPALPIA.

PHRYGANEIDAE.

Neuronia ruficrus, Scop. Cumwhitton Moss, 14, vi., 1916 (G.B.R.). Cumwhitton Moss 8, vi., 1918, and 15, vi., 1932 (F.H.D.).

Phryganea striata, L. Tarn Lodge in May and June (G.B.R. Nat., 1911, p. 238). Ambleside (G.T.P., Nat., 1902, p. 3).

P. obsoleta, M'Lach. Tarn Lodge, July and August (G.B.R., Nat., 1911, p. 238). Taken in Cumberland (Entom. Annual, 1859, p. 67).

P. varia, Fab. Tarn Lodge, one specimen in June (G.B.R.). Eel Tarn, taken by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Eel Tarn, July, 1916 (P. J. Barraud, Entom., xl., p. 67). Common near Elter Water (King, E.M.M., xix., p. 83). Coniston (K.J.M., E.M.M., xl., p. 53).

LIMNOPHILIDAE.

Grammotaulius atomarius, Fab. Tarn Lodge, Hayton Moss, in June and August (G.B.R.). Near Carlisle (Entom. Annual, 1859, p. 75). Steph. Illust., vi., p. 213, under **Limneria lineola**, Steph.

Glyptotaelius pellucidus, Retz. Tarn Lodge, 9, viii., 1918 (G.B.R.). Cumwhitton Moss, 8, vi., 1918 (F.H.D.). "At Coniston, but much commoner at Esthwaite, one male a very beautiful dark variety," (K.J.M., E.M.M., xl., p. 53).

Limnophilus rhombicus, L. Hayton Moss, one specimen in July (G.B.R.). Ambleside (G.T.P., Nat., 1902, p. 3).

- L. marmoratus**, Curt. Eskdale, taken by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Langdale, common (King, E.M.M., xix., p. 83). Coniston, very common (K.J.M., E.M.M., xl., p. 53).
- L. stigma**, Curt. Taken by J. E. Thwaytes at Newby Cross (G.T.P., Nat., 1901, p. 64).
- L. lunatus**, Curt. Ravenstonedale, in Westmorland (H.J.H., Vasculum, iii., 1917, p. 31). Langdale, common everywhere, on the South side of Rydal Water, excessively abundant (King, E.M.M., xix., p. 83). Coniston, most abundant (K.J.M., E.M.M., xl., p. 53).
- L. elegans**, Curt. Cumwhitton Moss, one specimen, 30, vi., 1917 (G.B.R., E.M.M., liii., p. 279).
- L. nigriceps**, Zett. Tarn Lodge, in October (G.B.R., Nat., 1911, p. 238).
- L. centralis**, Curt. Occurs June to September, Tarn Lodge, Hynam, Wetheral (Nat., 1911, p. 238) ; Cumwhitton Moss, 6, vii., 1918 (G.B.R.). Kingmoor (F.H.D.). Eel Tarn, by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Langdale, very common (King, E.M.M., xix., p. 83).
- L. vittatus**, Fab. Tarn Lodge, 6, viii., 1918, Hayton Moss (G.B.R.). Coniston (K.J.M., E.M.M., xl., p. 53).
- L. affinis**, Curt. Irthing Valley, one specimen 18, vi., 1900 (G.B.R.). Ravenstonedale, Westmorland (H.J.H., Vasculum, iii., 1917, p. 31).
- L. auricula**, Curt. Hayton Moss by beating fir trees, occurs July to September (G.B.R., Nat., 1911, p. 238). Great Salkeld, ix., 1912, River Petteril, 7, x., 1917 (F.H.D.). Carlisle (Entom. Annual, 1859, p. 83, and Steph. Illust., vi., p. 220). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston (K.J.M., E.M.M., xl., p. 53).
- L. extricatus**, M'Lach. St. Bees by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Ambleside (G.T.P., Nat., 1902, p. 3).
- L. luridus**, Curt. Hayton Moss, vii., 1918 ; Cumwhitton Moss, 2, vii., 1918 (G.B.R.). Kingmoor, 4, vii., 1918 ; Cumwhitton Moss 2, vii., 1918 (F.H.D.). Eskdale by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29).

- L. sparsus**, Curt. Occurs May to August, Tarn Lodge, Cowran Railway Banks, Hayton Moss (E.M.M., liii., 1917, p. 279.; G.T.P., Nat., 1911, p. 238). Orton, 16, vii., 1917, 8, viii., 1919; Newton Marsh, 24, v., 1919 (F.H.D.). Bolton Fell by J. E. Thwaytes (G.T.P., Nat., 1901, p. 64). Langdale, abundant (King, E.M.M., xix., p. 83). Coniston, common (K.J.M., E.M.M., xl., p. 53).
- L. fuscicornis**, Ramb. Ravenstonedale (H. J. Holme, Vasculum, i., 1917, p. 31).
- Anobolia nervosa**, (Leach) Curt. Great Salkeld, ix., 1912; River Petteril, 14, x., 1917, (F.H.D.). Langdale, not common (King, E.M.M., xix., p. 83). "Coniston, in multitudes, differing much in size at different points of the lake" (K.J.M., E.M.M., xl., p. 53).
- Stenophylax stellatus**, Curt. Hayton Moss, one specimen in August, (G.B.R.). Langdale, abundant (King, E.M.M., xix., p. 84). "Taken rather commonly hiding in the crevices of a wooden house at the Ferry near Bowness, Windermere. The lake examples are smaller than the average specimens from large rivers." (K.J.M., E.M.M., xl., p. 53).
- S. latipennis**, Curt. Coniston Lake (K.J.M., E.M.M., xl., 1904, p. 54).
- S. permistus**, M'Lach; **concentricus**, M'Lach. nec Zett. Tarn Lodge, occurs May, June and September (G.B.R., Nat., 1911, p. 238). Taken by J. E. Thwaytes at Newby Cross (G.T.P., Nat., 1901, p. 64).
- Mesophylax impunctatus**, M'Lach. "Three females were taken by beating and sweeping at night. They were all from a comparatively limited stretch of the lake margin at Coniston, near a point at which a beck enters the lake. Never found in the daytime." (K.J.M., E.M.M., xl., p. 53).
- Micropterna sequax**, M'Lach. Hayton Moss, Castle Carrock Fell, in September (G.B.R., E.M.M., liii., 1917, p. 279).
- Halesus radiatus**, Curt. Tarn Lodge, in September (G.B.R.). Great Salkeld, September, 1912, River Petteril, 7, x., 1917 (F.H.D.). Taken by J. E. Thwaytes, at Carlisle (G.T.P., Nat., 1901, p. 64). A few on the Brathay river (King, E.M.M., xix., p. 84). Coniston, rather common (K.J.M., E.M.M., xl., p. 53).

- H. digitatus**, Schr. Tarn Lodge, in June and September (G.B.R.). Carlisle (Entom. Annual, 1859, p. 95; Steph. Illust., vi. p. 209).
- H. auricollis**, Pict. Tarn Lodge, Gelt Wood, in May, June and September (G.B.R.).
- H. guttatipennis**, M'Lach. Great Salkeld, September, 1912 (F.H.D.).
- Drusus annulatus**, Steph. Tarn Lodge, in August and September (G.B.R., Nat., 1911, p. 238). Langdale, rare (King, E.M.M., xix., p. 84). Coniston, rather common (K.J.M., E.M.M., xl., p. 53).
- Ecclisopteryx guttulata**, Pict. Tarn Lodge, Hayton Moss, in June and July (G.B.R., Nat., 1911, p. 238). Abundant on all the rivers near Ambleside (G.T.P., Nat., 1902, p. 3).
- Chaetopteryx villosa**, Fab. Great Salkeld, September, 1912 (F.H.D.).
- Apatania muliebris**, M'Lach. On April 22nd. to 28th, 1918, in beck running through Tarn Lodge Meadow, all specimens were females; males of this species are unknown (G.B.R.).

SERICOSTOMATIDAE.

- Sericostoma personatum**, Spence. Tarn Lodge, one specimen in June (G.B.R.). River Petteril, June, 1912 (F.H.D.). Carlisle (Entom. Annual, 1859, p. 100, recorded as **S. spencii**. Kirby; Steph. Illust, vi., p. 185). Langdale, a few specimens (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3).
- Goëra pilosa**, Fab. Tarn Lodge, one specimen in June, (G.B.R.). St. Bees, taken by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). On Elter Water, rarely (King, E.M.M., xix., p. 84). Common on rivers near Ambleside (G.T.P., Nat., 1902, p. 3).
- Silo pallipes**, Fab. Common in June to August flying over roads at Heads Nook and Cairn Bridge (G.B.R.). River Petteril, June, 1912 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston (K.J.M., E.M.M., xl., p. 53).

Brachycentrus subnubilus, Curt. Fishgarth, on River Eden, very common on May 15th, 1920. A large number of specimens taken in the Tullie House grounds in May, 1930 (G.B.R.). Carlisle, May 8th, 1918, and May, 1930 (F.H.D.). The species swarmed all over Carlisle in May, 1930.

Crunoecia irrorata, Curt. Cairn Bridge, July 31st, 1915, one specimen (G.B.R.). Langdale, three specimens (King, E.M.M., xix., p. 84). Frequent at suitable places near Coniston (K.J.M., E.M.M., xl., p. 53).

Lepidostoma hirtum, Fab. Tarn Lodge, in August and September (G.B.R., Nat., 1911, p. 238). Carlisle, 10, viii., 1918 (F.H.D.). Langdale, common everywhere (King, E.M.M., xix., p. 84). Coniston (K.J.M., E.M.M., xl., p. 53). Common on the side of Lake Windermere, at the Ambleside end (G.T.P., Nat., 1902, p. 3).

Lasiocephala basalis, Kol. Keswick, 6, vi., 1912 (F.H.D.).

AEQUIPALPIA.

LEPTOCERIDAE.

Beraea maurus, Curt. Tarn Lodge, Hayton Moss, June and August, Cumwhitton Moss, 2, vii., 1918 (G.B.R.). One female at Coniston (K.J.M., E.M.M., xl., p. 53).

Odontocerum albicorne, Scop. Eskdale, taken by Rev. E. N. Bloomfield (G.T.P., Nat., 1910., p. 29). Carlisle (Entom. Annual, 1860, p. 67). Common about Carlisle (Steph. Illust., vi., p. 193).

Leptocerus fulvus, Ramb. Seen only at Brothers' Water; the species was over in September (K.J.M., E.M.M., xl., p. 53).

L. alboguttatus, Hagen. Very common near Skelwith Bridge (King, E.M.M., xix., p. 84).

L. annulicornis, Steph. Currock, 4, vi., 1919 (F.H.D.).

L. aterrimus, Steph. In July and August, at Tarn Lodge and Edmond Castle (G.B.R.). Langdale, abundant (King, E.M.M., xix., p. 84).

L. cinereus, Curt. Tarn Lodge, one specimen in July (G.B.R.). Carlisle, 18, vi., 1918 (F.H.D.). Langdale (King, E.M.M., xix., p. 84). Coniston Lake (K.J.M., E.M.M., xl., p. 53).

- L. albifrons**, L. Among rushes on Elter Water (King, E.M.M., xix., p. 84).
- L. commutatus**, M'Lach. River Petteril (F.H.D.).
- L. bilineatus**, L. Tarn Lodge, Irthing Valley, June (G.B.R.). Carlisle, 18, vi., 1918 (F.H.D.). Carlisle (Entom. Annual, 1860, p. 74, recorded as **L. bifasciatus**, Oliv.). (Steph. Illust. vi., p. 198, as **L. affinis**). St. Bees, by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Elter Water (King, E.M.M., xix., p. 84).
- L. dissimilis**, Steph. Langdale, not common (King, E.M.M., xix., p. 84). Fresh specimens occurred at Coniston Lake, but were not numerous (K.J.M., E.M.M., xl., p. 53).
- Mystecides nigra**, L. Langdale, not common (King, E.M.M., xix., p. 84).
- M. azurea**, L. River Petteril, 9, vi., 1900, 13, vi., 1912 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston, very abundant (K.J.M., E.M.M., xl., p. 53).
- M. longicornis**, L. Turling Dub, near Castle Carrock, one specimen in July (G.B.R., E.M.M., liii., 1917, p. 279). Langdale, common; "a nice yellow variety of this species occurred, in which the dark markings are nearly obliterated" (King, E.M.M., xix., p. 84).
- Triaenodes bicolor**, Curt. About the lake at Tarn Lodge, in July and August (G.B.R.). Common by sweeping the reeds on Elter Water (King, E.M.M., xix., p. 84).
- Oecetis ochracea**, Curt. Turling Dub, in July (G.B.R., E.M.M., liii., p. 279).
- O. furva**, Rambl. Rare at Elter Water (King, E.M.M., xix., p. 84).
- O. lacustris**, Pict. Tarn Lodge and Turling Dub, in July (G.B.R.). Common on Elter Water (King, E.M.M., xix., p. 84). Coniston, in September, nearly over (K.J.M., E.M.M., xl., p. 53).
- O. testacea**, Curt. Elter Water (King, E.M.M., xix., p. 84). Coniston, the female was still pretty common (K.J.M., E.M.M., xl., p. 53).

Setodes argentipunctella, M'Lach. Type specimens taken near Windermere, September, 1876 (J. B. Hodgkinson, E.M.M., xiv., 1877, p. 105 and xix., p. 82). Common along the Brathay river (King, E.M.M., xix., p. 84). " Occurred at different points at Coniston Lake, in September, but nearly all were females " (K.J.M., E.M.M., xl., p. 53). Described as a new species by R. M'Lachlan in E.M.M., xiv., p. 105, on the Windermere specimens.

HYDROPSYCHIDAE.

Hydropsyche fulvipes, Curt. Carlisle (Entom. Annual, 1861, p. 15, and Steph. Illust., vi., p. 174).

H. instabilis, Curt. Tarn Lodge and Hayton Moss, in July and August (G.B.R., Nat., 1911, p. 238). River Caldew, 19, v., 1912; Carlisle, 25, vi., 1918 (F.H.D.). St Bees, by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Ambleside (G.T.P., Nat., 1902, p. 3). Near Skelwith Bridge (K.J.M., E.M.M., xl., p. 54).

H. angustipennis, Curt. Tarn Lodge one specimen, in July (G.B.R.). St. Bees, taken by the Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29).

H. guttata, Pict. Tarn Lodge, one specimen in September (G.B.R.). Langdale, common everywhere (King, E.M.M., xix., p. 84).

H. lepida, Pict. A few taken along the Brathay river (King, E.M.M., xix., p. 84).

Philopotamus montanus, Don. Rare in the Brathay river (King, E.M.M., xix., p. 84). Coniston, not common (K.J.M., xl., p. 54).

Wormaldia occipitalis, Pict. Frequent at suitable places near Coniston (K.J.M., E.M.M., xl., p. 54).

W. subnigra, M'Lach. Tarn Lodge, one specimen in August (G.B.R., Nat., 1911, p. 238). Rare on the Brathay river (King, E.M.M., xix., p. 84). One at Skelwith Force (K.J.M., E.M.M., xl., p. 54).

- Chimarra marginata**, L. Cumberland (Steph. Illust., vi., p. 191).
A few on stones on the bed of the Brathay river (King, E.M.M., xix., p. 84).
- Neureclipsis bimaculata**, L. Langdale, two specimens (King, E.M.M., xix., p. 84).
- Plectrocnemia conspersa**, Curt. Tarn Lodge, one specimen in July (G.B.R., Nat., 1911, p. 238). St. Bees taken by Rev. E. N. Bloomfield (G.T.P., Nat., 1910, p. 29). Ambleside (G.T.P., Nat., 1902, p. 3). One or two only at Coniston (K.J.M., E.M.M., xl., p. 54).
- Polycentropus flavomaculatus**, Pict. Tarn Lodge and Ullswater, occurs in June, July and August (G.B.R.). Langdale, common (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston common (K.J.M., E.M.M., xl., p. 54).
- P. kingi**, M'Lach. Langdale, rare (King, E.M.M., xix., p. 84). Brathay River, near Ambleside (King, E.M.M., xviii., p. 163).
- Holocentropus picicornis**, Steph. Langdale, frequent (King, E.M.M., xix., p. 84).
- Cyrnus trimaculatus**, Curt. Langdale, common everywhere (King, E.M.M., xix., p. 84). At Coniston (K.J.M., E.M.M., xl., p. 54).
- C. flavidus**, M'Lach. Rare on Elter Water (King, E.M.M., xix., p. 84).
- Ecnomus tenellus**, Ramb. Tarn Lodge, one specimen in August (G.B.R.).
- Tinodes waeneri**, L. Tarn Lodge, two specimens in August, 1911 (G.B.R.). Langdale, common on all the streams (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston, common (K.J.M., E.M.M., xl., p. 84).
- T. aureola**, Zett. Tarn Lodge, one specimen in June (G.B.R.).
- T. dives**, Pict. Ullswater, two specimens in June (G.B.R.). Cross Fell and Ousby, June, 1885 (Rev. A. E. Eaton).
- Psychomyia pusilla**, Fab. Tarn Lodge and Hayton Moss, August 15th, 1910, and July 29th, 1911 (G.B.R.).

RHYACOPHILIDAE.

- Rhyacophila dorsalis**, Curt. Tarn Lodge, Gelt Wood, June, August and September (G.B.R., Nat., 1911, p. 238). Carlisle, taken by J. E. Thwaytes (G.T.P., Nat., 1901, p. 64). Great Salkeld, September, 1912 (F.H.D.). Langdale, common (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). Coniston, common (K.J.M., E.M.M., xl., p. 54).
- R. obliterated**, M'Lach. Ravenstonedale (H. J. Holme, Vasculum, iii., 1917, p. 31). Coniston, frequent (K.J.M., E.M.M., xl., p. 54).
- Glossosoma boltoni**, Curt. Gelt Wood, in June (G.B.R.).
- G. vernale**, Pict. Carlisle, 5, iv., 1918, 8, v., 1918; Newton Marsh, 24, v., 1919 (F.H.D.). Langdale common (King, E.M.M., xix., p. 84). Ambleside (G.T.P., Nat., 1902, p. 3). One at Torver Beck (K.J.M., E.M.M., xl., p. 54).
- Agapetus fuscipes**, Curt. River Cairn, at Carlatton, 1, viii., 1915, and 2, vii., 1918 (G.B.R.). Langdale, common (King, E.M.M., xix., p. 84).
- A. comatus**, Pict. Hayton Moss, 11, vi., 1911 (G.B.R.). Carlisle viii., 1918 (F.H.D.). Ambleside (G.T.P., Nat., 1902, p. 3).

HYDROPTILIDAE.

- Hydroptila femoralis**, Eaton.; **longispina**, M'Lach. Ambleside, common (King) (M'Lachlan's European Trichoptera, 1st Additional Supplement, 1884, p. 71). Perhaps the same species taken at Langdale among the rushes on Elter Water (E.M.M., xix., p. 84).
- H. tigurina**, Ris. Near Ambleside, in 1881, not uncommon, identified by K. J. Morton (King, E.M.M., xxxi., p. 112).
- Ithytrichia lamellaris**, Eaton. Along the Brathay burn (King, E.M.M., xix., p. 84).
- Orthotrichia angustella**, M'Lach. Brathay burn (King, E.M.M., xix., p. 84).
- Oxyethira costalis**, Curt. Brathay burn (King, E.M.M., xix., p. 84).

ON THE BUZZARD

BY E. BLEZARD.

Read February 25th 1932. Revised April, 1933.

A peculiarity of the fell country is the manner in which quick-rising winds suddenly fill the quiet, secluded dales with a volume of sound. Such outbursts arouse the buzzards from their home crags to sport in the teeth of the blast. With the primaries of their broad wings like splayed fingers, they wheel in clean-cut, powerful sweeps, and tower to stoop with furled pinions or spin round each other in spiral dives to the accompaniment of their own long-drawn cries from which enjoyment has banished the ordinarily querulous tone. Once the buzzard has been seen revelling in the high winds that sweep its haunts, it can no longer be regarded as the sluggish creature that the huddled, perching attitude and slow-flapping hunting flight suggest. Neither is it the coward so often described, for although frequently harassed by the powerful peregrine and raven, it is quick to attack should either approach the nesting site, and against human intruders it can be so bold as to swoop within striking distance.

These notes have been gathered in the neighbourhood of Carlisle ; in and around the northernmost of the Lake Fells, and along the Pennines of Cumberland and Westmorland ; many of my days in the field having been spent with Mr. Ernest Glaister and Mr. Ritson Graham.

The fells of the sister counties afforded retreats in the days when the buzzard was banished from the lowland woods. In Cumberland, at least, its numbers have increased of late years, and there is now a distinct movement back to the woodlands.

This movement is largely eastward, and extends over the area once covered by the Forest of Inglewood, no doubt a stronghold of the species in the past. Against the possibility of an over-estimation, it should be recorded that in his paper, "The Fauna and Flora of Buttermere," read to the Society in 1931, the Rev. G. A. K. Hervey mentioned that the buzzard had decreased in the Buttermere district. The increase is well marked in the Pennines, where there are now considerably more than the two pairs described in "The Birds of Cumberland," published in 1886.

There is still a good deal of persecution. The birds that winter in the woods close to the city, on the South, linger well into spring, and it is more than likely that they would nest if unmolested. Four of the wintering stock of 1922-23 were killed on one estate, the last in April. In January, 1931, one was found which, along with six owls, representing three species, had been taken in a pole-trap. On one of my visits to a pair in a Pennine dale, I found that the sitting bird had been trapped at the nest, and had claw-holed the three eggs in its frenzied struggles to escape.

In April, 1926, a pair of buzzards had taken up quarters close to one of the old-time Eden Valley haunts. Their presence excited more than ordinary interest, and the next month saw the finding of their nest of three eggs in a dead pine. They continued to nest, and although one bird is known to have come to grief, a pair are still in occupation. Last season (1932) they nested in a pine, and reared two young, the third being found to have died in the egg, which remained in the nest.

Nesting becomes general in April, but sometimes laying is delayed until May. Within their territory birds change their sites year by year, not often using the same nest twice in succession. Some sites, especially in the case of birds favouring both crags and trees, are spread over a wide area, and a mile or more apart; others are closely grouped as within the confines of a small gill, or in certain lines of crags where range is restricted owing to the claims of peregrine and ravens.

Jealous of their chosen territory, the birds in spring forget the peaceful association of winter, when two pairs or more may unite, and readily come to blows. One hard-fought battle, besides being remarkable as an exhibition of flight, was distinguished by the presence of a peregrine, which circled the two combatants in the manner of a referee.

The regular tree nesters, owing to their having more positions to choose from, appear more inclined to the building of a new nest each year. Disused tree nests make excellent homes for other species, such as tawny owl and kestrel, both of which I have found in possession. Crag eyries are too frequently in very simple positions, and while a broad ledge is the more usual choice, some nests are confined within narrow limits. A position on a crag, where support is afforded by an outgrowing tree, is a favourite one.

Nests in the Lake Fells are usually well built of heather stems, mountain ash sticks, and turf; grass, dead bracken, and wood-rush being used for lining. In the bleak Pennine dales, where material is scarcer, nests are mainly formed of turf, with the addition, perhaps, of a few sticks, heather stems, or even the dead stalks of thistle or stinging nettle. I have found sheep's wool* in small quantities in the lining of at least six nests, with the exception of one in park land, all in Pennine crags. One misty morning in the Pennines, I flushed a bird just as it had laid an egg in a nest no more than a depression in a turf-covered ledge surrounded by the merest handful of heather and umbellifer stems.

I have known an old raven's nest taken over and put into use. From it the single young one was prompted on its first flight in the month of August.

Tree nests often appear loose and untidy from below, but are soundly constructed. Nests in pine plantations are occasionally built almost entirely of fresh, green pine sprays.

The earliest sign of activity sometimes is a leafy spray placed on an old nest, as though to indicate ownership. This is perhaps necessary where there is a demand for homes by other species.

As a suggestion, it might point to the origin of the buzzard's practice of adding foliage to the nest during the incubation and fledging periods. The practice varies with different birds; some are lavish with greenery, others content with an odd spray or two. To some extent, the fresh, green leaves cover up the offensive matter which accumulates while young are being reared, but seldom is there sufficient to serve this purpose. I have always found some amount of greenery in nests holding young, and have seen nests containing highly incubated clutches without any at all; while two nests from which the eggs had been taken were almost covered over. The green, and often flowering sprays, are plucked from whatever trees or herbs are growing near by, mountain ash being most commonly used in the fells. Others seen are: bleaberry, cowberry, lesser willow-herb, ivy, heather, holly, cherry, willow, birch, beech, pine, spruce, and club-moss. The aforementioned adopted raven's nest had long, flowering stems of rose-bay willow-herb around the rim, and one tree nest built of green pine was embellished with the delicate sprays of larch.

An unusual item in the structure of a crag eyrie was the bleached skeleton of a rabbit, but whether it arrived by accident or design could not be told.

Eggs are laid at intervals of so many as four days, and incubation beginning with the first is evidenced by the varied size of the young in a brood. While the clutch normally is three, it may number two, or one only. Exceptionally, four eggs are laid as in the following two instances. One eyrie held four young, all of which were strong and well-feathered on my last visit. The other contained three young, and outside it lay a broken egg, which appeared to have been added.

At the time the young are clothed in grey down relieved by a white nape spot, they are curiously indifferent to human intrusion, and even willing to be fed by hand from the prey in the nest. Later, when feathered and more vigorous, they resent handling, and defend themselves in the manner characteristic of birds of prey, that is, by flopping over on to the back, and striking out with the talons.



A FAMILY OF FOUR IN THE PENNINES.

BUZZARD

Photos. : E. Blezard.



EYRIE IN A RE-OCCUPIED LOWLAND HAUNT.



When young are being fed, the captured prey is first carried to some appointed station, generally a grassy knoll, to be plucked and broken before taken to the nest. These plucking mounds are conspicuous features in the home quarters when littered all over with fur from the many young rabbits which figure in the fare. Prey is mostly of the furred variety, rabbits, voles, and moles being taken in quantity, while others of our smaller mammals, even to shrews, do not come amiss. Birds are occasionally captured; the remains of a stock-dove were found at one eyrie. Examination of castings reveals that a good many dor-beetles are eaten. Carrion is more a hard weather diet; I have dissected buzzards in winter, amazingly fat, and crammed to the beak with "braxy" mutton. Frog spawn is an item noted as found twice in the same tree nest.

The buzzard hunts for small game in an owl-like manner, working to and fro at no great height with slow wing strokes, and turning with precision each time it reaches the limits of its beat. It begins the day's activities at an early hour, appearing on wing at the first glimmer of light, as noted on occasions when I have waited on the fells for the sun to break over the tops.

Roosting places, once chosen, are used for an indefinite period, and become clearly defined. During nesting time it is evident that the male remains close by the eyrie, whose whereabouts are betrayed more by the down scattered at the roost than that shed by the brooding bird. A certain small limestone outcrop, noted as a roosting resort out of nesting season, became in one year the site of the eyrie.

In 1925 I found that a buzzard in the Skiddaw group had the same unusual habit of swooping at people as the one so distinguished from 1901 to 1912 in the Windermere district, and described by the late E. B. Dunlop in his "Lakeland Ornithology," Vol. III., of our Transactions. This later bird, resembling the other in being a very dark plumaged male, was, on the day in question, first seen perched on a commanding spur of the nesting crags. From there he moved to a rock above within a few yards, where he sat intently studying me until

just as I disturbed his mate from the nest, he surprised me by suddenly stooping at my head from behind. Time after time he came, always from the rear, and without crying, so that only the rush of wings gave warning as he hurled down to within two or three feet of my head. As usual with his kind, when stooping and carried by the impetus of the downward plunge, he would remount on the abrupt upward swing for a remarkable distance before re-spreading his wings. When I neared the nest, his attentions ceased, and he soared to join his mate in crying over the dale. What I took to be the same bird, one day later went up Sharp Edge in short flights before me, stopping at every stage to regard my approach until I was near enough to prompt another flight.

One of our most useful birds in keeping in check voles, rats, and mice, the buzzard is also a figure without which our fell country would lose some of its interest and charm. With the peregrine, raven, and dotterel, it is included in that distinctive Lakeland company of wild life with which few other faunal areas can compare.

*A Pennine nest containing two eggs, examined May 28th, 1933, was liberally lined with sheep's wool, and had, in addition, a scrap of newspaper.

THE BARNACLE GOOSE ON THE ENGLISH SOLWAY.

By T. L. JOHNSTON.

(Read March 31st, 1933).

The Barnacle Goose (*Branta leucopsis*, Bechst.) is a well-known winter visitor to Great Britain and Ireland, plentiful in the Outer and Inner Hebrides and West coast of Scotland, a regular visitor to the Orkneys, but only visiting the Shetlands on passage. It is more numerous on the West coast than the East, fairly common in the Solway area; further south is only known as a rare visitor, but fifty or more years ago was common on the Lancashire coast. In Ireland it is a regular visitor to the coasts and islands of Connaught and County Donegal, rare in the southern part. During the last few years this species has shown a decided decrease on the English side of the Solway, and whatever the cause may be, each year fewer birds visit this well-known locality.

The changed conditions of the Solway marshes, due to various causes, must have a great influence on the fauna of the area, and I will try to explain the changes which have taken place on each of the well-known haunts from my own observations.

My own opinion is that the food supply has no longer the attraction for them; what was formerly good feeding ground is now covered with a long, coarse grass. The staple food consists of fine young marsh grass, which grows on newly-formed marsh; there will also be found on the same places the Jointed Glass Wort (*Salicornia herbacea*) known to the local people as Sandforth and Samphire. This, when ripe, is eagerly eaten, the stems being nipped off. At certain periods they are fond of the green *Algae*, common objects on all the scaurs.

Along the shores of the English side of the Solway we have some of the best marsh land to be found in the county, comprising Rockcliffe and Burgh Marshes, divided by the River Eden and a broad expanse of sand. In Moricambe Bay we have Long Newton and Skinburness Marshes, also the adjoining Border and Brownrigg Marshes divided by the River Waver. There is also a smaller marsh situated along the shore from Bowness to Anthorn, but owing to its close proximity to a main road for a few miles, is not much frequented by wildfowl, except a portion near Cardurnock Point. These marshes are formed of alluvium deposits, and are drained by deep, natural creeks, caused by the ebb and flow of the tides, covered with a good growth of grass, which provides excellent grazing for large numbers of cattle all the year round.

With the exception of Rockcliffe Marsh (which is private property belonging to the Castletown estate), all the other marshes are stinted, each farmer or landowner in the district having so many stints attached to his place. There are also a number of privately-owned stints. The owner or tenant of a stint has the right of grazing from May to the end of October for one head of cattle, or three sheep, or one yearling horse. The price of stints varies from year to year, according to the demand, the privately-owned ones are let by public auction. During the last few years large numbers of Herdwick sheep have been brought down from the Lakeland hills and wintered, when they can always get plenty to eat, a difficult task on the high hills during a severe winter.

After this brief introduction, I will deal with each marsh individually.

Rockcliffe Marsh is the largest, and one of the best for wildfowl. It is situated at the extreme eastern point of the Solway Firth, a peninsula lying between the River Eden, on the south, and the River Esk on the north side. These two rapid running rivers have a great influence in changing the formation of this marsh, which is in such a position that it is always changing, and has done so for a considerable time. One of the earliest maps

published was a map of the "Debatable Land" in 1552 which shows Rockcliffe Marsh as a round peninsula, and Aglionby's Platt of 1590 is very similar, but Crawford's map, of 1832, shows the point of the marsh to be West of a line drawn from King Edward's monument, on Burgh Marsh, to the mouth of the River Sark. These maps would not be as perfect as our present-day Ordnance Survey maps, but still they give us some idea of what the ground was like at that period. From these old maps it is easily seen that the upper end of the Solway has steadily changed.

In 1834, the Parish Minister of Gretna reported that large tracts of marsh land had commenced to be covered with merse grass, but this was on the Scotch side, although I have no doubt the same thing applied to the English side. This new formation on both sides of the Solway must have had a great influence on the fauna of the locality, hence the increase in marsh-feeding species, due to the abundance of suitable feeding ground.

When Macpherson & Duckworth's "Birds of Cumberland" was published, in 1886, this was the best marsh on the Solway, frequented at that period by large flocks of Barnacle. During the previous twenty years they had increased from 200 to 400, until the flocks numbered from 600 to 1,000. In Macpherson's "Fauna of Lakeland," he first noticed a decrease in 1888, but says they now preferred the marshes bordering the Wampool and Waver. This marsh was still a noted place for many years, and I have watched with great interest from Burgh Marsh their flight up and down the channel when disturbed, hoping they would pay a visit, so that I could realise my ambition of shooting a Barnacle. At this period all the feeding ground was on the western point on the low marsh lying between the high water mark and the high marsh, the River Eden running along the edge of Burgh Marsh causing a big erosion on the marsh, which increased the area of feeding ground on Rockcliffe.

About the year 1910 the River Eden changed its course, and instead of flowing along Burgh side, made another channel, which washed away all the low marsh, thus destroying the best feeding ground, which caused the birds to seek new pastures.

At the present time much of the high marsh is being washed away at the same place, due to the action of the River Eden and the strong ebb tides of the Solway. On the north side of the marsh the change occurs the opposite way, for instead of erosion we have accretion. What was formerly sand and mud flats is now solid, low marsh ground, and during the last few years hundreds of acres have been added.

This has been caused by the River Esk changing its course, which at one time ran almost parallel with the marsh, but now is close to the Scotch side of the Solway. This new marsh is formed by the constant action of the tide depositing new sand which, after a time, settles down into a solid mass, and in a short period grass commences to grow. The first commencement of new marsh are patches, formed in circles, growing larger until they unite, which in a few years soon cover all the suitable ground, the growth of new grass being very rapid. This new growth is the staple food of the Barnacle, but at the present time very few birds frequent this locality, although last winter, 1932, six Barnacle frequented it for some time, two being shot. After comparing the status of this goose in Macpherson's time and the present day, one is quite at a loss to understand why they should almost desert such a favoured locality. After the low marsh was washed away on the western point, all the birds seem to have deserted this place, and from what information I can gather it is nearly thirty years since they left.

In regard to Burgh Marsh, it is not to be compared with its neighbour, all the geese which are either seen or shot here come from Rockcliffe. Many years ago, when Barnacle were plentiful on Rockcliffe, a fair number were shot at night on Burgh marsh when they came to feed on the low marsh, but after the numbers decreased, their visits to this marsh ceased. Mr. Isaac Waite, a keen wildfowler and good observer, reported to me that it is over 20 years since he shot a Barnacle on Burgh, but that he had seen them several times passing over on migration during the day time, making straight for Long Newton, never wavering in their flight when passing over this marsh.

Burgh Marsh has lost an enormous amount of ground during the last 40 years, where the tide and River Eden keep undermining the edge of the marsh, causing the banks to fall. This erosion extends from Easton to Burgh Marsh point, but at the present time, with the changed river course, a new sandbank has been formed in what was formerly the bed of the river, extending from the point westward, rapidly forming new marsh, which in time to come will make suitable feeding ground for geese. At the present time I find traces of Widgeon feeding on it, but the Herdwick sheep have also found that the new grass is a tasty bite, so it does not get much chance at present to make much headway.

The formation of Long Newton Marsh has, during the last 50 years, changed considerably, and what were formerly sand banks is now good marsh land. Anyone well acquainted with this marsh will at once notice a well defined ledge or terrace running all along the marsh from the River Wampool to the Waver, in a line almost parallel with the hedge bordering the marsh. Lower down there is another terrace similar to the first, which used to be the edge of the original marsh. Mr. James Storey, of Anthorn, can remember this well, and after putting a big breakwater in the Wampool, which kept the river from breaking through the marsh, new grass commenced growing on the sand banks, which in a few years covered a large area, and soon became a good haunt of Barnacle. The first haunt was on the edge of the river, at a place known as Newlands, but as the new marsh grew rapidly and extended, it gave the geese a much larger feeding range, and each succeeding year saw an increase in numbers. This occurred at the time when the Rev. H. A. Macpherson first noticed the decrease on Rockcliffe, in 1888, which shows at once that the increased food supply on Long Newton had attracted their attention.

At the N.E. point of this marsh a very large sandbank was formed, known locally as the "Island" and divided from the low marsh by a deep creek through which the tide used to flow. When I first knew it, many years ago, very little grass grew

on it, but after a few years grass rapidly covered the whole "Island," the deep creek gradually filled up with sand, until at the present time it is almost on a level with the adjoining marsh. This new formation gradually extended all along the marsh, until it reached the Waver, and terminated in a long sand bank lying between the Wampool and Waver, known as the "Point."

About twenty-five years ago this bank began to form into marsh land, intersected by very shallow creeks, but in a few years, through the action of tides, they were deep enough to give one plenty of cover when creeping up them. This was one of the best haunts for many years, but I am sorry to say that during the last few years all this has changed, and instead of being covered with natural marsh grass, it is now growing some very rank, long white grass, and the only birds which find any food there are Mallard and Teal, during the autumn feeding on the grass seeds. I have every reason to believe that this portion will soon be washed away if the Waver keeps on changing its course, the same as it is doing at the present time. Along the west side of the marsh runs the Waver, and the changed course of the river has commenced to expose a scaur, which has been covered with sand and marsh for about thirty years. It was on the edge of this scaur that Mr. W. Nichol, of Skinburness, the noted naturalist, had his record shot at Barnacle, on December 12th, 1892, when he killed forty.

It would be interesting to know the cause of the change in the nature of marsh grass, which for the first few years is entirely free from weeds, but after a time gets into a very rough state if allowed to grow rank, more especially if there are not enough cattle to keep the quick growth down. When the new marsh is often covered by tides, the grass always keeps short and fresh. This may be caused by the tides depositing a thin layer of sand, and so keeping the grass short. We have a good example of this on a small part of Cardurnock Marsh, which is always covered, except by the lowest tides. This part has retained its freshness, and I have often seen Widgeon feeding there during the day in early spring.

Skinburness Marsh has always been a good haunt ; the east end being the best feeding ground, where the low marsh commences near Starry Hill Scaur, and continues along the Waver in conjunction with Border and Brownrigg Marshes.

Mr. W. Nichol and his father, both well-known wildfowlers, shot in this place a good number of geese between forty and fifty years ago, and in one season obtained 76 Barnacle with shoulder guns. At that period large numbers visited this locality, Grey Geese being unknown to visit these marshes at that time.

New marsh was rapidly forming, hence the increase in the number of birds frequenting this area. This new marsh was formed by the erosion of part of the marsh near to Grune Point and re-deposited on the low lying sand bank, which in course, of time commenced to grow grass.

A comparison of the high water marks mapped by Ordnance Survey, in 1860 and in 1900, shows that on Skinburness Marsh 95 acres have been lost by erosion, but that 260 acres have been gained by accretion. This may look at first to be rather out of place, but to anyone who knows the district it is easily accounted for. The part where the erosion takes place is the N.W. point, near the Grune Point, where the marsh has the deepest deposit of alluvium about 10 feet thick. This is carried away by the flood tides in large quantities, and deposited on level ground over a large area, hence the big difference in the erosion and accretion areas.

During the last few years very little new marsh has been added, and what was formerly the best feeding ground is now coarse, rough grass, the only suitable ground being on the extreme edge, with the result that Barnacle have almost deserted this once favoured locality. In the last 30 years this same portion has lost a much larger area, but instead of forming new marsh, has changed the estuary, forming large sand banks, and covering certain scaurs. There are numerous scaurs of shingle and boulders situated on islands of boulder clay, two of these Stenor and Tickhill have been completely sanded over for nearly 30 years.

Different parts of partially submerged ridges of scaurs are being exposed from time to time by the movements of sand banks, due in a great measure to the action of the rivers changing their courses. During the winter of 1931, Mr. W. Storey, of Anthorn, found one of these scaurs exposed, which he examined, and was surprised to find a very good example of fishing trap, made with branches of gorse, in a good state of preservation. Near at hand, under a big boulder, he found an old-fashioned horn drinking cup, which he kindly presented to Tullie House. No one in the district could remember this scaur being exposed before, but in a few days it was again sanded over.

The sanding up of these scaurs has caused a large number of different species of birds to seek pastures somewhere else ; Stenor and Tickhill being two of the best feeding grounds in the estuary.

A few years ago the Waver changed its course, with the result that it formed a large sand bank under the edge of marsh where all the erosion has taken place, and new marsh grass soon commenced to grow. During the last two years this area has increased, and has been a resting place at certain states of tide for large numbers of Oyster Catchers. It gives me some satisfaction to report that Barnacles have now begun to frequent it, their first visit being noted during the first week in February, 1933.

The Barnacle is a well-known winter visitor to the Solway, and has been so for a considerable period, both Dr. Heysham and his son, T. C. Heysham, recording it, probably from Rockcliffe Marsh, in 1833. Its arrival is eagerly looked for both by naturalist and wildfowler, and when in conversation with anyone interested in bird life, it is quite a common phrase to hear them say with delight " Barnacles have arrived."

They generally arrive during the early part of October, but I have several times seen them during the latter part of September, and once as early as September 21st, 1913, when a party of 30 arrived on Newton Marsh. A small party generally arrives first, to be followed later, often the next day, by larger numbers, until they reach full strength.

Their line of direction during migration is N.E. both coming and returning, but very little seems to be known about the exact line which they take when passing from the east coast to the west, a distance of about 60 miles. They probably leave the sea somewhere on the Berwickshire coast, and pass overland. Very few birds are seen on the Northumberland coast line ; the largest party, 40 to 50 birds, being recorded by Mr. George Bolam on Holy Island, on October 16th, 1922, but they rested for a few hours only. It is a pity we cannot get some good inland observers on this flight line, well acquainted with the call notes of the different species of geese, and if the numbers could be stated, whether large or small, we should then be in a position to know whether all the birds on the Solway came from the same breeding ground in Spitzbergen, or part of them from Greenland.

It is a well-known fact that they arrive in this country by two routes, one passing down the West coast of Scotland, probably Greenland breeding birds, and the other from Spitzbergen down the coast of Norway, crossing the North Sea to the East coast. When on migration their well-known call can be heard at a great distance, and one can at once realise that long ago, before bird migration was thought about, it filled the country people with awe and superstition as they heard these strange sounds during the long winter nights passing through the dreary and desolate country from East to West, like a pack of Harriers in full cry, which they called "Gabriel's Hounds."

On arriving at their destination, feeding ground is eagerly looked for, and after fighting up and down the marsh, they soon alight if suitable ground presents itself, at the same time calling lustily. If not disturbed, they are purely day feeders, and are night feeders only out of necessity, not from choice. When feeding, sentinels are always on the look out for danger, and while the main body are busily engaged, these birds are to be seen standing erect, keeping a constant look-out in all directions. During the day feed they are very interesting to watch, and are constantly quarrelling with one another, and one is indeed lucky to get anywhere near, unless a suitable creek is in the

vicinity. To do this during the day one has probably to creep up one creek and down another, a very difficult task. Unless one is well acquainted with the place, it is almost impossible to get near the birds.

After feeding for most part of the day, they fly down to the river or a shallow pool left by the receding tide, where they perform their toilet, washing and preening themselves. It is surprising the amount of grass a single goose can consume; a Barnacle Mr. J. Storey had confined in a garden consumed three large handfuls of grass between 12 noon and 5 p.m., although it had been fed several times during the morning. This bird had only been a week in captivity, but showed no signs of fear or alarm when visited. It commenced to feed rapidly as soon as food was put down. The grass was swallowed in big bunches, so large that one almost thought the goose would choke, at the same time it uttered the well-known note, which always denotes the Barnacle is feeding. I have often crept up some of the creeks during the night until I got close to a party feeding, and listened with delight to the sound of the busy birds as they swallowed the grass, at the same time heard the boom, boom, boom, their feeding note, a sound well-known to most wildfowlers.

When molested they change their habits, and become night feeders, resting on the exposed sandbanks in the estuary or in the main channel of the Solway during the day. Before the main body leave the sandbanks, scouts go over the ground, and if all is clear of danger, the main body soon arrive.

It was many years before I found out about these scouts, and I was often curious about them when I heard a single bird, or sometimes two, fly along the sand, then come back by the edge of the marsh, calling loudly all the time. I have had several shots at these birds, and then began to realise, whether I killed or missed, the same thing happened—the main body did not put in an appearance until hunger drove them to it, and by that time one was tired of waiting, and generally leaving the place when they arrived. This occurred several times, until I found out the cause of their late arrival, sometimes as late as 1 or 2 a.m.

If the scouts do not locate you, the main body are not long in putting in an appearance, but at the same time they are always wary before alighting on the ground, and will fly round the place several times, each time coming closer to the ground before finally settling. If in the least suspicious, they will at once turn and settle on the open sand, calling loudly all the time, but if their call becomes more subdued until they can scarcely be heard, you may be sure they are on the move, and if a calm night you will hear the pat, pat, pat, of the geese walking over the wet sand, until they reach the grass covered marsh.

After feeding during the night, at the first sign of dawn they leave in a body, flying low over marsh and sand until they reach some suitable sand bank, when they rest and perform their toilet. Their habits differ on the return journey ; coming up to feed, they are always calling when on the wing, but on returning they seldom utter a sound. When taking this morning flight on the edge of the marsh or open sand, they do not denote their presence by calling, but if it is a calm, still morning, one may hear a single note or two uttered just before they rise as if under the command of a leader, and in a few moments one can just see a black mass, or their passing denoted by a swift rush of wings. The speed at which they travel during these morning flights is a good deal faster than at any other time. When I first went to Anthorn to study these interesting birds, it was always a pleasure to watch their daily flight up the estuary at high water, pack after pack, until they reached the "Island," when they rested for a time, returning at ebb tide in the company of thousands of Oyster-catchers. I always had for company a little boy. It was a source of delight to him watching these daily flights, which he could recognise at a great distance. His early training in bird life has made him an expert in the habits of Solway birds, especially ducks and geese. He is now one of the best wildfowlers on the Solway—Mr. W. Storey, Anthorn. At the present time one can watch every tide, and very rarely see either Goose or Oyster-catcher come up as far as the "Island." The change in the marsh has been the cause of this altered habit. They can now find a rest-

ing place at high water on the marsh near the Point, the Oystercatchers going to the high marsh on Skinburness, near Grunc Point.

At the period of high tides, when the marshes are covered with water, leaving the marsh grass and creeks brackish for some time, both Barnacle and Grey Lags visit a certain fresh water gutter to drink, where it flows over a bed of boulder clay, both species being very partial to fresh water.

Except during migration, Barnacle do not leave the marsh, but abnormal weather conditions often force them inland, such as severe gales and floods, or long-continued frost. During the severe gale on December 22nd, 1894, a constant stream of Barnacle, Ducks, Oystercatchers, Godwits and other shore birds was driven inland, following the course of the River Eden; many birds passing low over Eden Bridge during the height of the storm. Following this most severe storm it commenced to freeze on December 29th, and continued for some weeks, the marshes being covered with large blocks of ice, which caused Barnacle to seek food inland. Mr. J. Storey saw birds as far inland as Little Bampton, where some were shot.

The decrease of this species has been most marked during the last few years. In looking up my notes I find that in the early nineteen-hundreds there were probably between 400 and 500 on Newton Marsh, no great difference being noted for many years. On March 29th, 1921, I saw about 250, and at the same place the largest lot of Grey Lags I have seen on the Solway marshes, which I roughly counted to about 350.

On October 20th, 1923, two large flocks came to this marsh just before dark—about 250 to 300. On October 7th, 1929, a small party arrived, followed the next day by a larger party, and by November 17th, their number had increased to about 250 birds. On December 12th, Mr. J. Storey saw the largest number he had ever seen on Newton Marsh, which he estimated at about 1,000 birds, but they were only there for two days.

This great influx may probably have come from the marshes on the Scottish side of the Solway, and I have not the least doubt that a regular passage takes place between the two sides of the Firth, in fact this has been proved by the white bird which was reported several times on Newton Marsh at different periods, and at last shot on Bowhouse Merse, Caerlaverock, Dumfries, on January 3rd, 1925, by Mr. J. Wilson, Glencaple. Mr. W. Nichol reports to me that he has seen both Barnacle and Grey Lags crossing the Solway from both sides.

On October 4th, 1931, a small party arrived, and by the end of the week had increased to about 200, but on December 13th, I only saw one lot of about 100 birds. On April 25th, 1931, in company with Major W. M. Congreve and Capt. H. V. Christie, I saw a party of about 70 washing and preening themselves; a very cold day, with strong East wind, and frequent showers of rain. During the night the wind changed to S.W., and J. Storey told me the geese left at 7 a.m., to be followed the next morning by another party.

My latest date is May 13th (1905), when I crept up to a party of four birds feeding on the low marsh near Rockcliffe Marsh point, although one may often see odd ones on the Solway during the summer, probably wounded birds unable to fly the long distance to their summer haunts. During all my excursions on the Solway marshes, I was never fortunate enough to see Barnacle leave for their summer haunts until 1928.

In previous years I was either a few days too early, or more often too late, but at last I had a wish gratified. On April 22nd, 1928, a very fine day, with plenty of sunshine, I arrived at Anthorn early in the morning, where I called on my old friend, Mr. J. Storey. Shortly after dinner, while sitting on the garden wall, out attention was drawn to a pack of Barnacle flying up the estuary, calling incessantly, and alighting on low marsh near Smalley's creek. They commenced to feed at once, calling loudly all the time, Storey remarking that they would probably leave that night or early next morning; they were very excited, a sure sign of their approaching departure. Several small parties arrived during the afternoon, each party being greeted

by the earlier arrivals in full voice. After a time they began to get uneasy, and kept flying backwards and forwards, never settling down, too full of excitement even to feed. Just before 5 p.m. the whole pack rose, and flew East for about a mile, turned, and came back to the starting place. They turned again, repeating the flight, returning again to the same place, and rested for a few minutes. The whole pack then rose, calling loudly, flying East, at the same time reaching a higher altitude than on the previous occasions, broke into two sections, altered direction more N.E., finally bidding good-bye to Long Newton Marsh for their summer haunt in Spitzbergen. There were about 150 or 160 birds in this party.

This short article on one of our most interesting winter visitors would, I think, be incomplete unless something was said about its breeding habits. I am grateful to my friend, Major W. M. Congreve, M.C., M.B.O.U., for the following notes :—

“ It was not until the summers of 1907 and 1908 that reliable information as to the breeding habits and eggs of the Barnacle Goose was obtained by the German Ornithologist, Professor Koenig, who discovered a small colony, and took three nests in Spitzbergen. In 1921, two members of the Oxford University Expedition obtained five nests containing twenty-two eggs (one nest is now in Tullie House). Owing to frost action, the whole surface of Spitzbergen can be described as consisting of loose stones. Needless to say all mountain climbing is extremely unpleasant, not to say dangerous, and it was with feelings akin to despair that we discovered that the colony of 1921 no longer had nests in the easily-reached situation of that year, but were now all on the ends of rotten looking spurs, which ran steeply down from a mountain top to the extreme edge of an unpleasant looking cliff, which rose for some hundreds of feet above the easily-reached 1921 nesting sites we first visited

That Barnacle Geese were present and had nests was soon obvious to us, for we could see birds sitting and standing on the cliff edge, and in a few minutes after coming in sight

of them it was certain that they had observed our presence, and resented the same, for ten birds were soon noisily flying backwards and forwards over our heads, and all sitting and standing birds had disappeared. We afterwards discovered that danger from below, even at a distance, was at once resented by these birds, but danger from above, because unsuspected, had very little effect on them unless an extremely near approach was made. The only thing to do now was to prospect the nest sites from above, and after an exhausting struggle over loose stones, we reached the mountain top, and could look down on the colony, and were able to locate four nests.

The next day we returned with 200 feet of 1½ in. Alpine rope and 100 feet of 1 in. Alpine line. Tying a loop at the end of the rope, and holding same in one hand while my firmly seated companions payed it out, I descended the first 200 feet without much difficulty. On getting to the end of the first 200 feet, I had no more rope, so my companions came down what was a fairly easy place, and again anchored themselves as firmly as the shifting nature of the loose surface would allow, and I started down again, the slope now being much steeper, and in places vertical for a few feet. With no more rope available, my way was barred by a big rock, which, however, did not prove a difficult task to surmount, and on coming to the crest of this rock I peeped over, and had the wonderful experience of seeing my first Barnacle Goose sitting on a nest at close quarters not more than 25 feet from me, surely a fit situation for the lordly Golden Eagle or the stately Lammergeier, but hardly, I would imagine, until I had seen it, a typical nesting site for a clumsy looking goose. I suddenly realised that I had a priceless opportunity of being the first person to photograph a Barnacle goose on its nest, and I took two photographs from the rock top at what I thought to be 25 feet. Then, holding the end of the 1 in. rope which my companions anchored below me, I slid over the top of the rock and on to the terrace.

The goose, in spite of my complete appearance, still sat like a rock, and on getting to what I estimated was 15 feet from her, I took another photograph, but on trying to get nearer for a better position, she made off suddenly before I was able to snap her flying. The nest contained four eggs, and was simply a neat, round hollow, lined with down and feathers.

One may be left to imagine how Barnacle Geese get their young to the sea in the down covered stage of development. It can only be presumed that the parents push them over the cliff edge, and that they fall so lightly, owing to their thick covering of down, that they do not suffer in the process."

CUMBERLAND ACULEATE HYMENOPTERA.

BY GEORGE B. ROUTLEDGE, F.R.E.S.

The order of insects known as Hymenoptera is one of the largest and most important of the insect world.

Included in it are the Ichneumon flies, which are parasites on other insects; the Saw flies, mostly vegetable feeders; and the Ants, Bees and Wasps, collectively known as the Aculeata, which form the subject of the present paper.

The colonies of some of the Ants sometimes consist of thousands of individuals. The Wood Ant (**F. rufa**) forms a conical nest of pine needles which in time becomes of enormous size. Its nests have a special interest to entomologists, as they harbour many other species of insects which are seldom found elsewhere.

Among the Bees perhaps the large Humble Bees are the most generally familiar, but there are also many smaller bees, which, like the **Bombi**, live in colonies, while others are more or less of solitary habits.

The Yellow Black-banded Stinging Wasps (**Vespidæ**) are not numerous in species, but there are many other Wasps with varied habits which prey on flies, spiders, caterpillars, etc., which they store in burrows in sandy ground, or in rotten wood and bramble stems as food for their larvae.

The present list of Cumberland Aculeata must only be looked upon as a preliminary one. Comparatively little work has been done in collecting the group, and doubtless many more species remain to be discovered. The extensive coast sandhills offer an almost unworked area to the collector, while many of the sheltered valleys of Lakeland are promising ground.

In drawing up this list, I have made use of the records from Cumberland in T. J. Bold's Catalogue of Northumberland & Durham Aculeate Hymenoptera in the Transactions of the Natural History Society of those counties, Vol. III., 1868-70; also of F. H. Day's list in the Victoria History of Cumberland, published in 1900. Mr. Day has handed me his notes made since that time, and I have also given the results of my own collecting in the east of the county over a long period of years.

HETEROGYNA. (Ants).

FORMICIDAE.

This section is composed of the Ants, whose habits and instincts place them very high in the scale of insect life. They nearly all form communities, consisting of males, females and workers. The males and females are almost always winged, but in some species the males are apterous (or wingless), the workers are always apterous. The mating of the male and female is known as the marriage flight, and at times large numbers are seen on the ground. The female then loses her wings, or has them removed by the workers. Such females are described as "deallated" females.

Formica rufa, L. Very local in Cumberland, but abundant in Ashness Woods, near Keswick. Also inhabits a wood near Caldbeck in considerable numbers, and has been reported from Bassenthwaite. It has not been found in the northern part of Cumberland (F.H.D., also in Victoria History). Also at Keswick (G.B.R.). [Locally common in Northumberland and at Grange-over-Sands, Lancashire].

F. fusca, L. Tarn Lodge and Hayton Moss, &c. (G.B.R.). Occurs in all parts of Cumberland in which I have collected. Often found nesting in pine stumps which are in a state of decay (F.H.D.).

F. pratensis, Retz. Lodore, Derwentwater, by Wheeler ('British. Ants,' by Donisthorpe, p. 269).

Donisthorpea fuliginosa, Latr. Taken West of Gilsland (T.J.B., N. & D. Trans., iii., p. 143).

- D. nigra**, L. (*Lasius niger*, L.). Hayton Moss (G.B.R.). Very common on the coast sandhills, in gardens, etc., in the Carlisle district, and doubtless elsewhere in the County. Often enters houses and forms colonies under the floors; also at Silloth, Keswick and Great Salkeld (F.H.D.).
- D. flava**, F. (*Lasius flavus*, De G.). Locally common, forming mounds in dry, sandy ground, on which frequently the wild Thyme grows luxuriantly. Baron Wood, Bannerdale, Borrowdale, Silloth (F.H.D.).
- [**D. aliena**, Först. The record of this species given in the Victoria History of Cumberland must be deleted, as the insect was wrongly determined.]

PONERIDAE.

- Ponera punctatissima**, Roger. In this species the male is apterous (wingless), as is the worker; the female is winged. Taken in Cumberland at Nunwick and Great Salkeld, by H. Britten, in a hot house ("Brit. Ants" Donisthorpe, p. 72 and 74).

MYRMICIDAE.

- Formicoxerus nitidulus**, Nyl. The male of this species is also apterous (wingless). Found in Ashness Wood, Keswick, in the nests of *Formica rufa*, (F.H.D., also recorded in "Brit. Ants, Donisthorpe, p. 84).
- Leptothorax acervorum**, F. Tarn Lodge (G.B.R.). Locally common under stones and in moss, at Orton, near Carlisle, it is particularly common. Cumrew Fell, in the Pennines, at Wan Fell, between Lazonby and Penrith (F.H.D.). (Recorded in Victoria History, and in "Brit. Ants," Donisthorpe, p. 150).
- Myrmica ruginodis**, Nyl. Tarn Lodge, Hayton Moss (G.B.R.). Common in Cumberland, Orton, Cummersdale, Keswick, Seascale, Durdar and elsewhere. Many winged specimens taken on the summit of Saddleback (2,847 feet), on October 5th, 1925, and confirmed by Mr. Donisthorpe (F.H.D.). Recorded in Victoria History.

- M. laevinodis**, Nyl. Under stones and in rotting tree stumps, Eden Valley at Great Salkeld, Carlisle district and Mungrisdale (F.H.D.). Cumberland ("Brit. Ants," Donisthorpe, p. 112).
- M. scabrinodis**, Nyl. Hayton Moss (G.B.R.). Orton, Great Salkeld and St. Bees (F.H.D.). Victoria History.
- M. lobicornis**, Nyl. One specimen at Orton, March 11th, 1900. (Victoria History). It is, however, common in small communities under stones on the dry lower slopes leading into Bannerdale, in the Saddleback country (F.H.D.). Lanercost, in Cumberland, one specimen (T.J.B., N. & D. Trans. iii., p. 144). Near Carlisle (Victoria Hist.), and Saddleback, by H. Britten ("Brit. Ants," Donisthorpe, p. 137).

INTRODUCED SPECIES.

Monomorium pharaonis, L. Very common in flour mills and confectionery works in Carlisle. This is a cosmopolitan ant, which has been diffused by commerce all over the world (F.H.D.). Carlisle (Victoria History and "Brit. Ants," Donisthorpe, p. 98). It was first recorded in London, in 1828.

Camponotus (Myrmothrix) abdominalis, F. Mr. Donisthorpe writes in his "Brit. Ants," p. 349: "Mr. H. Britten gave me workers also taken amongst bananas, at Penrith, Cumberland, in 1906 (J. V. Smith)." Its habitat is in Central and S. America.

FOSSORES.

This section embraces a number of very diverse forms, whose habits differ very much in the various genera. They all provide their larvae with animal food, such as caterpillars, spiders, etc. They only have males and females, and no workers.

MUTILLIDAE.

Myrmosa melanocephala, F. Near Naworth (T.J.B., N. & D. Trans. 111., p. 145).

POMPILIDAE.

- Psammochares (Pompilus) plumbeus**, F. Abundant on the sand-hills of the coast in July, Silloth and Seascale (F.H.D.). Victoria History.
- P. niger**, F. Naworth and Lanercost (T.J.B., N. & D. Trans. iii., p. 146).
- P. approximatus**, Sm. Seascale, 7., vi., 1912, scarce (F.H.D.). Irthingside, a little to the west of Gilsland (T.J.B., N. & D. Trans., iii., p. 146). East Cumberland, in July, a female (T.J.B., E.M.M., iv., p. 226). Also recorded by E. Saunders, (E.M.M., xxxvi., p. 51, and xlii., p. 152).
- P. spissus**, Sch. Wan Fell, 2, vii., 1911 (F.H.D.).
- P. gibbus**, F. Carlisle, one specimen in 1905 (F.H.D.).
- Priocnemis (Salius) exaltatus**, F. Wan Fell, 2, ix., 1900; Port Carlisle, 6, viii., 1917 (F.H.D.). Wan Fell in Victoria History.
- P. (S.) fuscus**, L. **sepicola**, Sm. Naworth and Lanercost, end of June (T.J.B., N. & D. Trans., iii., p. 146).
- P. (S.) parvulus**, Dhlb. Wan Fell, 2., vii., 1911 (F.H.D.).
- Agencia hircana**, F. Keswick, taken by Marshall (Saunders' Acul. Hymen. p. 73). Cumberland (E. Saunders, E.M.M., xxxiii., p. 177).
- Hypsiceraeus (Ceropales) maculatus**, F. Durdar, August 11th, 1901 (F.H.D.).
- Pemphredon lethifer**, Schuck. Orton, 14, vi., 1912; Seascale, 7, vi., 1912 (F.H.D.).
- Passaloeus monilicornis**, Dbm. At Wallholme, East Cumberland four males entered the cracks in a gate-post in July (T.J. Bold, E.M.M., iv., p. 227; also recorded in Saunders' Acul. Hymen, p. 99, and N. & D. Trans., iii., p. 151).
- Mimesa (Psen) bicolor**, F. Two specimens at Wan Fell, 14, vii., 1901 (H. Britten). Carlisle district, no date (F.H.D.).

Gorytes mystaceus, L. Tarn Lodge, Cowran Railway Banks, Gelt Wood, in June (G.B.R.). Wreay, 29, vi., 1913; Orton, 10, vi., 1900; Todhills, 17, vi., 1900; Kirkbampton, 15, vi., 1900; Burgh-by-Sands (F.H.D.). Victoria History.

Nysson spinosus, F. Kirkbampton, 16, vi., 1900; Wreay, 16 vi., 1928 (F.H.D.). Lanercost, June and July (T.J.B., N. & D. Trans., iii., p. 147). Carlisle (Victoria History).

Mellinus arvensis, L. Tarn Lodge, Hayton Moss, in August. This species provisions its nest with large flies, such as *Calliphora erythrocephala* and *C. vomitoria*, &c. It was interesting to watch **M. arvensis** stalking the flies when settled on the large leaves of *Polygonum*, the wasps were very cat-like in their movements (G.B.R.). Great Salkeld, 3, ix., 1900; Wan Fell, 2, ix., 1900; Silloth, 6, viii., 1900; Drigg (F.H.D.). Victoria History.

M. sabulosus, F. Scarce at Silloth (F.H.D.). Victoria History.

Crabro tibialis, F. Tarn Lodge, one specimen, 3, vii., 1900 (G.B.R.). Victoria History.

C. clavipes, L. Great Salkeld, June, 1911 (F.H.D.). Makes its nest in dead bramble stems.

C. cetratus, Schuck; **melanarius**, Bold. Plentiful near Lanercost, breeding in decaying wood, provisioning its nest with small **Diptera**, in July (T.J.B., N. & D. Trans., iii., p. 149). Lanercost (Saunders' Acul. Hymen, p. 131).

C. varipes, Lep. Tarn Lodge, 24, vii., 1916; 3, viii., 1917; 21, vi., 1917 (G.B.R.). Cumwhitton Moss, 2, vii., 1918 (F.H.D.). Lanercost, July (T.J.B., N. & D. Trans., iii., p. 149).

C. dimidiatus, F. Tarn Lodge, 28, vi., 1915; 14, vi., 1918; (G.B.R.). Cumberland, July (T.J.B., N. & D. Trans., iii., p. 148).

C. cribrarius, L. Our commonest species, July and August. Tarn Lodge, &c., (G.B.R.). Kirkbampton, v., 1900; Great Salkeld, 29, vi., 1900; Durdar, 11, vii., 1901; Orton, 28, vii., 1901. In abundance at Drigg in 1922 (F.H.D.). Victoria History. Makes its burrows in the ground.

- Blepharipus (Crabro) capitosus**, Schuck. Tarn Lodge, female, 14, vi., 1918 (G.B.R.). Cumwhitton Moss, 2, vii., 1918 (F.H.D.).
- B. leucostomus**, L. Upperby, 7, vii., 1900 ; Stanwix, vi., 1918 ; (F.H.D.). Victoria History. Nests in decayed wood, preys on a small metallic Dipteron (L. E. Hope).
- Crossocerus (Crabro) carbonarius**, Dhlb. Several specimens at Durdar, 12, vi., 1920 ; Sowerby Row, 5, vi., 1922 ; see note in E.M.M., 1928, pp. 52-53 (F.H.D.).
- C. palmipes**, L. Tarn Lodge, one specimen, 15, vii., 1915 ; another, a female, 14, vi., 1918 (G.B.R.). Carlisle, viii., 1918 (F.H.D.).
- C. varius**, L. Several on Cumwhitton Moss, 2, vii., 1918 (F.H.D.).
- C. anxius**, Wesm. Durdar, 12, vi., 1920 (F.H.D.).
- C. elongatulus**, V. d. Lind. Tarn Lodge, 18, viii., 1902, 5, vi., 1918 (G.B.R.). Wreay, 6, vi., 1911 (F.H.D.). Lanercost, June and July, recorded as **C. luteipalpis**, Schuck (T.J.B., N. & D. Trans., iii., p. 149).
- Ablepharipus (Crabro) podagricus**, V. d. Lind. One specimen, Carlisle District (F.H.D.). Lanercost, July (T.J.B., N. & D. Trans., iii., p. 149). Victoria History.
- Clytochrysus (Crabro) chrysotomus**, Lep. Edmond Castle (G.B.R.). Great Salkeld, 29, vi., 1900 ; Upperby, 7, vii., 1900 ; Orton, 2, vi., 1901, 14, vi., 1919 ; Cumwhitton Moss, 2, vii., 1918 ; Durdar, 5, vii., 1919 ; on or about dead trees (F.H.D.). Victoria History.
- Solenius (Crabro) vagus**, L. Durdar, 14, vii., 1901 ; 9, vi., 1920 (F.H.D.).

DIPLOPTERA.

VESPIDAE.

This group includes the family of Social Wasps. The **Diploptera** may be known scientifically by having their wings longitudinally folded when at rest. The community consists, with the exception of one species, of males, females and workers. The males may be known by their longer antennae, which are

shorter in the females and workers, and the male *possesses no sting*, only the reproductive organs ; males are seldom seen in the house, unlike the females and workers. The females (Queens) only survive the winter, the males and workers having died off during the autumn. We have seven species in the British Isles of which six occur in Cumberland ; three of the species make subterranean nests, two outside in trees and bushes (called *Blebs* by the local inhabitants), but occasionally they nest underground. For the distinction of these yellow and black species, we must look mainly at the clypeus (face), and the first segment of the abdomen. **V. vulgaris**, **rufa**, **norvegica** and **austriaca** have an anchor mark on the face. **V. germanica** carries in the workers a central black stripe stretching only part of the way down the face, and two black dots placed triangularly with the free end of the stripe. In the males and females there are usually three black dots, placed triangularly without a black scribe at all. **V. sylvestris** has only a black dot in the centre of the face, or, in the females, often no black markings at all. **V. norvegica** and **V. rufa** have rusty stains around the black spots of the abdomen. The most reliable difference is in the compound eyes, in the latter species they are continued to the base of the jaws, but in the former do not extend so far, and **V. sylvestris** also agrees with **V. norvegica** in this respect.

Vespa vulgaris, L. Common in Cumberland ; its nests are underground.

V. germanica, F. Tarn Lodge (G.B.R.). Less common than the preceding, Carlisle district, Great Salkeld, Penrith and Seascale (F.H.D.) ; its nests are underground.

V. rufa, L. Tarn Lodge, Faugh, Heads Nook (G.B.R.). Durdar, Orton, Cumwhitton Moss, Great Salkeld, Wan Fell, not at all scarce (F.H.D.) ; its nests are underground.

V. austriaca, Panz. ; **arborea**, Sm. Orton, Great Salkeld, a number of males and females taken in both localities (F.H.D.). Females common about Lanercost (T.J.B., N. & D. Trans., iii., p. 153). Carlisle and Lazonby district (Victoria History). This species has no worker ; it occurs in the nests of **V. rufa**.

.V sylvestris, Scop. Tarn Lodge and Castle Carrock (G.B.R.). Fairly common at Orton, Durdar, Penton, Great Salkeld and Birdoswald. Makes large nests in bushes, etc.; in 1922 several underground nests found in hedge banks at Gaitsgill, near Carlisle (F.H.D.).

V. norvegica, F. Tarn Lodge, Hayton Moss, occasionally nests underground (G.B.R.). A common species, nests sometimes found on heather as well as in various bushes. Carlisle, Orton, Cumwhitton Moss, Great Salkeld (F.H.D.).

(NOTE.—The Hornet, **Vespa crabro**, L., is sometimes reported by the local inhabitants, but they have invariably mistaken the Queens of the other species, as they are larger than the workers. **V. crabro** does not occur in Cumberland).

EUMENIDAE.

Only males and females.

Odynerus (Hoplomerus) spinipes, L. Tarn Lodge (G.B.R.). Seascale, St. Bees, Burgh-by-Sands, Durran Hill, Durdar. In the last locality I have found its burrows, with their curved, tubular entrance, in plenty on a hard, clayey bank (F.H.D.).

O. (Ancistrocerus) parietum, L. Tarn Lodge (G.B.R.).

O. (A.) pictus, Curt. Tarn Lodge (G.B.R.). Port Carlisle, Great Salkeld, Lazonby, not uncommon (F.H.D.). Victoria History.

O. (A.) trimarginatus, Zett. Tarn Lodge, 26, vi., 1918 (G.B.R.). Gaitsgill, 19, vi., 1916, scarce (F.H.D.). Cumberland (T.J.B., N. & D., Trans., iii., p. 152).

O. (A.) parietinus, L. Tarn Lodge (G.B.R.). Burgh-by-Sands, Cumwhitton Moss, Carlisle, in gardens, not uncommon (F.H.D.). Victoria History.

O. (A.) Antilope, Panz. Burgh-by-Sands, scarce (F.H.D.). Victoria History.

ANTHOPHILA. (Bees).

SUBD. 1. OBTUSILINGUES.

COLLETIDAE.

- Colletes glutinans**, Curt. ; **succincta**, L. Sandy places on heaths, common at Port Carlisle, August, 1917 ; Great Salkeld, by H. Britten, 10, viii., 1904 (F.H.D.).
- C. fodiens**, Kirby. On ragwort at Silloth, 22, vii., 1900 ; Drigg. vii., 1921 (F.H.D.). Victoria History.
- C. marginata**, Sm. Cumberland, recorded by F. Smith (Saunders Acul. Hymen, p. 178). Victoria History.
- C. Daviesana**, Sm. Silloth, 22, vi., 1901, two specimens (F.H.D.). West of Gilsland (T.J.B., N. & D., Trans., iii., p. 156).
- Prosopis (Hylaeus) confusa**, Nyl. Orton, two specimens, 8, vii., 1900 (F.H.D.). Victoria History.
- P. (H.) brevicornis**, Nyl. ; **minutus**, F. Durdar, one specimen, 26, viii., 1900 (F.H.D.). Victoria History.

SUBD. II. ACUTILINGUES.

ANDRENIDAE.

The species of the genus **Sphecodes** are associated with various species of **Halictus**.

- Sphecodes monilicornis**, Kirby ; **subquadratus**, Sm. Warwick Moor, September 17th, 1917 (G.B.R.). Found in association with **Halictus rubicundus**, Chr., and **H. cylindrus**, F., common, Upperby, Heads Nook, Cummersdale and Great Salkeld (F.H.D.).
- S. divisus**, Kirby ; **similis**, Wesm. Tarn Lodge, one specimen, June 3rd, 1900 (G.B.R.). Victoria History.
- S. ferruginatus**, Schk. Orton, in fair numbers, 10, vi., 1900, occurs with **Halictus rubicundus** (F.H.D.). Victoria History.

- S. crassa**, Th. ; **variegatus**, v. Hag. Orton, 10, vi., 1900 ; Fingland, 22, v., 1921 ; rather scarce (F.H.D.). Victoria History.
- S. affinis**, v. Hag. Great Salkeld, taken by H. Britten, 1, vii., 1904 (F.H.D.).
- Halictus rubicundus**, Chr. Tarn Lodge, May, August and September (G.B.R.). A common species on sandy heaths and dry hedge-banks, Durdar, Orton, Blackwell, Kingmoor, Cummersdale, Sour Nook, Great Salkeld, Ullswater (F.H.D.). Victoria History.
- H. quadrinotatus**, Kirby. Great Salkeld, June, 1904 (F.H.D.).
- H. laevigatus**, Kirby ; **lugubris**, Kirby. Naworth, in July, rare (T.J.B., N. & D., Trans., iii., p. 157).
- H. calceatus**, Scop. ; **cylindricus**, F. Common, May, June and August, Tarn Lodge (G.B.R.). Common on *Veronica*, &c., Orton, Durdar, Kingmoor, Wreay, Burgh-by-Sands, Great Salkeld, &c. (F.H.D.). Cumberland (T.J.B., N. & D., Trans., iii., p. 157).
- H. albipes**, Kirby. In June and August, at Tarn Lodge (G.B.R.). Carlisle in flowers of Coltsfoot, 12, iii., 1918 ; Cumwhitton Moss, 2, vii., 1918 ; Great Salkeld, 8, v., 1900 ; Durdar, 18, v., 1918 ; Orton, 19, v., 1898 (F.H.D.). Victoria History.
- H. subfasciatus**, Nyl. Great Salkeld, June, 1904 ; Kirkbampton, Orton, 15, iv., 1924 (F.H.D.).
- H. freygeessneri**, Alpk. Tarn Lodge, 27, viii., 1915 ; 3, viii., 1917 ; Cumwhitton Moss, female, 20, v., 1918 (G.B.R.). Orton, 13, viii., 1905 (F.H.D.).
- H. villosulus**, Kirby. Lanercost, females not uncommonly in July (T.J.B., N. & D., Trans., iii., p. 157).
- H. nitidiusculus**, Kirby. Wreay, 25, viii., 1900 ; 27, v., 1900 ; Upperby, in dandelion flowers, 5, v., 1901 ; Orton, 16, v., 1919 (F.H.D.). Victoria History.
- H. minutus**, Kirby. Orton, 26, v., 1900 ; 11, v., 1911 (F.H.D.). Victoria History.

- H. rufitarsis**, Zett.; **atricornis**, Smith. Tarn Lodge, a female, 5, v., 1918 (G.B.R.). Durdar, a scarce species, 7, iv., 1918 (F.H.D.).
- H. tumulorum**, L. Tarn Lodge, one specimen, 26, v., 1916 (G.B.R.). Durdar, 30, vii., 1904; Orton, 19, viii., 1899; and 13, viii., 1905; Todhills and Great Salkeld, a common species on various flowers (F.H.D.). Victoria History.
- H. Smeathmanellus**, Kirby. Tarn Lodge, a female, 29, vi., 1918 (G.B.R.). Carlisle, 10, v., 1912 (F.H.D.).
- H. morio**, F. Lanercost, in July (T.J.B., N. & D., Trans., iii., p. 157).
- H. leucopus**, Kirby. Tarn Lodge, one specimen, 1, vi., 1900 (G.B.R.). Todhills, 19, vi., 1900; Durdar, 7, viii., 1911 (F.H.D.). Victoria History.
- Andrena albicans**, Kirby. Tarn Lodge, &c., (G.B.R.). Very common in spring on sallow bloom and flowers of dandelion. Newby Cross, Orton, Durdar, Kingmoor, Great Salkeld (F.H.D.). Victoria History.
- A. jacobii**, Perk.; **trimmerana**, auct. Tarn Lodge, 5, v., 1918 (G.B.R.). Common in spring. How Mill, 20, v., 1900; Blackwell, 5, v., 1901; Upperby, Orton, Cross Fell, Baron Wood, 28, v., 1911 (F.H.D.). Victoria History.
- A. cineraria**, L. Tarn Lodge, 11, vi., 1900; 3, vii., 1917; 5, vi., 1918 (G.B.R.). Lanercost (T.J.B., N. & D., Trans., iii., p. 158). Victoria History.
- A. fulva**, Schr. Tarn Lodge, several specimens, all females, in May (G.B.R.). Upperby, 3, v., 1930, burrowing in hard paths, rather scarce (F.H.D.). Newby East, one female, by Miss D. Stewart. Rosehill (H. Lonsdale).
- A. Clarkella**, Kirby. Cumwhitton Moss, 20, v., 1918 (G.B.R.). At sallow bloom, fairly common, Kingmoor, 14, iv., 1900; Milton, 24, v., 1900; Easton, 11, v., 1900; Orton, 11, v., 1911; Durdar, 18, v., 1920 (F.H.D.). Victoria History.

- A. nigroaenea**, Kirby. Tarn Lodge, May, 1917 and 1918 (G.B.R.). Locally common, Upperby, 21, iv., 1900; Orton, 19, v., 1900; Newby Cross, St. Bees, May, 1918 (F.H.D.). Victoria History.
- A. Gwynana**, Kirby. Tarn Lodge, May, 1918 (G.B.R.). Kingmoor, 4, viii., 1900; Kirkbampton, 5, v., 1900; Wan Fell, 2, vii., 1911; Great Salkeld, vi., 1904; Sour Nook, 11, v., 1919; Drigg, vii., 1921 (F.H.D.). Cumberland, April and May (T.J.B., N. & D., Trans., iii., p. 158). Victoria History.
- A. bicolor**, F., second brood, Hayton Moss, July 26th, 1900, and July, 1918 (G.B.R.). West of Gilsland, in flowers of *Campanulae*, in July (T.J.B., N. & D., Trans., iii., p. 158).
- A. varians**, Rossi. Kingmoor, 26, v., 1917 (F.H.D.).
- A. helvola**, L. Hayton Moss, 8, vii., 1916 (G.B.R.).
- A. lapponica**, Zett. Cumwhitton Moss, female taken, 28, v., 1918 (G.B.R.). Orton, August 5th, 1899, towards sunset, females on *Vaccinium* (F.H.D., E.M.M., xxxvi., pp. 88-89; E.M.M., xlii., p. 203). First recorded British males were taken at Orton, in 1899 (E.M.M., xxxvi., p. 88). Victoria History.
- A. fucata**, Sm. Tarn Lodge, male, 19, v., 1918; female, 23, vi., 1918 (G.B.R.). Langwathby, 25, v., 1900; Wreay, 27, v., 1900; Blackwell, 24, vi., 1900; Durdar, 18, v., 1918; Cumwhitton Moss, 2, vii., 1918 (F.H.D.). Victoria History.
- A. nigriceps**, Kirby. Tarn Lodge, 1, viii., 1900; 3, viii., 1917; 15, vii., 1918 (G.B.R.). On ragwort at Silloth, 22, vii., 1900, two specimens, one of each sex (F.H.D.). Victoria History.
- A. fuscipes**, Kirby. Common on heather at Wan Fell, 2, ix., 1900; 28, ix., 1912; the 1900 specimen was erroneously recorded in Victoria History as **A. tridentata**, Kirby (F.H.D.).
- A. denticulata**, Kirby. Tarn Lodge, July and August, 1917 and 1918 (G.B.R.). Carlisle, recorded by F. Smith (Saunder's Acul. Hymenoptera, p. 252). Victoria History.

- A. bucephala**, Steph. ; **longipes**, Sm. Lanercost and Gilsland, not uncommon in July (T.J.B., N. & D., Trans., iii., p. 159).
- A. cingulata**, F. Abundant on Speedwell flowers, Upperby, 5, v., 1901 (F.H.D.). Lanercost, in July (T.J.B., N. & D., Trans., iii., p. 158). Victoria History.
- A. chrysosceles**, Kirby. Wan Fell, 2, vii., 1911 (F.H.D.).
- A. analis**, Panz ; **tarsata**, Nyl. Cumwhitton Moss, 30, vi., 1917 ; Tarn Lodge, 26, vi., 1918 (G.B.R.). Orton, 16, vii., 1899 ; 8, vii., 1900 ; 29, vii., 1918 (F.H.D.). In a lane leading northwards from Naworth Railway Station, and at Lanercost, July (T.J.B., N. & D., Trans., iii., p. 160). Near Naworth Castle, July, 1867 (T.J.B., E.M.M., iv., p. 284). Victoria History.
- A. coitana**, Kirby. Hayton Moss, 19, vii., 1900 ; Tarn Lodge, August, 1917, and July 19th, 1918 (G.B.R.). Great Salkeld, 29, vii., 1900 ; Durdar, 30, vii., 1918 ; Wan Fell, 2, vii., 1911. Gilsland and Lanercost, males frequent flowers of *Campanulae*, females on wild rose (T.J.B., N. & D., Trans., iii., p. 160). Cumberland (Saunders's Acul. Hymenoptera, p. 260). Victoria History.
- A. albicrus**, Kirby ; **sericea**, Chr. Tarn Lodge, very common on garden paths, throws up little hillocks of sand, occurs in May, July and August (G.B.R.). Great Salkeld, 29, vi., 1904 ; Orton, 14, vi., 1912 ; Upperby, 21, v., 1916 ; Durdar, 18, v., 1918. Abundant in burrows on hard paths by the River Pctteril, at Upperby, in May and June (F.H.D.). Victoria History.
- A. minutula**, Kirby. Gelt Wood, 10, vii., 1900 (G.B.R.). Orton, 8, v., 1900 ; Wreay, June, 1901 ; Upperby, 11, v., 1911 ; Wan Fell, 2, vii., 1911 (F.H.D.). West of Gilsland, in June (T.J.B., N. & D., Trans., iii., p. 160). Victoria History.
- A. saundersella**, Perk. ; **nana**, Sm. Durdar, 30, vii., 1899 ; 9, vi., 1920 ; Orton, 12, vi., 1904 (F.H.D.). Victoria History under **A. nana**, Sm.
- A. proxima**, Kirby ; **Collinsonana**, Kirby. Lanercost, in July (T.J.B., N. & D., Trans., iii. p. 161).

A. Wilkella, Kirby. Tarn Lodge, female stylopized, May 26th, 1916; a male, June 7th, 1918 (G.B.R.). Wreay, 27, v., 1900 (stylopized); Bowness Moss, 27, v., 1912; St. Bees, v., 1919; Upperby, 2, vi., 1918 (F.H.D.). Victoria History. Stylopized specimens are var. **convexiuscula**, Kirby.

A. Afzeliella, Kirby. Gilsland and Lanercost in June (T.J.B., N. & D., Trans., iii., p. 160).

Cilissa leporina, Panz. St. Bees (P. J. Barraud. Entom., xl., p. 67, insect was determined by E. Saunders).

The members of the genus **Nomada** are waspish looking insects, in their black and yellow uniform. They enter the nests of the **Andrena** species, and after the latter insects have filled their cells with food, the **Nomada** lays an egg in it.

Nomada obtusifrons, Nyl. Tarn Lodge, vii., 1900, and viii., 1917 (G.B.R.). Naworth Castle, July, 1867, recorded under **N. xanthosticta**, Kirby, and **N. mistura**, Sm. (T.J.B., N. & D. Trans., iii., p. 161).

N. tormentillae, Alf. ; **Roberjeotiana**, Panz. Orton, 8, vii., 1900; Durdar, 12, vi., 1920; Great Salkeld, 29, vi., 1900; Wan Fell, 2, vii., 1911 (F.H.D.). Victoria History.

N. marshamella, Kirby; **alternata**, Kirby. Tarn Lodge, in May, Heads Nook Station many specimens in 1931 and 1932 (G.B.R.). Common, Lazonby, 20, v., 1900; Wreay, 27, v., 1900; Blackwell, 12, v., 1911; Orton, Durdar, Kingmoor, Cumwhitton Moss, Drigg, Silloth, Burgh-by-Sands (F.H.D.). Cumberland, in May and June (T.J.B., N. & D., Trans., iii., p. 162). Victoria History.

[**N. fucata**, Panz. Ambleside, in Westmorland (Saunders's Acul. Hymen., p. 287). This has not yet been recorded in Cumberland.]

N. ruficornis, L. Gelt Wood, 20, vi., 1900; Tarn Lodge, 4, vi., 1918, flying among flowers of Barbery (G.B.R.). Todhills, 17, vi., 1900; Orton, 10, vi., 1900; Gelt Wood, 23, vi., 1900 (F.H.D.). Victoria History.

- N. bifida**, Thoms. Tarn Lodge, May, 1900, May and June, 1918 (G.B.R.). Orton, 10, vi., 1900 ; Great Salkeld, 3, vi., 1904 ; Durdar, 19, v., 1918 (F.H.D.). Victoria History.
- N. leucophthalma**, Kirby ; **borealis**, Zett. Taken in company with **Andrena Clarkella**, Kirby. Great Salkeld, 27, v., 1900 ; Wreay, 7, v., 1911 ; Kirkbampton, Orton, 23, iv., 1912 ; How Mill, 16, v., 1914 ; Kingmoor, 18, v., 1919 (F.H.D.). Cumberland (T.J.B., N. & D., Trans., iii., p. 161). Victoria History.
- N. hillana**, Kirby ; **ochrostoma**, Kirby. Great Salkeld, 17, vi., 1900 (F.H.D.). Lanercost, in May and June (T.J.B., N. & D., Trans., iii., p. 161). Victoria History.
- N. flavoguttata**, Kirby. Orton, 10, vi., 1900 ; Wreay, 30, v., 1900 ; Baron Wood, 9, vi., 1901 ; Great Salkeld, 29, vi., 1904 (F.H.D.). Victoria History.
- N. furva**, Panz. Cumberland in June (T.J.B., N. & D., Trans., iii., p. 162).

APIDAE.

Coelioxys mandibularis, Nyl. From Carlisle, specimens received by Frederick Smith (Entom., iv., 1868, p. 4 and 6).

The species of **Osmia** make their nests in old posts, snail shells, stems of brambles, key-holes, etc.

Osmia rufa, L. Upperby, 5, v., 1902 ; Durdar, 18, v., 1918 ; common at Kingmoor, 18, v., 1919 (F.H.D.).

[**O. parietina**, Curt. ; **angustula**, Zett. Ambleside, Westmorland (E. Saunders, E.M.M., xxxvi., p. 53, and Acul. Hymen., p. 334). Not yet been taken in Cumberland.]

O. coerulescens, L. Two specimens at Durdar, June 9th, 1920 (F.H.D.).

The species of **Megachile** make their nests in old posts, stumps of trees, dead wood, etc., and line them with pieces of leaves or flowers. Rose bushes in gardens often have semi-circular pieces cut out of the leaves by these bees.

Megachile Willughbiella, Kirby. Great Salkeld, 18, viii., 1901 ; In gardens, Carlisle, vii., 1924 ; 2, ix., 1928 (F.H.D.).

- M. circumcincta**, Lep. Tarn Lodge, female, June 10th, 1918 (G.B.R.). Several at Drigg, in 1920-21-22 in each year in July, (F.H.D.).
- M. centuncularis**, L. Carlisle, July, 1918, and in June, 1919, a number bred from burrows in rotten wood (F.H.D.).
- M. versicolor**, Sm. Carlisle, Smith (Saunders's Acul. Hymen., p. 327). Victoria History.

The genus **Psithyrus** resemble the Humble Bees, (**Bombus**) they have only males and females. Structurally the genus is almost identical with **Bombus**, but the posterior tibiae are devoid of any polliniferous arrangement of hairs, and the upper surface of the abdomen is shiny, and has not the thick coat of **Bombus**. The females hibernate during the winter, and in the spring they search for the nests of the **Bombi**, as soon as they find a nest sufficiently advanced with workers they kill the Humble Bee Queen, and lay their own eggs in the nest. The larvae feed as parasites on the stores of food provided by the **Bombus** host.

- Psithyrus rupestris**, F. Cumwhitton Moss, 10, v., 1919; Orton, 22, iv., 1900, 12, v., 1913; Easton, 11, v., 1907 (F.H.D.), Cumberland, common (T.J.B., N. & D., Trans., iii., p. 168). Victoria History. This species is parasitic on **Bombus lapidarius**, which it greatly resembles.
- P. vestalis**, Fourc. Mentioned in Victoria History, but I have no specimens (F.H.D.). Common in Cumberland (T.J.B., N. & D., Trans., iii., p. 168). Parasitic on **B. terrestris**.
- P. bohemicus**, Seidl.; **distinctus**, Perez. Common, Tarn Lodge, Cairn Bridge, etc. (G.B.R.). Blackwell, Cummersdale. Durdar, Orton, Anthorn, Cumwhitton Moss, Pooley Bridge, Easton (F.H.D.). Parasitic on **Bombus leucorum**.
- P. campestris**, Panz. Tarn Lodge (G.B.R.). Rather scarce, Orton, Anthorn, females only. Attached to **B. muscorum**, and according to Smith with **B. hortorum** and **Latriellellus**.
- P. sylvestris**, Lep.; **quadricolor**, Auct. Tarn Lodge, male, June 15th, 1900 (G.B.R.). Scarce, Great Salkeld, Cumwhitton Moss (F.H.D.). Victoria History. Associated with **B. pratorum** and **Jonellus**.

The other British species, **P. barbutellus**, Kirby, nec Smith, has not been found in the county, although its host, **Bombus hortorum**, is very common here.

The genus **Bombus** (True Humble Bees) are social species, living in communities, and consist of males, females and workers; the females are considerably larger than the males and workers. The females only survive the winter. The males possess no sting. Mr. F. W. L. Sladen divided the genus into (1) Pollen Storers, which store the pollen in cells detached from the larvae, (2) Pocket Makers, which place pollen in cells attached to the clusters of larvae. This second group is sub-divided into (a) Pollen Primers, comprising four long-tongued species, which lay their eggs in cells primed with pollen, and dwell under the ground; (b) Carder Bees, which dwell, as a rule, on the surface of the ground, and lay shorter and rounder eggs than the other species. The **Bombi** are beneficial insects, and of economic importance for fertilising the numerous flowers they frequent. In consequence of the absence of Humble-bees in New Zealand, it was found that the red clover did not produce seed freely. In November and December, 1884, a number of females were sent from England to that country, with the result that two species, **B. terrestris** and **B. ruderatus**, have become established there, and the red clover now yields a plentiful crop of seed.

Bombus muscorum, L.; **Smithianus**, White. Orange Brown, Carder Bee. Tarn Lodge (G.B.R.). Fairly common, Burgh-by-Sands, Kirkbampton, Drumburgh, Orton, Kingmoor, Newton Reigny Moss, Bowness Moss (F.H.D.). Victoria History.

B. solstitialis, Pz.; **venustus**, Sm.; **helferanus**, Seidl. Carder Bee. Scarcer than the last, with which it may be confused. Orton, Durdar, Kingmoor, Gaitsgill, Drigg (F.H.D.). "I have seen a good number of males feeding on the heather on the Cumberland Moors in August." (T.J.B., N. & D., Trans., iii., p. 165, under **B. senilis**, Sm.).

- B. agrorum**, F. Tawny yellow, very variable. Carder Bee. Tarn Lodge, Hayton Moss (G.B.R.). Very common, Kingmoor, Warwick, Orton, Southwaite, Wreay, Cummersdale, Armathwaite, Nunnery Walks, Silloth, Penrith (F.H.D.). Victoria History.
- B. distinguendus**, Mor. Dusky yellow or greenish yellow, with a dark band across the middle of the thorax. Pollen-primer. Tarn Lodge, three females, June 1918 (G.B.R.). Scarce, Silloth 22, vii. 1900; Durdar, 3, viii., 1901; Cummersdale, 14, viii., 1921 (F.H.D.). Victoria History.
- B. hortorum**, L. Black, yellow bands in front and back of thorax, white tail. Pollen-primer. Common on rhododendron at Tarn Lodge (G.B.R.). Common, rather local, Kingmoor, Cummersdale, Orton, Durdar, Drigg (F.H.D.).
- B. jonellus**, Kirby. Colouring very like the last, smaller insect. Pollen-storer. Scarce, one female in Carlisle in 1899 (F.H.D.). Victoria History.
- B. pratorum**, L. Black, yellow band across thorax, also on second segment of abdomen, tail tawny. Pollen-storer. Very common on Cotoneaster flowers, flowering currants, etc., at Tarn Lodge (G.B.R.). Very common on bramble, raspberry and loganberry, Gelt, Orton, Durdar, Blackwell, Cumwhitton Moss, Southwaite, Thurstonfield, Bowness Moss, Caldbeck (F.H.D.). Victoria History.
- B. lapponicus**, F. Thorax black, with yellow bands in front and back, red tail. Pollen-storer. Locally common in high districts. Castle Carrock Fell, 28, v., 1918, Tarn Lodge (G.B.R.). High Pike, 16, vi., 1901; Cumrew Fell, 11, vi., 1912; Cumwhitton Moss, 1, vi., 1918; Saddleback, 4, vi., 1922; Geltsdale, 29, iv., 1923; Armathwaite, 2, viii., 1926 (F.H.D.). Victoria History.
- B. sylvarum**, L. Prevailing colour greenish-white, often with a yellowish tinge. Carder Bee. Scarce, Durdar, 26, v., 1918; Blackwell, 11, v., 1919; Kingmoor, 24, v., 1921; Carlisle, 30, vii., 1921; Cummersdale, 14, viii., 1921 (F.H.D.).

B. ruderarius, Müll. ; **Derhamellus**, Kirby. Black, with red tail, male also has yellow bands in front and back of thorax. Hairs on pollen basket or *Corbicula* red. Carder Bee. Scarce, several at Tarn Lodge (G.B.R.). "Not uncommon about Lanercost, and very abundant about Carlisle, where I was told by the late Mr. T. C. Heysham it became the common red-tailed species to the exclusion of **B. lapidarius**." (T.J.B., N. & D. Trans., iii., p. 166). Victoria History.
 Note.—This is not the experience of present day observers, **B. lapidarius** being the common red-tailed species.

B. soroensis, F. Black, yellow band in front of thorax, yellow band on abdomen, interrupted in the middle, white tail. Tarn Lodge, several specimens (G.B.R.). Scarce, one female at Orton, 21, iv., 1919 (F.H.D.). Carlisle, taken by T. C. Heysham (Saunders's Acul. Hymen., p. 378). Victoria History.

B. lapidarius, L. Black, with red tail, male has yellow band round thorax. Hairs on Pollen basket or *Corbicula*, black, Pollen-storer. Common where I have collected (G.B.R.). Durdar, Orton, Kingmoor, Warnell Fell, Broadfield, Great Salkeld, Silloth, Bowness Moss, Seascale, Drigg (F.H.D.). Victoria History.

B. terrestris, L. Black, yellow bands on thorax and abdomen, tawny tail. Pollen-storer. About 30 females at Tarn Lodge (G.B.R.). Not very common, Kingmoor, 14, iv., 1900; Durdar, 19, v., 1918; 3, vi., 1921; 26, vii., 1922; Cummersdale, 29, viii., 1922 (F.H.D.). Victoria History.

B. leucorum, L. Like the last, smaller, yellow bands more of a lemon colour, white tail. Pollen-storer. Very common (G.B.R.). Common at Orton, Kingmoor, Durdar, Wetheral, Warwick, Drumburgh, Drigg, Seascale, St. Bees, Thurstonfield, Keswick, Great Salkeld, &c. (F.H.D.). Victoria History.

There are three other species of Humble Bees in the British list, viz. :—

B. cullumanus, Kirby ; **harrisellus**, Kirby (**runderatus**, F.), and **latreillellus**, Kirby. These have not occurred in Cumberland.

Apis mellifica, L. Honey Bee. Not found wild in the County. The Beekeepers have other races, such as Italian Race, native of N. Central Italy, Carniolan race, etc.

CHRYSIDIDAE.

This is a group of Parasitical Hymenoptera numbering in the British Isles some 23 species, so far we have only one recorded from the County ; the species are parasitic on genus **Odynerus**.

Chrysis ignita, L. Ruby-tailed Wasp. Tarn Lodge, about buildings (G.B.R.). Gelt, Orton, Kingmoor, Brampton, &c. (F.H.D.).

This is a brilliant metallic bluish-green insect with a very fiery red abdomen.

THE ROE DEER IN CUMBERLAND.

BY RITSON GRAHAM.

To the present day student of this county's fauna, and of the literature appertaining thereto, there undoubtedly will exist some regret and disappointment at the paucity of matter relative to this, our most interesting and attractive wild animal. The scant recognition accorded *Capreolus capraea* by our county faunalists of the past is, in the light of the animal's historic and, one may add, prehistoric status, most difficult to account for. This neglect probably justifies the present attempt, inadequate though it be, to place on record some account of the Roe Deer's past and present distribution, and to accord it a more appropriate position in the annals of local natural history than it has hitherto enjoyed.

In the catalogue of Cumberland animals contributed to Hutchinson's History of Cumberland (1794), by Dr. John Heysham (1753—1824), no mention is made of the Roe Deer.

The next county faunal survey is Macpherson's monumental work, The Vertebrate Fauna of Lakeland (1892), wherein the author treats the Roe Deer fairly liberally, but chiefly historically, confining his remarks almost entirely to the Naworth Castle stock; treating the few cited occurrences of the species elsewhere as being merely strays from that estate. In his later summary of Cumberland's fauna, Macpherson requotes in the Victoria History, Vol. I. (1901), the incident of Roes being sent from Naworth to London in 1623, with the additional information that, "a few still exist in the Naworth district," and that others visit the Netherby estate from the Scottish borders. Single stragglers, he adds, having been known to occur as far south as Penrith. In an excellent paper (read 1905) on the "Mammals of the Eden Valley," and published in Vol. I of this Society's

Transactions (1909), Mr. H. Britten continues to speak of the few Eden Valley Roe Deer as stragglers, but states that it was then supposed that several had taken up their quarters in the Coomb Woods, near Armathwaite.

The foregoing briefly summarises all the county records contain concerning one of our largest indigenous existing mammals, which, in the light of present day knowledge is, I venture to suggest, either quite inadequate or our native Roe Deer have increased and spread during the last 30 years to an extent which must be almost unprecedented in the annals of British Mammalia. Actual fossil remains of the Roe Deer unearthed in Cumberland are rare, or non-existing, or more likely not recognised and recorded, and we do not meet with evidence of the animal's early occurrence here except in cave-earth deposits and Romano-British sites. The Roe's great antiquity, however, is well established by the fossil remains found elsewhere in Britain, such fossilized bones and antlers as have been found being identical with those of the existing species, and of the earliest known antlers the type Capreoline is the earliest, antlers of most Pliocene Deer being of this type, which resemble most those of our present day Roe, and as Professor Owen remarks :—" The little Roebuck, like the Red Deer, appears from its fossil remains to have continued to exist from the prehistoric post-pliocene times to the present period,"* and most authorities agree with Sir Harry Johnston's statement that :—" the earliest type of antlered deer to reach Britain seems to have been the Roe, a persistent and an archaic form of Cervine."† Thus our present day Roe have outlived the long extinct Elk and Reindeer in Britain, and to a great extent the feral herds of Red and the doubtfully indigenous Fallow Deer. From the few Cumberland and Westmorland limestone caves and caverns examined for their mammalian remains, notably those at Grange over Sands and Helsfell, Kendal, amongst the finds generally regarded as post-pliocene, the Roe is there represented contemporary with such extinct species as *Bos longifrons*, Wolf, Bear, Boar and Wild Cat.

* Paleontology, p. 409.

† British Mammals, pp. 290-91.

Concerning excavations conducted on the Roman Wall and adjacent Romano-British sites, J. Collingwood Bruce states that "the bones of animals, *i.e.*, the Red Deer, the Roebuck, an extinct Ox, the Wild Boar and Sheep are frequent,"* these remains being in many instances the kitchen refuse of the Roman and British garrisons.

Despite the general distribution of the Roe Deer throughout the wooded parts of Cumberland, which during the early historic period was very considerable, our place names reveal little association with the resident deer, indeed the only one I can find free from suspicion of latter day corruption is Roe Head, a sequestered hamlet at the foot of Ullswater, and in Westmorland. We have, it is true, a series of place names prefixed with Roe in the valley of a stream in Mid Cumberland now bearing that name, *i.e.*, Roe Wath, Roe Bank, Roe Hill, and Roe House, but these are obviously called after the stream, which originally was not Roe but Raghe, latterly spelt Raugh, a word which Denton asserts signified running.†

Evidence of the existence of Roe Deer in the ancient and Royal forests of Cumberland, *i.e.*, Inglewood and Allerdale during Norman times is scanty and quite overshadowed by the numerous references in the Forest Charters and Pleas, &c., to the larger Red Deer, that the occurrence of the Roe during this favourable period is generally overlooked and even doubted. Yet the Roe is not only listed as a Royal beast of the chase, but in the Pleas of the Forest, held in Edward the First's time, there is recorded more than one conviction for killing a Roe, and if the forest law of William I., enacted in 1087, still prevailed, the offenders were liable to be deprived of their eyes; this drastic penalty applying to "those guilty of killing a stag, *roebuck*, or wild boar."‡

* The Handbook to the Roman Wall (8th Edition), p. 102.

† Estates and Families in Cumberland, 1610.

‡ Inglewood Forest, T. H. M. Parker, M.A., Cumb-West. Arch. and Ant. Soc. Trans., Vol. v. (New Series), p. 35.

Indicative of the local occurrence and protection afforded the Roe from the 11th to the 13th century, as embodied in the Royal Forest Charter, we find brief but conclusive reference worded as follows:—"Moreover they say that the King (Henry III.) has, in the Forest of Auredale (Allerdale), hart and hind, the boar and the Roe," and the beasts to which the King was entitled in the Forest of Allerdale were the Hart, Hind, Boar and Roe.*

It would appear that with the breaking up of the Royal Forests, and the great expansion of reclamation which immediately followed, the widely distributed Roe Deer became fewer, and were gradually pushed northward. So intense was this process that before the middle of the 16th century, the animal was absent from most of the Midland and Southern English Counties. Leyland, who wrote about the year 1538, testified that the Roe was still common in the North of England, remarking that "In Northumberland, as I heare say, be no forest except Chivit Hills, and there is great plenty of redde deare and *row bukkes*."

In 1618, and again in 1633, occurred those now classic incidents of the conveying of Roe Deer from Naworth Castle, in Cumberland, to the Royal Park of Charles I., at Wimbledon. In 1633, 32 young Roes were carted from Naworth to the Metropolis under the care of six men and seven horses, the price paid for capturing the young animals being approximately five shillings per head. From about this time to comparatively recent years the question of the continued existence of the indigenous Roe Deer in England and Wales became speculative, most writers on British Mammals following each other in speaking of the last of the race of English Roe, and generally treating the species as extinct South of the Scottish border. As a matter of fact the Roe never became extinct in England, but has uninterruptedly continued to occupy the woodlands of Cumberland from those prehistoric days when its progenitors roamed precisely the same ground, but under the somewhat different conditions of those remote times, though there is no doubt that but for the Roe Deer's ancient strongholds in Cumberland it would at this period have ceased to be an English species.

* Ibid.

Some of the best early twentieth century authorities recognise this fact, as, for example, the statement of Sir H. Johnston's :—" There are said to be still a few indigenous Roe living in parts of Cumberland, descended from the old English stock, but elsewhere in England the Roe became extinct early in English History."* and also that of J. G. Millais :—" As a matter of fact the Roe never became extinct in England, Naworth, in Cumberland, has always been a favourite home of the Roe, and they are there to this day."†

The opinion of 19th century naturalists in their writings concerning the exact status of the Roe Deer in Cumberland and the North of England generally, appears confused and uncertain. This state of things continued right into our own time, and is not even yet entirely dispelled.

Macpherson himself, apparently conscious of this uncertainty concerning the existence and distribution of the Cumbrian Roes, wrote in the " Zoologist," as follows :—" The presence of the Roe Deer in Cumberland having been doubted in some quarters for lack of published information, it becomes desirable to state that a limited number are established near Wigton, not Netherby, in the North of this County. The graceful little deer wander through the largest of our border plantations, occasionally making their appearance in new and unexpected localities. Thus in 1880, a buck, which had no doubt forded the Eden, took up its abode in the Cotehill Woods, where it was frequently seen for two years,"‡

Whilst thus definitely confirming the continued existence of the Roe Deer in Cumberland, at a time when it was practically extinct elsewhere, Macpherson's remarks do not, however, do

* British Mammals (1903), p. 299.

† The Mammals of Great Britain and Ireland (1900), Vol. iii., p. 161.

‡ Zool., 1887, p. 382. See also " Zoological Record for Cumb." 1886 (Macpherson and Duckworth) Trans. Cumb.-West. Ass., 1886-87, p.p. 44-5.

justice to the establishment and distribution of the species here at this period, and his statement apparently gave occasion for Harting's remarks two years later, *i.e.*, "Suffice it is to say that with the exception of Cumberland, where a limited number are established near Wigton. . . . the Roe can only be looked for in any number beyond the Scottish borders."*

I personally find it difficult to accept the establishment of the Roe Deer anywhere near Wigton, where no extensive woodlands exist, then or now, especially at a time when, according to the same authorities it was practically extinct elsewhere in the County.

But the former writer is not at all good to follow, especially when he continues with : "The resident Roe's (which are believed to be aboriginal with fresh importations a few years since) maintain their numbers steadily, but there is no marked increase." As a result of careful inquiry, I can find no evidence to suggest that Roe Deer were ever introduced into Cumberland, and that towards the close of the 19th century, say from thirty to fifty years ago, the Roe was not in any sense a rare animal in the county but was restricted to certain old established haunts where the species had been in existence in all probability continuously from time immemorial. The Naworth and Netherby coverts, and the Eden Valley woodlands on both sides of the river between Armathwaite and Lazonby, including Baron Wood and the Coomb Wood, as well as High Stand and Cuddy Wood, nearer Cotehill, are the best authenticated of these ancient haunts. These habitations, moreover, became the nucleus from which a remarkable expansion in distribution and increase of the species occurred (and is still in progress) during the last thirty years. This exceptional increase in the usually very consistent status of the Roe Deer received a great impetus during the European War period (1914-1918), when many of the creature's oldest haunts were invaded by wood-cutters and their huts and saw-mills. This wholesale disturbance, whilst not banishing the deer entirely, caused them to extend their territory, and to visit distant coverts,

* Zool., 1889, p. 82.

where they found the much desired peace and security, and stayed. Many of these newly-occupied haunts, though perhaps less extensive than the animal's Eden Valley headquarters, were otherwise admirably suited to the Roe's requirements, and were merely awaiting the overflow of the species, which, in consequence of its gradual increase, would take place sooner or later. The arrival of the tree-fellers, and the subsequent disappearance of large sections of these strongholds was but the forceful expulsion of what would eventually have been a more natural and gradual expansion of the species. The presence of the Roe in the Thurstonfield and Orton coverts is directly attributable to this period, as is its notable increase in the Sebergham and Rosley districts.

Following the redistribution of the war years, the Roe, now confronted with fresh fields and pastures new, continued to prosper and extend its area of occupation. This process, which is still proceeding, I have watched locally with great interest, and I find that the dispersal, in the main, radiates from the Eden Valley, and follows generally the valleys of our smaller streams to, in many instances, as far as tree growth permits. After crossing narrow belts of country usually intersected by woodlands, the wandering Roe soon find themselves in one or other of our many naturally wooded stream valleys; these they explore in both directions, as well as the woodlands on either flank, and finally become established at the most suitable locality in the vale. This procedure has occurred in the case of the Caldew, Petteril and Gelt Valleys admirably, and similarly with the Cairn and Irthing, in each instance the first occupation has been at a point in direct woodland communication with the place of origin. A further sub-dispersal, as it were, to suitable haunts and lesser stream, or tributary valleys adjacent is also occasionally undertaken; a not unexpected circumstance in view of the creature's continued increase and the general suitability of the conveniently situated environment. The present distribution of the Roe Deer in Cumberland is therefore in a constant state of flux, and can only be defined tentatively, and with this necessary provision I attempt the following outline,

In the Lakeland portion of Cumberland the Roe Deer is generally absent, and I can find no evidence to suggest that it ever occupied the ancient forests of Ennerdale and Copeland, nor of its more recent presence in the richly wooded Ullswater neighbourhood.*

In 1895 a pair of Roe appeared in the Greystoke Park coverts, and by 1901 the number there had increased to five, three fawns were later observed in the most solitary parts of the park, but only one of these survived, the others "got in the way of hounds." It was subsequently deemed necessary to shoot the remaining Roe, owing to damage done to young trees, and during the winter of 1903, three adults were killed. Thus terminated this march of the Roe Deer Lakelandwards.

In West Cumberland where industry replaces ruralness, the Roe is not a permanent resident. Therefore we have the real home of the species confined to mid, east and north Cumberland, which I would describe in further detail, as follows :—

Taking the middle reaches of the River Eden as a central point, with the Naworth and Netherby estates as outlying bases, I find the Roe has extended its range south and west, via the valleys of the Petteril and Caldew, and their tributaries, almost to Greystoke in the first named direction, and to just beyond Westward in the latter. Studholm Rigg and Bolton Park, west of the Wigton—Caldbeck Road, appear to constitute the extent of the animal's range in the west, though Westward and Nineghylls immediately east of these coverts hold a fair number of Roe; the last-named having had its pair or so for upwards of thirty years.† Dentonside, between Sebergham and Caldbeck, is also a well-known haunt of the Roe.

* This does not apply to the Westmorland and Lancashire portion of the Lake district, as I have reason to believe the numerous Roe Deer now frequenting the Furness Fells and the wooded region on either flank of Windermere Lake, are of native stock, and in conjunction with their Cumbrian congeners survived the fate of the English Roe Deer elsewhere.

† I am indebted to Miss Parkin, Woodlands, and Mr. Brockbank, Bolton Park, for particulars and confirmation of facts relative to the Roe Deer in this district.

From the Caldew Valley the tributary Roe,* has been penetrated to Skelton and Lamonby, and the many woodland glens on either side of this small stream now contain their pair or so of deer. Middlesceugh Wood, Purdham, Farley and School Ghylls are comparatively recently occupied haunts here. Broadfield, an extensive and well-wooded country, is not yet occupied by the Roe Deer. The timber here is chiefly coniferous, and not so attractive to the species as woods of deciduous trees. South of Penrith, including the Lowther estate, the Roe is but a wanderer, the predominance of coniferous woodland in this direction again probably being the reason, but down the valley of the River Petteril, from Penrith to Carlisle, and the sandstone uplands immediately east of here, viz., Wan Fell, Lazonby, Blaze and Barrock Fells, the Roe is firmly established. Lazonby and Wan Fells would probably be occupied in conjunction with the neighbouring Eden Valley strongholds, though the Roe Deer's presence in the lower reaches of the River Petteril, *i.e.*, Barrock, Wragmire, Wreay and Newbiggin Woods is of recent occurrence.

Passing now beyond the Eden Valley, where we know the Roe has been a native since early historic times, to East Cumberland, we at once merge into another ancient haunt of the species in the Naworth Castle estate. At both of these ideal haunts the animal is at present a common inhabitant. The Naworth gamekeepers declare that, despite frequent shooting to prevent undue increase, the Roe is everywhere present, and maintains a constant status, though not so numerous now as fifty or sixty years ago.

The woodlands of Lanercost, Walton and the Irthing Valley generally are excellent Roe Deer haunts. On one occasion I observed eleven deer in Walton Wood. On the River Gelt I find the Roe established as far into the fells as wood or coppice will reasonably allow; the creature's range in this direction also includes the woodlands of Edmond Castle and about Cowran; Corby, Wetheral and Cumwhitton districts also provide some good Roe Deer country. The country intervening between the

* Formerly Raugh. See Footnote, p.106.

Naworth zone and the Netherby estate contains, here and there, its several pairs of Roe, and from Blackford to Hethersgill I am able to trace the regular occurrence of this Deer. That very thickly wooded belt of country following the valley of the River Liddle, through the Riddings to Penton, evidently received its few Roe from the Netherby coverts. Solway Moss terminates the range of the animal in this direction, where, some years ago, I found the skeleton of a fine buck in one of the many self-sown Scots Pine woods. In the upper Solway area the Roe Deer is at present in a process of transition from a casual wanderer to a permanent resident. The woodlands of Castletown and Todhills are frequently visited, though not yet occupied; whilst the Thurstonfield and Orton coverts always provide a few Roes to distract the foxhounds which regularly hunt there.* To Watch Tree and Wiggonby I can trace the Roe, though I cannot yet find any evidence of its presence about Crofton. Westward from here to Wigton, and beyond to the coast, with the exception of Brayton, there is little suitable Roe Deer country, consequently none have been observed. Still pursuing a circuitous belt of country, with the Eden Valley as a hub, we now enter into the haunts of the species at Westward and Sebergham, from where we commenced. The area thus encompassed comprises the regular, as distinct from the occasional, habitat of the Roe Deer in Cumberland, as I find it at the moment of writing.

The Roe is, at certain seasons, notably in early spring, a great wanderer, and can then be met with at places far removed from any of the above-mentioned haunts. I possess some interesting notes concerning these nomadic Roes. Mr. G. Bolam has met with the species in the Alston neighbourhood, strays from South Northumberland or North-east Cumberland. Moorland gamekeepers and others have reported seeing odd Roe in such unlikely country as Spadeadam and Butterburn Wastes. The industrial area of West Cumberland, and the bare fell slopes

* It is interesting to note the recent occurrence of a pair of Roe Deer on the Kingmoor Nature Reserve, and to recall Macpherson's remarks of 40 years ago, viz.: "A strayed Roe frequented Kingmoor, near Stanwix, for several months in 1883."

of the Westmorland Pennines can occasionally be visited by wandering Roe Deer; but such instances, whilst interesting in themselves, are no indication of the animal's distribution in the county.

Space forbids a detailed account of the engaging habits of this most elegant of creatures which have come to my notice from time to time, and a few brief remarks will have to represent the many pleasant and profitable hours spent in the company of the Roe and in its beautiful environment. I find our native Roe Deer show a decided preference for woods of mixed trees; an oak wood is probably preferable to any; Naworth provides an ideal home in this respect. During the winter months the Roe seek the more sheltered parts, and enter the coppice and thickets of the valleys and glens, but during the hot summer days even the open woodlands are not cool enough. On such occasions the deer lay out in beds of bracken or rushes on the heaths and meadows adjoining, where frequently I have almost fallen over their chestnut tinted forms. I have likewise roused individuals from fern-shaded hollows in disused quarries and from jungle-like growths of tall bracken surrounding a fallen tree.

I can perhaps best sum up the food of the Roe Deer as consisting of all things green, though they are most particular in their feeding, picking up the best and most tender morsels obtainable. In early spring I find much scraping at fern clumps for the curled fronds on the corms of, chiefly, the various Buckler and Shield ferns. There is no food problem during nine months of the year, but in winter every green thing is eagerly sought; this, incidentally, is the period of greatest wandering.

Roe Deer are seen further from home during the first three months of the year than at any other time, the quest for food, in my opinion, being the principal propelling force. There are few prettier countryside sights than that of a pair of slender-limbed Roes sedately plucking the woodland greenery as they leisurely, and with much grace, browse unconcernedly through some dim-lit woodland glade. The tips of Bramble and Wild Raspberry are nibbled with avidity, whilst such unconsidered trifles as the green mosses on fallen trees are not overlooked.

Outside the rutting season, the cry of the Roe is seldom heard, being used only at other times under stress of great emotion. I have encountered parent Roes with their offspring when the anxiety exhibited by one or other of the adults was most intense and distressing, but no sound escaped the frenzied parent.

The care and affection bestowed upon the fawns by their parents is well known, and is often responsible for some interesting, even amusing, incidents. On one occasion I found a doe unceremoniously hustling a cur dog—which had strayed too near her week-old fawn—out of her domain ; this entailed the crossing of a stream, and, reluctant or otherwise, the dog promptly plunged into the water, and was as promptly followed by the enraged doe. On another occasion I met, in an open space in the wood, a fine buck ; we both instantly stood still, he gazing hard in my direction. It was the time of fawns, and I suspected a family near, the buck's uneasiness and subsequent strange behaviour confirmed my suspicions. He presently commenced to move his head at varying angles, as though intent in seeing all round me ; up, down, and to either side, he peered in a most amusing manner, but his legs never moved, the body lunged to and fro in response to the movements of the neck, as though held in sockets by the feet. The longer I stood the more intense became his antics ; he at length laid down and even turned away, but only momentarily, always resuming the anxious gaze and uneasy actions as before. This particular buck's whole action was obviously the result of pent-up anxiety, not for his own welfare, but for that of his precious offspring, though as yet no other deer had been seen by me. The sequel came when the youngster, for whose benefit this elaborate display had been shown, " let the cat out of the bag," as it were, by galloping playfully in my direction. Eventually the doe appeared, and I, having now observed all I was likely to, relaxed my stiffened limbs and walked off.

Though comparatively free from the ravages of predatory enemies, the Roe Deer is subject to many parasitic pests, which circumstance, in conjunction with the few mortally wounded by shooting, will account for those we so frequently find dead, and

in various stages of decomposition, in almost every haunt of any extent. The Liver fluke is occasionally prevalent, particularly in those deer frequenting the damper woods.

Though shy and retiring, the Roe can overcome these instinctive traits to a remarkable extent, especially in localities where roads or much used paths occur. I have watched a pair await their opportunity to cross a busy highway between passing motors, and have frequently quietly passed within a stone's throw of undisturbed feeding animals.

Roe Deer are very methodical in their comings and goings, their well-trodden paths in many of our woodlands bespeak this, and their adherence to routine was well exemplified when I witnessed a troop of five advance in single file to the top of a steep bank above the River Eden. Their intention was to cross the river and a level ford-like crossing was to the right of the high bank, but the latter was the animal's regular route, so sliding down 25 or 30 feet of clay bank here they entered the water, and waded belly-deep to the further side.

In conclusion, I sincerely trust that all who are able will give to the Roe Deer that protection and appreciation which it so richly deserves at the hands of all who profess a love of the beauties of nature, and a regard for our native fauna.

**FURTHER ADDENDA TO "THE COLEOPTERA OF
CUMBERLAND," published in Vols. I., II., III., and IV.**

By FRANK H. DAY, F.R.E.S.

(READ 30TH. MARCH, 1933).

Since the publication of my notes on Cumberland Beetles in former volumes of these Transactions, further investigation has resulted in the addition of 17 species to the County list: the number now recorded totalling 1837 species. The nomenclature followed in the present contribution is that of the last British Catalogue by Sir T. Hudson Beare, 1930. Except where otherwise stated, the records are my own. In addition to notes on the species new to the County, I am giving notes on a number of species previously considered to be rare or local in Cumberland which have since been met with more plentifully.

NEW TO CUMBERLAND.

CARABIDAE.

Bembidion gilvipes, St. Sparingly in flood refuse by the River Caldew, in Carlisle. Owing to the close resemblance in the field of this species to others of the genus **Bembidion**, it may have been overlooked previously, and is possibly not so uncommon as we think.

Bembidion redtenbacheri, Dan. By the River Gelt, May 10th, 1902. See my notes in the "Naturalist," 1930, p. 231.

HALIPLIDAE.

Haliphus fluviatilis, Ab. Occurs in the River Petteril near Upperby, but is not common. Mr. Routledge has it from Edenhall, 13, v., 1906, ex. coll., Britten.

DYTISCIDAE.

Deronectes depressus, F. Talkin Tarn, not uncommon.

NOTE.—The localities given in Vol. II., p. 203, for this species (with the exception of Talkin Tarn) refer to **D. elegans**, Pz., which is the common stream species. **D. depressus**, F., is much more local, and confined to lakes and tarns.

Agabus melanarius, Ab. Cumwhinton, May 8th, 1909 (E.M.M., 1924, p. 260). Omitted from Vol. IV. Apparently rare, as I have not been able to find it again.

GYRINIDAE.

Gyrinus natator, L. The type form has occurred on Newton Reigny Moss to Mr. H. Britten and myself. Previous records from Cumberland refer to the var. or sub-species **substriatus**, S., which is the common form here (see E.M.M., 1931, p. 195, where Mr. J. Omer-Cooper discusses the question of **G. natator**, L., and its allies in detail).

STAPHYLINIDAE.

Aleochara discipiens, Mt. Keswick, March 30th, 1920, one specimen in flood refuse (T. H. Beare, E.M.M., 1929, p. 40).

Atheta longicollis, Mt. Orton, June 14th, 1924, scarce.

Alianta incana, Er. Orton, 1931, abundant in dead stems of the reed mace (*Typha latifolia*).

Tachinus pallipes, Gr. Gelt Woods, September 5th, 1910, sparingly in putrid fungi.

Staphylinus caesareus, G. One specimen on the wing in Carlisle, August 25th, 1931.

COCCINELLIDAE.

Anisostica 19-punctata, L. Newton Reigny Moss, on reeds and other aquatic plants, in August, 1932, a short series.

COLYDIIDAE.

Cerylon ferrugineum, S. Two specimens under bark, Wreay,
February 2nd, 1930.

NITIDULIDAE.

Meligethes obscurus, Er. On willow herb by the River Caldew,
near Holme Head, May 22nd, 1930.

ELATERIDAE.

Elater nigrinus, Hb. One specimen in Gelt Woods (E.M.M., 1928,
p. 235).

CURCULIONIDAE.

Apion cruentatum, Wa. Recorded from Longtown and Todhills
by Mr. James Murray (Naturalist, 1930, p. 340).

Dorytomus dejeani, Fst. Orton, on aspen in June, rare.

The six following species have been recorded in former
Vols., but owing to recent changes in nomenclature, require to
be amended in accordance therewith :—

CARABIDAE.

Dyschirius luedersi, Wagn. Recorded under **D. aeneus**, Dj. I
have it from Burgh Marsh and Thurstonfield,
(see E.M.M., 1933, p. 151, for notes on the
characters of the two species).

HYDROPHILIDAE.

Philydrus fuscipennis, Th. Recorded as **P. melanocephalus**, Ol.
(See E.M.M., 1915, p. 322).

STAPHYLINIDAE.

Staphylinus (Ocypus) globulifer, Fc. Recorded as **O. morio**, Gr.

Staphylinus (Ocypus) aeneocephalus, D.G. Recorded as **O. cupreus**,
Rossi, which has not yet been taken in Cumber-
land, and appears to be a southern insect.

Scopaeus abbreviatus, M.R. Recorded as **S. sulcicollis**, S.

CURCULIONIDAE.

Gymnetron veronicae, Germ., and var. **nigrum**, Walt. Recorded as **G. beccabungae**, L. The type occurs at Orton, but is rare. The var. is fairly common there and also occurs at Kingmoor, Newton Reigny Moss, Wreay, and in the Irthing Valley.

Additional notes on species previously considered to be rare or local in Cumberland :—

CARABIDAE.

Dyschirius nitidus, Dj. Kirkbride, Anthorn, Newton Marsh.

Dyschirius angustatus, Ah. On mudbanks near Kirkbride, at times abundant in burrows of *Bledius atricapillus*, Gm.

Amara eurynotata, Pz. Several fine examples near Armathwaite, August 2nd, 1926 .

Amara lucida, Df. Abundant in the Drigg sandhills.

Bembidion varium, Ol. Kirkbride.

Bembidion pallidipenne, Il. Seascale, Drigg.

Asaphidion (Tachypus) pallipes, Df. By the River Wampool, at Kirkbride, common.

Epaphius (Trechus) secalis, Pk. River Caldew, near Cummersdale.

Demetrias atricapillus, L. Common in the Seascale sandhills.

HALIPLIDAE.

Haliphus confinis, S. Common in Talkin Tarn, also in the boating pond in Upperby Park.

Haliphus nomax, Bw. Not scarce, Upperby Park, Thurstonfield, River Petteril at Woodbank, var. **browneanus**, Sh., also occurs.

DYTISCIDAE.

- Hyphydrus ovatus**, L. Upperby Park, common.
- Hygrotus (Coelambus) 5-lineatus**, Zt. Common in streams and large ponds, Holme Head, Upperby Park, Cumwhinton, &c.
- Coelambus confluens**, F. Sellafield, July 9th, 1917 (Murray).
- Deronectes assimilis**, Pk. Carlston, two specimens (Routledge).
Abundant in the pond at Upperby Park.
- Deronectes latus**, S. One specimen in a beck near Cummersdale (Wallis, E.M.M., 1914, p. 155).
- Deronectes 12-pustulatus**, F. Bowscale, Upperby Park, Fairy Beck (Near Holme Head).
- Hydroporus angustatus**, St. Cumwhinton brick ponds.
- Hydroporus rufifrons**, Df. Kingmoor, May 27th, 1917.
- Hydroporus melanarius**, St. Kingmoor, June 2nd, 1932.
- Hydroporus obsoletus**, Ab. Thurstonfield, Durdar.
- Agabus paludosus**, F. Durdar scarce, but common at Holme Head in the Fairy beck.
- Agabus conspersus**, Mn. Drumburgh, Rockcliffe Marsh, common.
- Rhantus exoletus**, Fo. var. **nigriventris**, Ny. Blackmoss pool, April 11th, 1931.
- Rhantus bistriatus**, Bg. Blackmoss pool, April 11th, 1931.

HYDROPHILIDAE.

- Hydraena nigrita**, Gm. One in a beck near Cummersdale (Wallis, E.M.M., 1914, p. 155).

STAPHYLINIDAE.

- Aleochara ruficornis**, Gr. Port Carlisle, June 19th, 1915 (Murray).
Cowrigg.
- Aleochara bipunctata**, Er. Buttermere, May, 1912 (W. E. Sharp).
- Ischnoglossa prolixa**, Gr. Durdar, Orton, under bark.
- Ischnoglossa corticina**, Gr. With the last, but scarcer.

- Notothecta flavipes**, Gr. Caldbeck, common in ants' nests.
- Atheta gyllenhali**, Th. Cummersdale, Silloth.
- Atheta hygrotopora**, Kr. Cummersdale, Gelt.
- Atheta incognita**, Sh. Gelt, by the river.
- Atheta coriaria**, Er. Kingmoor, Durdar, in birds' nests.
- Atheta corvina**, Th. Orton, in carrion.
- Atheta macrocera**, Th. Durdar, in dung.
- Atheta pygmaea**, Gr. Wetheral, Orton, in haystacks.
- Atheta laticollis**, S. Kingmoor, taken by sweeping.
- Homolota (Epipeda) plana**, Gy. Carlisle, common under bark.
- Gyrophaena strictula**, Er. Wreay, Durdar, common.
- Encephalus complicans**, W. Orton, June 12th, 1915.
- Hypocyptus laeviusculus**, Mn. Orton, Kingmoor, Newton Reigny, in moss.
- Hypocyptus apicalis**, Br. Silloth, Kingmoor, in moss.
- Tachyporus formosus**, Mt. Durdar, August 15th, 1915.
- Quedius othiniensis**, Jh. In moles' nests, common, Durdar, March 23rd, 1929.
- Quedius scribae**, Gg. (*picipennis*, H.). Carleton, Helvellyn.
- Ontholestes (Leistotrophus) murinus**, L. Anthorn.
- Staphylinus fulvipes**, Sp. West end of Buttermere, May, 1912 (W. E. Sharp).
- Philonthus longicornis**, S. Croglin, May 21st, 1927.
- Philonthus discoideus**, Gr. Carlisle, July 6th, 1923.
- Lathrobium ripicola**, Cw. Cummersdale, Kirkbride.
- Lathrobium multipunctatum**, Gr. River Caldew, in flood refuse.
- Lathrobium angusticolle**, Ld. Great Salkeld (Britten).
- Stenus lustrator**, Er. Carleton, Monkhill.
- Stenus incanus**, Er. By the River Liddell, at Penton, May 24th, 1926.
- Stenus atratulus**, Er. In flood refuse, Cummersdale.

Stenus carbonarius, Gy. In moss, Orton.

Stenus nigrutilus, Gy. Kingmoor, July 4th, 1918.

Bledius longulus, Gr. By the River Wampool, at Kirkbride, common.

Omalius brevicolle, Th. Drumburgh, Cumwhitton Moss, on bones.

SCYDMAENIDAE.

Neuraphes sparshalli, Dy. Carleton, November 2nd, 1913, in grass tufts.

Scydmaenus tarsatus, Ml. Great Corby (G. B. Walsh).

PSELAPHIDAE.

Bythinus burrelli, Dy. Petteril valley, February 7th, 1925.

COCCINELLIDAE.

Adonia variegata, Gz. Common at Drigg, in addition to the type form the abs. **unidecimpunctata**, Schr.; **angulosa**, W.S.; **similis**, Schr.; and **constellata**, Laich, also occur.

Exochomus 4-pustulatus, L. Kingmoor, March 30th, 1929.

NITIDULIDAE.

Librodor (Ips) 4-guttatus, F. In flood refuse, River Petteril, February, 1925.

Rhizophagus parallelocolis, Gy. Common in Carlisle Cemetery.

LATHRIDIIDAE.

Corticaria ferruginea, Mm. (**fenestralis**, L.). Orton, common on birch.

CRYPTOPHAGIDAE.

Henoticus serratus, Gy. Carlisle, July, 1927, a number under oak bark (E.M.M., 1927, p. 209).

Atomaria umbrina, Gy. Nunnery Woods, Cummersdale.

CANTHARIDAE.

Rhagonycha translucida, Kry. (unicolor, Curt.). Gelt Woods, Middlesceugh.

Malthodes guttifer, Kw. Durdar, July 23rd, 1927.

PTINIDAE.

Ptinus tectus, Bo. Carlisle, breeding in gold fish food (ants' pupae). E. Blezard.

LAMIIDAE.

Pogonochaerus hispidus, L. (dentatus, Fc.). Orton, June 13th, 1930.

CHRYSOMELIDAE.

Plateumaris (Donacia) affinis, Kz. Mungrisdale, common on rushes.

Chrysomela fastuosa, Sp. Orton, common in cultivated fields on the hemp nettle (*Galeopsis tetrahit*).

Phytodecta pallida, L. Sebergham (E. M.M., 1928, p. 235).

Batophila rubi, Pk. Middlesceugh, June 19th, 1926.

Dereocrepis (Crepidodera) rufipes, L. Middlesceugh, common.

ANTHRIBIDAE.

Anthribus variegatus, Gf. (*Brachytarsus varius*, F.). Ennerdale, abundant on old thorn bushes, June 5th, 1926.

CURCULIONIDAE.

Rhinomacer attelaboides, F. On Scots pine, Orton, Durdar, Talkin Tarn, Cumwhitton Moss, Stanwix.

Rhynchites cupreus, L. Nunnery Woods, common on the flowers of mountain ash.

Apion subulatum, K. Floriston, Kirkbampton, Wreay, Wan Fell.

Apion loti, K. Kirkbride, Wreay, Birdswald, Great Salkeld, &c.

Otiorrhynchus dubius, Str. (**amurus**, Gy.). Cross Fell, Cumrew Fell, Grisedale Pike, Sty Head, occurs under stones.

Brachysomus echinatus, Bf. Middlesceugh, Gaitsgill.

Tanymecus palliatus, F. Kirkbride, June 2nd, 1928.

Barynotus moerens, F. Gelt Woods, Cummersdale, Easby.

Sitona puncticollis, S. Orton, Wreay, Wan Fell, Seascale.

Orchestes pilosus, F. (**ilicis** F.). Middlesceugh, July 19th, 1924.

Dorytomus longimanus, Fo. (**vorax**, F.). Tarn Lodge, June 23rd, 1919. (Routledge).

Dorytomus tortrix, L. Orton, June 13th, 1930, common on aspen.

Anoplus roboris, Su. Orton, common on alder.

Coeliodes ruber, Mm. Orton, Durdar, on scrub oak.

Ceuthorhynchus cochleariae, Gy. Wreay, Orton, Middlesceugh.

THE LEPIDOPTERA OF CUMBERLAND.

ADDITIONAL SPECIES AND FURTHER RECORDS

By GEORGE B. ROUTLEDGE, F.R.E.S.

In this list of Addenda I have 34 new species taken in Cumberland to record. I am also giving some additional records I have received regarding certain species recorded in the previous four Volumes of our Transactions, and also a few records that we have had to withdraw from Vol. III. The order of sequence of species is similar to that given in previous volumes. I give the names of my contributors. Their initials only are given in the text that follows:—

GEORGE B. ROUTLEDGE, F.R.E.S. (G.B.R.).

F. H. DAY, F.R.E.S. (F.H.D.).

Rev. H. D. FORD (H.D.F.).

NORMAN JOHNSTON (N.J.).

Rev. G. A. K. HERVEY (G.A.K.H.).

NOTE.—The last-named gentleman was Vicar of Buttermere, 1926-31, and is now Vicar of St. Peter's, Bushey Heath, Herts., When in doubt Mr. E. Meyrick verified his captures.

NEW SPECIES TO CUMBERLAND LIST.

SESIIDAE (Clearwings).

Sesia (Aegeria) muscaeformis, Staud. Cat. Two specimens taken at St. Bees, in May, 1919 (H.D.F.).

NOCTUIDAE.

Hydroecia lucens, Frr. Taken once or twice at light and in the open at Thursby (H.D.F.).

Zanclognatha tarsipennalis, Tr. Two or three specimens taken most years since 1921, at light at Thursby (H.D.F.).

PYRALIDES.

Crambus inquinatellus, Schiff. Common among bracken, Buttermere, Matterdale (G.A.K.H.).

TORTRICES.

Penthina (Argyroploce) sauciana, Hb. Locally common on *Vaccinium* at about 2,000 feet, Buttermere (G.A.K.H.).

Spilonota (Notocelia) roborana, Tr. Buttermere (G.A.K.H.).

Euchromia (Argyroploce) mygindana, Schiff. Whiteless Pike (G.A.K.H.).

E. (Argyroploce) arbutella, L. Whiteless Pike (G.A.K.H.).

Paedisca (Eucosma) sordidana, Hb. Scale Woods (G.A.K.H.).

Eucosma trapezana, F. Beaumont, 30, viii., 1929, one specimen (N.J.).

Coccyx (Eucosma) nemorivaga, Tengst. Scale Hill (G.A.K.H.).

TINEAE.

PSYCHINA.

Fumea intermediella, Brd.; **casta**, Pall. Buttermere. Larvae abundant, over 90 per cent. of all I have reared have been females (G.A.K.H.).

TINEIDAE.

Phylloporia bistrigella, Haw. Buttermere (G.A.K.H.).

Swammerdamia griseocapitella, Sta.; **heroldella**, Hb. Scale Woods (G.A.K.H.).

S. oxyacanthella, Dup.; **lutarea**, Haw. Scale Woods (G.A.K.H.).

Depressaria douglasella, Sta. Buttermere (G.A.K.H.).

D. nervosa, Haw. Buttermere (G.A.K.H.).

Gelechia boreella, Dougl. Scale Woods, very dark form (G.A.K.H.).

- Bryotropha (Gelechia) umbrosella**, Zell. Wasdale (G.A.K.H.).
- Argyresthia mendica**, Haw. Wasdale (G.A.K.H.).
- A. arceuthina**, Zell. Locally common at Whiteless Pike (G.A.K.H.).
- A. atmoriella**, Bankes. Scale Woods (G.A.K.H.).
- A. glabratella**, Zell. Common in Scale Woods (G.A.K.H.).
- Coleophora orbitella**, Zell. Buttermere, very common on birch, also feeds on hawthorn, **Vaccinium**, tree trunks, etc. (G.A.K.H.).
- C. vacciniella**, H-S. Two specimens on Scar Craggs at 2,000 feet. This species is new to Britain, and Mr. E. Meyrick is quite clear that that is what it is (G.A.K.H.).
- Elachista subnigrella**, Dougl. Locally common at Red Screes, at 2,500 feet (G.A.K.H.).
- Lithocolletis nigrescentella**, Logan. Buttermere, in water meadows (G.A.K.H.).
- L. oxyacanthae**, Frey.; **pomifoliella**, Sta. Very common at Buttermere (G.A.K.H.). It is smaller and much darker than **Lithocolletis blancardella**, F., which is a synonym of **L. pomifoliella**, Zell. (E. R. Bankes, E.M.M., xxxv., p. 251.)
- L. vacciniella**, Sta.; **junoniella**, Zell. On Whiteless Pike, at 2,000 feet (G.A.K.H.).
- L. spinicolella**, Zell. Common at Buttermere and Rosthwaite (G.A.K.H.).
- L. salicicolella**, Zell, Sirc. Local, very common at Scale Woods (G.A.K.H.).
- Bucculatrix cristatella**, Zell. Matterdale (G.A.K.H.).
- Nepticula oxycanthella**, Sta. Scale Woods (G.A.K.H.).
- N. cryptella**, Sta. Buttermere (G.A.K.H.).
- N. lapponica**, Wocke. Buttermere (G.A.K.H.).
- N. confusella**, Wals. Local, very common at Scale Woods (G.A.K.H.).

FURTHER ADDITIONAL RECORDS.

RHOPALOCERA (Butterflies).

Colias edusa, F. Five specimens taken, and others seen at Kingmoor, near Carlisle, in August, 1933. Has not been noted in Cumberland since 1921 (F.H.D.).

Melitaea aurinia, Staud. Cat. Three specimens on Tarn Lodge Meadow, June 8th, 1930. This meadow, some 20 acres in extent, was formerly a Peat Moss, and on the Waste Lands being divided up by the Act of 1801, was turned into a meadow; there is about a quarter-of-an-acre growing the Devil's Bit Scabious (*Scabiosa succisa*) its food plant. Since 1930 no specimens have been observed (G.B.R.).

Celastrina (Cyaniris) argiolus, L. One male, a tattered specimen, was taken flying in the garden at Tarn Lodge, on June 14th, 1930; the principal localities in the county are Keswick, Lodore and Workington (G.B.R.).

SPHINGES (Hawk Moths).

Smerinthus (Amorpha) populi, L. Common at Wetheral (F.H.D.). Beaumont (N.J.).

S. ocellatus, L. Beaumont (N.J.).

Macroglossa stellatarum, L. Buttermere (G.A.K.H.). Beaumont (N.J.).

Choerocampa (Metopsilus) porcellus, L. Several at Drigg, in the South of the County (F.H.D.). Beaumont (N.J.).

Hemaris tityus, L. ; bombyliformis, Esp. (Narrow-bordered Bee Hawk). Kingmoor, near Carlisle (F.H.D.). Beaumont (N.J.).

BOMBYCES.

Nola confusalis, H-S. At Durdar on tree trunks (F.H.D.). Scale Hill Woods (G.A.K.H.). Beaumont (N.J.).

Nudaria mundana, L. Very common in 1929 at Buttermere and Wasdale; did not see it in 1928 (G.A.K.H.).

- Euchelia** (**Hipocrita**) **jacobaeae**, L. Abundant at Beckfoot (F.H.D.). One male taken at Orton, May 25th, 1929. Not recorded at Orton since T. C. Heysham's record (H.D.F.).
- Nemeophila** (**Diacrisia**) **russula**, L.; **sanio**, L. Two male specimens at Cumwhitton Moss, 2, vii., 1918 (G.B.R.) Buttermere (G.A.K.H.).
- N.** (**Parasemia**) **plantaginis**, L. Common on mountains at Buttermere. Var. **hospita**, Schiff, on Robinson (G.A.K.H.).
- Orgyia antiqua**, L. Beaumont, one taken as late as September (N.J.).
- Trichiura crataegi**, L. One taken at Thursby, September 16th, 1932 (H.D.F.). Beaumont (N.J.).
- Poecilocampa populi**, L. Beaumont (N.J.). Buttermere (G.A.K.H.).
- Bombyx** (**Lasiocampa**) **quercus**, L.; var. **callunae**, Palmer. Common at Buttermere (G.A.K.H.). var. **olivacea**, Tutt. One taken at Orton, July, 1923 (H.D.F.).
- Saturnia pavonia**, L.; **carpini**, Schiff. Common on heath clad mountains at Buttermere (G.A.K.H.).
- Drepana lacertinaria**, L. At Beaumont (N.J.). Scale Woods (G.A.K.H.).
- Cilix glaucata**, Scop. Common at Buttermere (G.A.K.H.) Beaumont (N.J.).
- Lophopteryx** (**Odontosia**) **carmelita**, L. One pupa near Thursby, 1921, three pupae 1922; of these latter one held over till 1924 (H.D.F.).
- Notodonta ziczac**, L. Orton, larvae taken (F.H.D.).
- N.** (**Drymonia**) **chaonia**, Hb. Taken at Buttermere (G.A.K.H.).
- Pygaera pigra**, Hufn. At Kingmoor, larvae in spun-leaves of dwarf sallow (F.H.D.).

THYATIRIDAE.

- Cymatophora** (**Palimpsestis**) **duplaris**, L. Abundant in Scale Woods, in 1928 (G.A.K.H.).
- C. or**, F. Tarn Lodge, 19, vi., 1930, one specimen (G.B.R.).

C. (Polyploca) flavicornis, L. Fairly common at Buttermere (G.A.K.H.). Beaumont (N.J.).

Asphalia (Polyploca) ridens, F. Twice taken in Scale Woods (G.A.K.H.).

NOCTUIDAE.

Bryophila perla, F. St. Bees, Seascale, common (F.H.D.). Heads Nook (G.B.R.).

Demas coryli, L. Bred from a larva taken at Beaumont, 20, x., 1920 ; emerged 10, v., 1921 (N.J.).

Nonagria arundinis, F. ; **typhae**, Esp. Cumwhinton Brick Ponds (F.H.D.). Very common at Orton as larvae and pupae (H.D.F.).

Axylia (Graphiphora) putris, L. Rare, one specimen at Tarn Lodge taken on wing, 4, vii., 1930, only taken seven specimens previously (G.B.R.). Common at light at Thursby, previously recorded as scarce (H.D.F.). Fairly common at Buttermere (G.A.K.H.).

Mamestra (Hama) furva, Hb. Taken at Buttermere (G.A.K.H.).

Stilbia anomala, Haw. Buttermere and Great Gable (G.A.K.H.).

Agrotis suffusa, Hb. ; **ypsilon**, Rott. Buttermere (G.A.K.H.).

A. (Peridroma) saucia, Hb. Rare, one specimen, 30, ix., 1932 ; only five specimens taken previously (G.B.R.). One at Thursby, 16, ix., 1918 (H.D.F.).

A. (Euxoa) corticea, Hb. One at Thursby, 20, viii., 1922 (H.D.F.).

A. (Euxoa) cursoria, Bork. One at Silloth, September, 1922 (H.D.F.).

A. (Hapalia) praecox, L., One at Silloth, September 6th, 1922, and a second seen (H.D.F.).

Noctua (Graphiphora) glareosa, Esp. Buttermere (G.A.K.H.). Some years commonly at Tarn Lodge (G.B.R.). Beaumont (N.J.).

- N. depuncta**, L. One at Thursby, 31, vii., 1923, now extremely rare (H.D.F.). In 1890 I took one specimen at Hayton, twelve at Tarn Lodge, July, 1893, and one at same place, August, 1895 (G.B.R.).
- N. rubi**, View. Buttermere (G.A.K.H.).
- Triphaena ianthina**, Esp. Buttermere (G.A.K.H.). Beaumont (N.J.).
- Pachnobia** (**Taeniocampa** and **Triphaena**) **rubricosa**, F. Fairly common at Buttermere (G.A.K.H.).
- Taeniocampa** (**Monima**) **opima**, Hb. Three taken at Thursby, in April, 1913, one in April, 1918, one var. **brunnea**, Tutt., April 18th, 1919; five specimens in all (H.D.F.).
- T. (Monima) munda**, Esp. Four specimens, Thursby, March, 1918, 1922, April, 1919, pupae fairly common at Wreay, from which var. **geminatus**, Haw., and var. **immaculata**, St McGr., have been obtained (H.D.F.). I have taken altogether twelve specimens at Tarn Lodge (G.B.R.).
- T. (Monima) gracilis**, F. Fairly common, Buttermere (G.A.K.H.).
- Dyschorista fissipuncta**, Haw. Two at Thursby, 30, vii., 1919, and 15, viii., 1927 (H.D.F.).
- Xanthia** (**Cirrhia**) **citrago**, L. Many specimens taken at sugar at Tarn Lodge from August 25th to September 10th, 1932 (G.B.R.).
- Cirrhoedia** (**Atethmia**, **Orthosia**) **xerampelina**, Hb. One at Rose Castle, 19, viii., 1918; another at Cummersdale, 23, viii., 1918 (H.D.F.).
- Polia chi**, L. Particularly common in Carlisle, in August, 1932, several var. **olivacea**, Steph., taken (F.H.D.). Very common on walls at Buttermere (G.A.K.H.). Beaumont (N.J.).
- Cleoceris** (**Bombycia**, **Polia**) **viminalis**, F. Larvae common on sallow at Kingmoor near Carlisle, in 1932 (F.H.D.).
- Agriopis** (**Polia**) **aprilina**, L. Buttermere (G.A.K.H.).
- Aplecta** (**Eurois**, **Agrotis**) **occulta**, L. One specimen at sugar, 24, vii., 1932. I have only taken five specimens previously (G.B.R.).

- Hadena** (**Eumicthis**, **Polia**) **adusta**, Esp. Buttermere (G.A.K.H.).
- H.** (**Mamestra**, **Melanchra**) **dentina**, Esp. Common at Buttermere (G.A.K.H.).
- H.** (**Mamestra**, **Melanchra**) **pisi**, L. Common at Buttermere (G.A.K.H.). Beaumont (N.J.).
- Calocampa** (**Polia**) **vetusta**, Hb. One specimen at sugar 2, x., 1932; one at Sallow, 31, iii, 1933; only four specimens previously (G.B.R.).
- Xylocampa** (**Polia**) **areola**, Esp. At Heads Nook, two specimens, 15, iv., 1930; 2, iv., 1932 (G.B.R.). Beaumont (N.J.).
- Asteroscopus** (**Brachionycha**) **sphinx**, Hufn.; **cassinea**, Hb. Males and females not uncommon in a wood near Thursby, which is now cut down (H.D.F.).
- Habrostola** (**Abrostola**) **tripartita**, Hufn.; **urticae**, Hb. Common at Buttermere (G.A.K.H.). Beaumont (N.J.).
- H.** **triplasia**, L. Buttermere (G.A.K.H.). Beaumont (N.J.).
- Plusia** **chrysis**, L. Common at Buttermere (G.A.K.H.). Beaumont, (N.J.).
- P.** **bractea**, F. Three specimens at Thursby, July, 1913; July, 1920; July, 1929 (H.D.F.).
- P.** **festucae**, L. Buttermere (G.A.K.H.). Beaumont (N.J.).
- P.** **moneta**, F. One specimen at Thursby, 10, vii., 1931 (H.D.F.). One at Blackwell, 14, vii., 1933 (E. Blezard).
- P.** **interrogationis**, L. Common at Buttermere (G.A.K.H.).
- Anarta** (**Melanchra**) **myrtilli**, L. Very common locally at Grassmoor (G.A.K.H.). Beaumont (N.J.).
- Phytometra** (**Prothymnia**, **Eustrotia**) **viridaria**, Clerck. Loweswater (G.A.K.H.). Beaumont (N.J.).
- Euclidia** **mi**, Clerck. Locally common. Rannerdale (G.A.K.H.). Beaumont (N.J.).
- Tholomiges** **turfosalis**, Wk.; **humidalis**, Dbl. Wasdale (G.A.K.H.).
- Brephos** **parthenias**, L. Scale Woods (G.A.K.H.). Durdar, April 14th, 1933 (F.H.D.). Broad Street, Carlisle, April 1933 (N.J.).

GEOMETRAE.

- Venilia** (*Pseudopanthera*) **maculata**, L. ; **macularia**, L. Locally abundant, Scale Hill Wood (G.A.K.H.).
- Ellopia** (*Hylaea*, *Metrocampa*) **prosapiaria**, L. Locally very common (G.A.K.H.). Beaumont (N.J.).
- Pericallia** (*Hygrochroa*) **syringaria**, L. One specimen at Thursby, 10, vii., 1932 (H.D.F.).
- Odontopera** (*Gonodontis*) **bidentata**, Clerck. Common at Buttermere (G.A.K.H.). Beaumont (N.J.).
- Crocallis** (*Gonodontis*) **elinguaria**, L. Buttermere (G.A.K.H.). Beaumont (N.J.).
- Himera** (*Colotois*) **pennaria**, L. Common at Buttermere (G.A.K.H.). Beaumont (N.J.).
- Phigalia** (*Apocheima*) **pedaria**, F. One specimen at light in Heads Nook Post Office, 25, i., 1930 ; another at Tarn Lodge, 28, i., 1930, both males. These are the melanic form ab. **monacharia**, Staud. This is the first record of melanic specimens in the County ; the localities are three miles apart (G.B.R., Entom., lxiii., p. 86). Buttermere (G.A.K.H.).
- Amphidasys** (*Pachys*, *Biston*) **strataria**, Hufn. Buttermere, very common in 1930, coming freely to light (G.A.K.H.). Thursby, two at light, and three at rest on trees (H.D.F.).
- Tephrosia** (*Ectropis*) **biundularia**, Esp. ; **crepuscularia**, Hb. Buttermere, abundant (G.A.K.H.).
- T. bistortata**, Goeze (**crepuscularia**, Dup.). One female taken April 5th, 1933, Tarn Lodge (G.B.R.).
- Pseudoterpna** **pruinata**, Hufn. Wasdale (G.A.K.H.). Beaumont (N.J.).
- Iodis** (*Euchloris*) **lactearia**, L. Locally common at Scale Hill Woods (G.A.K.H.).
- Venusia** **cambrica**, Curt. Rosthwaite (G.A.K.H.). Beaumont (N.J.).
- Acidalia** (*Ptychopoda*) **aversata**, L. Common at Buttermere (G.A.K.H.).

- Bapta** (*Pseudopanthera*) **temerata**, Hb. Locally common at Scale Woods (G.A.K.H.).
- Semiothisa** **liturata**, Clerck. Very common locally at Scale Woods (G.A.K.H.). Beaumont (N.J.).
- Hybernia** (*Theria*) **rupicaprararia**, Hb. Buttermere (G.A.K.H.).
- H.** **leucophaearia**, Schiff. Locally common, Buttermere (G.A.K.H.).
- Hybernia** **aurantiaria**, Esp. Buttermere (G.A.K.H.). Beaumont (N.J.).
- Cheimatobia** (*Operopthera*) **boreata**, Hb. A large and distinctive **Cheimatobia** at first thought to be this species was to be found in Torkin Wood, Thursby. However I submitted specimens of these to Mr. Louis B. Prout, in 1930, who, after careful examination, found them to be a large and unusual form of **C. brumata**, L. (H.D.F.). **C. boreata**, Hb. Very common at Buttermere (G.A.K.H.).
- Oporabia** (*Asthena*) **autumnata**, Bork. Fairly common at Buttermere (G.A.K.H.).
- Malenydris** (*Xanthorhoe*) **salicata**, Hb. Common at Buttermere (G.A.K.H.).
- Entephria** (*Hydriomena*) **caesiata**, Lang. Very common on mountains, and locally common in valley, Scale Woods (G.A.K.H.).
- Amoebe** (*Xanthorhoe*) **olivata**, Fairly common at Rosthwaite (G.A.K.H.). Beaumont (N.J.).
- Perizoma** (*Hydriomena*) **albulata**, Schiff. Was double brooded in 1929, the second brood appearing in September (G.A.K.H.).
- P.** (*Hydriomena*) **bifasciata**, Haw.; **unifasciata**, Haw. One at Thursby, 4, viii., 1920 (H.D.F.).
- C.** (*Hydriomena*) **blandiata**, Schiff.; **adaequata**, Bork. Buttermere (G.A.K.H.).
- Eupithecia** **pulchellata**, St. Buttermere (G.A.K.H.).
- E.** **plumbeolata**, Haw. Buttermere, common in water meadows (G.A.K.H.).

- E. helveticaria**, Bdv. Rosthwaite (G.A.K.H.).
- E. satyrata**, Hb. Very common on grassy slopes, Buttermere and Scale Hill (G.A.K.H.).
- E. castigata**, Hb. Very common, Buttermere (G.A.K.H.).
- E. pusillata**, F. Locally common in Scale Woods (G.A.K.H.).
- E. nanata**, Hb. Buttermere, very common among heather (G.A.K.H.).
- E. lariciata**, Frr. Very common locally, Scale Woods (G.A.K.H.).
- E. abbreviata**, St. Buttermere, very common in oak woods (G.A.K.H.).
- E. (Gymnoscelis) pumilata**, Hb. Five specimens taken, first brood, Orton, 26, iv., 1920, 23, v., 1932. Second brood, Thursby, 17, viii., 1920, 27, vii., 1921; 6, ix., 1924 (H.D.F.). Fairly common at Buttermere and Rosthwaite (G.A.K.H.).
- Lobophora (Trichopteryx) viretata**, Hb. Scale Hill (G.A.K.H.).
- L. (Trichopteryx) carpinata**, Bork. Locally common at Scale Wood (G.A.K.H.).
- Hydriomena ruberata**, Frr. Buttermere, locally common, larvae on *Vaccinium* in June, moths emerged the same year in July. I have never seen the imago in wild state (G.A.K.H.).
- Xanthorhoë (Plemyria) rivata**, Hb. Buttermere (G.A.K.H.).
- X. (Plemyria) galiata**, Hb. Buttermere (G.A.K.H.).
- Anticlea (Hydriomena) nigrofasciaria**, Gozč. Fairly common, Buttermere (G.A.K.H.).
- Coremia (Xanthorhoë) munitata**, Hb. Common at Buttermere (G.A.K.H.).
- C. (Xanthorhoë) designata**, Hufn. Common at Buttermere (G.A.K.H.).
- C. (Xanthorhoë) ferrugata**, Clerck. Common at Buttermere (G.A.K.H.).
- C. (Xanthorhoë) unidentaria**, Haw. Buttermere (G.A.K.H.).
- Triphosa (Hydriomena) dubitata**, L. Buttermere (G.A.K.H.).
Beaumont (N.J.).

- Eucosmia** (**Calocalpe**) **undulata**, L. Beaumont, two specimens, 27, vii., 1927 (N.J.).
- Cidaria** (**Hydriomena**) **siterata**, Hufn. A rare species with me; one specimen 14, xii., 1931 (G.B.R.).
- C.** (**Hydriomena**) **miata**, L. Buttermere, very common (G.A.K.H.)
- C.** (**Hydriomena**) **corylata**, Thunb. Very common locally, Scale Woods (G.A.K.H.).
- Lampropteryx** (**Cidaria**, **Hydriomena**) **suffumata**, Hb. Very common, Buttermere (G.A.K.H.). ab. **piceata**, St. One specimen at Thursby, 18, v., 1924 (H.D.F.).
- Lygris** (**Eustroma**) **testata**, L. Common, Buttermere (G.A.K.H.). Beaumont (N.J.).
- L.** (**Eustroma**) **populata**, L. Buttermere, very common, often abundant (G.A.K.H.). Ab. **musauria**, Frr. Six specimens taken at Orton between 1919 and 1932 (H.D.F.).
- Cidaria** (**Hydriomena**) **pyraliata**, F.; **dotata**, L. Buttermere, fairly common (G.A.K.H.).
- Ortholitha** (**Xanthorhoë**) **cervinata**, Schiff. Beaumont, three specimens, 9, ix., 1926 (N.J.).
- Anaitis** (**Eucestia**) **plagiata**, L. Buttermere (G.A.K.H.).
- Odezia** **atrata**, L. Buttermere, very common amongst bracken (G.A.K.H.).

The following should be deleted from Thursby records and Carlisle district records in Vol. III. of Transactions (H.D.F.) :—

- Ennomos quercinaria**, Hufn ;
- Aspilates** (**Crocota**) **ochrearia**, Ross. ;
- Eupithecia** (**Eucymatoge**) **scabiosata**, Bork. ;
- E.** **dodoneata**, Guen. ;
- Thera** (**Hydriomena**) **juniperata**, L. ;
- Xanthorhoë** (**Plemyria**) **rivata**, Hb.
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The following records are from the Rev. G. A. K. Hervey's list unless otherwise stated :—

PYRALIDES.

- Scoparia dubitalis**, Hb. Buttermere, very common, often abundant on hill-sides.
- S. murana**, Curt. Buttermere.
- S. mercurella**, L. ; **frequentella**, Sta. Buttermere, common.
- S. truncicolella**, Sta. Buttermere and Wasdale.
- Nomophila noctuella**, Schiff. ; **hybridalis**, Hb. Common at Buttermere.
- Pyrausta purpuralis**, L. Local and fairly common, Whiteless Pike.
- Herbula (Pyrausta) cespitalis**, Schiff. Common at Buttermere.
- Ennychia (Pyrausta) cingulata**, L. ; **cingulalis**, Schiff. Fairly common locally at Rannerdale Knotts.

CRAMBI.

- Crambus pascuellus**, L. Very common locally in marshes at Buttermere.
- C. furcatellus**, Zett. Buttermere, very common locally on mountains over 2,000 feet.
- C. margaritellus**, Hb. Locally common in marshes at Wasdale.
- C. perlellus**, Scop. Buttermere.
- C. hortuellus**, Hb. Buttermere, very common.

ANERASTIIDAE.

- Ephestia elutella**, Hb. Buttermere, common in houses.

TORTRICES.

- Tortrix (Cacoecia) podana**, Scop. Wasdale.
- T. (Cacoecia) xylosteana**, L. Buttermere.
- T. (Pandemis) heparana**, Schiff. Buttermere.
- T. (Pandemis) ribeana**, Hb. Buttermere and Wasdale.
- T. viburniana**, F. Buttermere, very common on mountains.

- T. (Eulia) ministrana**, L. Very common locally, Scale Woods.
- T. forsterana**, F. Locally common, Scale Woods.
- Amphisa (Philedone) prodromana**, Hb. ; **walkerana**, Curt. Buttermere, locally common on mountains.
- Leptogramma (Peronea) literana**, L. Rare species with me, one at Tarn Lodge, 21, ix., 1929 ; another in wood at Heads Nook Railway Station, 21, iv., 1929 (G.B.R.).
- Peronea variegana**, Schiff. Buttermere, Beaumont (N.J.).
- P. ferrugana**, Schiff. Scale Woods, common.
- P. caledoniana**, Steph. Buttermere, very common on mountains; often abundant.
- P. aspersana**, Hb. Buttermere, taken in 1910. Beaumont (N.J.).
- Dictyopteryx (Peronea) contaminana**, Hb. Buttermere.
- D. loeflingiana**, L. A fine form at Beaumont, 12, vi., 1926 (N.J.).
- Argyrotoxa conwayana**, F. Fairly common at Buttermere.
- Penthina (Argyroploce) betulaetana**, Haw. Locally common, Scale Woods.
- P. (Argyroploce) pruniana**, Hb. Common at Buttermere.
- Pardia (Eucosma) tripunctana**, Schiff. Buttermere.
- Sericoris (Argyroploce) urticana**, Hb. Locally common, abundant among *Vaccinium* at Scale Hill, in 1928, the leaves being stripped by the larvae over a considerable area.
- S. (Argyroploce) lacunana**, Dup. Buttermere, very common up to 2,500 feet.
- Mixodia (Argyroploce) schulziana**, F. Buttermere, very common on mountains.
- Cnephasia (Tortrix) musculana**, Hb. On Red Pike.
- Sciaphila (Cnephasia) incertana**, Tr. ; **subjectana**, Gn. Matterdale.
- S. (Cnephasia) virgaureana**, Tr. Very common locally at Matterdale.
- Capua favillaceana**, Hb. Very common locally, Scale Hill Woods, Scale Woods and Rosthwaite.

- Phoxopteryx** (*Ancylis*) *myrtilana*, Tr. Buttermere, common amongst *Vaccinium*.
- Grapholitha** (*Eucosma*) *ramella*, L. Locally common at Matterdale, Beaumont (N.J.).
- G.** (*Eucosma*) *nisella*, Clerck. Buttermere.
- G.** (*Acrolita*) *naevana*, Hb. Whiteless Pike.
- Phloeodes** (*Eucosma*) *tetraquetrana*, Haw. Buttermere, abundant in birch woods.
- Poedisca** (*Eucosma*) *corticana*, Hb. Buttermere.
- P.** (*Eucosma*) *solandriana*, L. Buttermere and Rosthwaite.
- Ephippiphora** (*Eucosma*) *pflugiana*, Haw. Buttermere, fairly common.
- Coccyx** (*Pammene*) *splendidulana*, Gn. At 2,000 feet on Causey Pike, unusual habitat.
- C.** (*Pammene*) *argyrana*, Hb. Very common locally at Scale Woods.
- C.** (*Eucosma*) *taedella*, Clerck. Buttermere, locally abundant.
- Heusimene** (*Pammene*) *limbriana*, Haw. Scale Woods.
- Stigmonota** (*Pammene*) *regiana*, Zell. Buttermere.
- Dichrorampha** (*Hemimene*) *plumbana*, Scop. Buttermere.
- Catoptria** (*Eucosma*) *cana*, Haw. Buttermere and Matterdale.
- Symaethis** *oxycanthella*, L.; *fabriciana*, L. Buttermere, fairly common.
- Eupoecilia** (*Phtheochroa*) *maculosana*, Haw. Very common at Buttermere.
- Argyrolepis** (*Phalonia*) *badiana*, Hb. Buttermere.
- Aphelia** (*Cnephasia*) *osseana*, Scop.; *pratana*, Hb. Buttermere, abundant on mountains.
- Tortricodes** *hyemana*, Hb.; *tortricella*, Hb. A large colony on Causey Pike over 2,000 feet, apparently associated with either *Empetrum* or *Vaccinium*. The area was very restricted only measuring about 100 yards each way.

TINEAE.

- Diurnea** (*Chimabache*) **fagella**, F. Common in wood near Heads Nook Railway Station, melanic forms predominated over light forms in 1929 to 1931. In 1932 the species was rare there (G.B.R.). Buttermere, common in woods (G.A.K.H.).
- Scardia** (*Tinea*) **cloacella**, Haw. Buttermere.
- Blabophanes** (*Monopis*) **rusticella**, Hb. Buttermere, fairly common.
- Tinea** **pellionella**, L. Buttermere.
- T. fuscipunctella**, Haw. Buttermere.
- Tineola** **biselliella**, Hml. Buttermere.
- Incurvaria** (*Lampronia*) **oehlmanniella**, Tr. Very common among *Vaccinium* at 2,000 feet, at Buttermere.
- Micropteryx** **seppella**, F. ; **aruncella**, Scop. Buttermere.
- M. aureatella**, Scop. ; **allionella**, F. Buttermere, fairly common.
- M. (Eriocrania)** **purpurella**, Haw. Very common in Scale Woods (woods West of Buttermere Lake).
- M. (Mnemonica)** **semipurpurella**, Steph. Very common in Scale Woods.
- M. (Mnemonica)** **unimaculella**, Zett. Buttermere.
- M. (Mnemonica)** **subpurpurella**, Haw. Very common at Buttermere.
- Nemophora** **swammerdamella**, L. Common at Buttermere.
- N. schwarziella**, Zell. Buttermere, abundant, especially among *Vaccinium* at 1,000 feet.
- Adela** **viridella**, Scop. Buttermere, very common.
- Swammerdamia** **combinella**, Hb. Scale Woods.
- Prays** **curtissellus**, Don. Common at Buttermere.
- Plutella** **porrectella**, L. Common at Buttermere.
- P. dalella**, Sta. Buttermere.
- Cerostoma** **radiatella**, Don. Buttermere, very common in oak woods.

- C. costella**, F. Buttermere.
- Harpipteryx (Cerostoma) xylostella**, L. Common at Buttermere.
- Phibalocera (Carcina) quercana**, F. Rosthwaite. Beaumont (N.J.).
- Depressaria umbellana**, Steph. Buttermere.
- D. arenella**, Schiff. Buttermere.
- D. applanata**, F. Buttermere, very common.
- D. ciliella**, Sta. Buttermere.
- Gelechia ericetella**, Hb. Buttermere, common among heather.
- G. longicornis**, Curt. Fairly common at Whiteless Pike.
- Bryotropha (Gelechia) terrella**, Hb. Common at Buttermere.
- B. (Gelechia) politella**, Sta. Buttermere, on mountains up to 1,500 feet, and at Wasdale.
- Teleia (Telphusa) proximella**, Hb. Buttermere, very common in birch woods.
- Monochroa (Aristotelia) tenebrella**, Hb. Common at Buttermere.
- Pleurota bicostella**, Clerck. Buttermere, common on mountains.
- Dasycera sulphurella**, F. Buttermere.
- Oecophora (Borkhausenia) fuscescens**, Haw. Buttermere, very common at light.
- Glyphipteryx thrasonella**, Scop. Buttermere, very common in marshes.
- Argyresthia conjugella**, Zell. Buttermere, fairly common.
- A. retinella**, Zell. Abundant at Buttermere.
- A. pygmaeella**, Hb. Common at Buttermere.
- A. goedartella**, L. Common at Buttermere.
- A. brockeella**, Hb. Very common at Buttermere.
- Gracilaria elongella**, L. One specimen at Tarn Lodge, 24, viii., 1933 (G.B.R.).
- Ornix guttea**, Haw. Beaumont, 16, vi., 1925 (N.J.).
- Ocnerostoma piniariella**, Zell. Scale Woods.
- Coleophora discordella**, Zell. Buttermere.

- C. caespititiella**, Zell. Buttermere, among rushes.
Elachista apicipunctella, Sta. Buttermere, common in marshes.
E. albifrontella, Hb. Buttermere, common in marshes.
E. atricomella, Sta. Buttermere.
E. kilmunella, Sta. Matterdale.
E. nigrella, Haw. Very common locally on Pillar Mountain at 2,500 feet, and Rannerdale Knotts.
E. obscurella, Sta. Whiteless Pike.
E. biatomella, Sta. Buttermere.
E. rufocinerea, Haw. Loweswater.
E. subalbidella, Schl. Honister.
Lithocolletis faginella, Zell. Very common at Loweswater, less so at Buttermere.
L. spinolella, Dup. Common at Buttermere and Rosthwaite.
L. quercifoliella, Zell. Abundant at Buttermere.
L. cramerella, F. Common at Buttermere.
Opostega salaciella, Tr. Buttermere.
Nepticula floslactella, Haw. Common at Buttermere.
N. argentipedella, Zell. Scale Woods.
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The following species were taken by the Rev. G. A. K. Hervey in the Lake District of Westmorland and North Lancashire but have not yet been recorded for Cumberland :—

- Crambus dumetellus**, Hb. Grasmere, in 1909.
Paedisca (Eucosma) ratzeburgiana, Rtz. Grasmere.
Argyresthia dilectella, Zell. Locally common at Coniston and Tarn House.
A. aurulentella, Sta. Locally common at Grasmere.
Elachista subnigrella, Dougl. Locally common at Red Screes.